Why Doesn't Latin America Grow More, and What Can We Do About It?*

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1 Introduction

In 2004, Latin America and the Caribbean grew 6 percent, the highest rate since 1980. And the party is not over yet. In its most recent report dated August 2005, the United Nations Economic Commission for Latin America (ECLAC) forecasted that Latin America and the Caribbean will grow 4.3 percent in 2005. For 2006, ECLAC is forecasting 4 percent growth. If these predictions come true, the region would complete 4 consecutive years of growth, accumulating an increase of 10 percent in income per capita between 2003 and 2006. So after nearly a decade beginning with the Mexican crisis of 1994, when talk of stagnation dominated the headlines, growth is back.

ECLAC is not alone in its optimism. Earlier, in its World Economic Outlook dated April 2005, the International Monetary Fund had predicted 4.1 percent for Latin America in 2005, and 3.7 percent in 2006. The Fund writes that "the strength of the recovery in Latin America has continued to exceed expectations." (p. 37)

That Latin America should be growing at a time of record high commodity prices, record low international interest rates, and robust global demand, is not surprising. What is surprising is that the region is not growing more in this environment of the fastest world growth in 30 years. Indeed, according to the same IMF World Economic Outlook, the region will post the slowest average growth in 2005-06 of any developing region. Developing Asia will grow by 7.4 and 7.1 in each of those two years, according to the Fund. Even Africa, at 5.1 and 5.4 percent, will amply outgrow Latin America. And this is even though recent Latin growth is overstated by the ongoing recoveries in Argentina, Uruguay and Venezuela, countries that experienced large absolute declines in output earlier this decade.

Politicians and citizens all over Latin America would like to think that the recent expansion is the beginning of a new period of sustained growth. But the opposite may well be true: 2003-06 could be a passing blip in an otherwise mediocre growth performance. Yes, for Latin America has not grown that much, in spite of the wide-ranging reforms applied in most countries beginning in the late 1980s. To see the point, focus on the data set compiled by Blyde and Fernández Arias (2004). They assembled a sample of 73 countries, of which 20 are from Latin America and 53 from the rest of the world (20 of them belong to developed countries and 5 to East Asia).[1]

[1]Data is taken from the Penn World Table 5.6 and supplemented by other sources. See

The summary measure of economic performance is the growth rate of real (PPP-adjusted) GDP per capita. Regional performances are given by the simple (un-weighted) averages across countries in a given group to account for the growth experience of the typical country.

Figure 1 presents the annual growth rate of GDP per capita for the typical Latin American country during the last four decades. The first observation is that in the 1990s average growth per capita in the region was a mere 1.2 percent. This obviously was better than the disastrous performance of the 1980s. But 1.2 percent growth is just a little better than half the growth rate the region enjoyed in the 1960s and 1970s. It was also below the growth rates in the 1940s and 1950s. The conclusion is clear: performance in the 1990s was poor when compared with Latin America's own growth record.

Nor was growth stellar when compared to that of other regions of the world. Figure 2, also based on the Blyde and Fernández Arias data set, shows per capita growth of Latin America, the OECD and East Asia by decades, starting with the 1960s. Latin America grew more slowly than emerging Asia in each of the four decades from 1960 to 1999, and more slowly than the OECD in every decade but the 1970s, when the rich countries were under the effects of the two successive oil shocks.

Performance in the 1990s, it also seems fair to say, was mediocre compared to expectations at the beginning of the decade. Reformers argued, persuasively, that growth was being held back by distortions. Many of the distortions were government induced, the result of poorly conceived policies. Change policies and the economy will fulfill its potential, was the oft-made argument. A decade later the view is less sanguine: with fewer bad-policy distortions, the Latin American economies grew in the 1990s at half the rate attained during precisely those decades when the allegedly distorting policies of import-substitution reached their peak: the 1960s and 1970s.

This paradoxical outcome applies not just to Latin America, but to the developing countries in general. After documenting that the average developing country stagnated in the 1980s and 1990s, Easterly (2001) concludes: "Zero per capita growth on average after major reforms is a disappointing outcome whatever the cause. As a result of the poor countries' stagnation, poor and rich countries' incomes diverged over 1980-98."

Why doesn't Latin America grow more? And what can be done about it? Those are the questions to which this paper attempts to provide tentative

Blyde and Fernández Arias (2004).

answers.

In Section 2 analyzes the region's growth experience through the by-now conventional lens of cross-country growth regressions, and highlights the limitations of that framework for answering the question of why reforms have not yielded a bigger growth payoff in Latin America. Section 3 then sketches the rudiments of an alternative approach –one that stresses the non-linearities in the relationship between policies and growth. The main conclusion of that section is that crafting growth promoting-policies requires identifying the most binding constraints to economic growth, and these constraints are likely to vary across countries and across time. The paper ends in Section 4 with some suggestions on how to undertake this very difficult task.

2 Slow growth: possible interpretations

How to understand Latin America's growth performance? Consider first the standard growth regression:

$$\begin{aligned}\text{Growth of log per capita income} \quad = \quad & \text{constant term} + \\ & \beta_y * \text{(log) initial income per capita} + \\ & \beta_e * \text{exogenous factors} + \\ & \beta_m * \text{macro and stabilization policies} + \\ & \beta_s * \text{structural factors and policies} + \\ & \beta_i * \text{quality of institutions}\end{aligned}$$

Variations on this regression have been run ad infinitum over the last 15 years, using cross country data that includes Latin America. Here I do not plan to re-enact those econometric exercises -which are subject to well-known technical caveats[2]– but simply to use the equation as an organizing device to consider alternative explanations for Latin America's growth performance.

2.1 Convergence

[2]See Levine and Renelt (1992), Jones (1995) and Rodriguez and Rodrik (2000), among many others.

The idea here is that -holding everything else equal- countries with a higher initial per capita income should grow more slowly as they all converge in the long run to the same per capita income.[3]

Even putting aside the theoretical and empirical doubts as to whether such convergence does take place (see Pritchett, 2001, for a contrarian view), it should be clear that this is not where the action is for Latin America. As we saw, the OECD, with a substantially higher per capita income, has almost invariably grown more quickly. East Asia had lower per capita income in the 1960s, but it long-ago surpassed Latin America -and continues to grow more quickly nonetheless. The same can be said for comparisons within Latin America. In the 1990s Chile was by far the fastest-growing country in the region, and it also happens to have one of the highest incomes per capita. And which was the slowest-growing country in that period? Haiti, which also happens to be the poorest.

2.2 Exogenous factors

The most important exogenous factor affecting growth in Latin America is the performance of the international economy. Easterly, Kremer, Pritchett, and Summers (1993) were among the first to show empirically that "good luck" in the form of favorable terms of trade shocks are as important as "good policies" in explaining growth performance over medium term horizons (e.g., decades). Unsurprisingly, in most cross country regressions some summary measure of external conditions -terms of trade is the one most commonly used- comes out strongly significant and quantitatively important. So do time dummies for decades. For instance, Loayza, Fajnzylber and Calderón (2002) find that the average country in their sample (which is world-wide) should grow almost 3 percentage points more slowly in the 1990s than in the 1960s purely on the basis of changed world conditions. This is a large effect. Easterly (2001) comes to the conclusion that the world growth slowdown after 1980 is partly responsible for the stagnation of developing countries in the last two decades in spite of policy reforms.

Focusing on the role of the international environment tempers somewhat the pessimism regarding the mediocrity of Latin America's recent growth performance. It is true that the region grew more slowly in the 1990s than

[3] Or to the same per capita income of nations with similar underlying parameters, in the case of conditional convergence.

in the 1960s and 1970s, but so did everybody else.[4]

Moreover, most but not all differences in performance shrank in the 1990s. Figure 3 shows Latin American growth relative to that of three comparator regions: East Asia, the developed countries of the OECD, and the rest of the world. In that figure we see that compared with the 1970s, the growth gap vis à vis East Asia and the rest of the world diminished, and the growth gap vis à vis the developed counties stayed roughly the same. Compared with the 1960, performance relative to East Asia worsened slightly, but relative to the other two regions it improved.

In short, during the 1990s Latin America's absolute growth performance was mediocre, but its relative performance was less bad than in previous decades, including periods such as the 1960s and early 1970s that are sometimes thought of as the "golden era" of Latin American growth. The point is important to keep in mind, lest we conclude that everything that happened in the 1990s was an unmitigated disaster.

That said, the sustained growth gap vis à vis East Asia and the OECD remains to be explained. And the fact that per capita growth remained lower than in the East Asia, the developed countries and the rest of the world meant that the income gap between Latin America and those 3 groupings of countries worsened. As Table 1 makes depressingly clear, in the 1960s Latin America had 31 percent of the per capita income of the developed countries; by the 1990s the figure had dropped to 20 percent. Vis a vis East Asia, the swing in the same period is sharper: from 128 percent to just 31 percent.[5]

2.3 Macro stabilization

Just as growth performance needs to be conditioned on the growth opportunities afforded by the world economy, it also needs to be conditioned on the quality of the policies in place. Start with macro policies and stabilization. No one doubts that a modicum of macroeconomic stability -consisting, for instance, of low inflation and no currency or banking crises- is a necessary condition for growth. As argued by Fischer (1993), a high rate of inflation is also a summary statistic for macroeconomic mismanagement. Latin America has been by far the region with the highest inflation rate in the past 30 to 40 years. Most empirical work, therefore, has focused on the impact of inflation

[4] Blyde and Fernández Arias (2004) stress this point

[5] Comparisons based on PPP income figures.

on growth. For instance De Gregorio (1992), using a five-year panel data for 12 Latin American countries between 1950 and 1985, found that high inflation was one of the two quantitatively most important factors inhibiting growth in Latin America.

What about the performance of the 1990s? Lowering inflation was one of the great successes of policy reform in the region. The average rate of inflation went from 495 percent in 1990 to 6 percent in 1999, and has remained in single digits since. This achievement seems to have had an impact on growth. De Gregorio and Lee (2004) estimate that higher inflation accounted for 0.55 percentage points per annum of the growth difference between East Asia and Latin America in the 1980s; for the 1990s this figure went down to 0.22 percentage points per annum.

But macro stability is not all about inflation. Along other dimensions performance was less successful -and on some counts outright disastrous. Historically output volatility has been extremely high in Latin America. In the 1990s volatility declined but remained high. Loayza et al (2004) compute the standard deviation of cyclical per capita output (that is, of deviations of per capita output around its estimated trend). This standard deviation fell from 0.0285 in the 1980s to 0.0165 in the 1990s. But two factors take away some shine from this performance. One is that in the 1990s all developing regions except for Eastern Europe reduced their volatility, so the change may have to do with international factors and not just with country- or region-specific policies. Another is that Latin America's volatility (measured by the standard deviation of per capita output) is still substantially higher than that registered in the same decade by the industrial countries.[6]

Why is output stubbornly volatile in Latin America? Repeated balance of payments crises are a central part of the story. Table 3, taken from de Gregorio and Lee (2004) lists what they define as crisis episodes in East Asia and Latin America since 1970.[7] According to this count, there were 14

[6] The figures refer to the median of the standard deviation in each group of countries. Results for the simple mean and the GDP-weighted average are slightly different, but they still tell pretty much the same story. See Loayza et al (2002).

[7] A balance-of-payments crisis is defined as an event when either a) a nominal currency depreciation of at least 25 percent in any quarter of a specific year and the depreciation rate exceeded that in the previous quarter by a margin of at least 10 percent; or b) an indicator of currency pressure for any month of that year exceeded three standard deviations above the mean of the indicator, provided that either the monthly nominal depreciation rate or percentage change of reserve loss exceeds 10 percent.

balance of payments crises in East Asia (2.3 per country) and 55 in Latin America (2.6 per country). In spite of the efforts at stabilization and reform, in the 1990s there were crises in Argentina, Brazil (twice), Colombia, the Dominican Republic, Ecuador (twice), El Salvador, Guatemala, Jamaica, Mexico, Peru, Trinidad Tobago and Venezuela. And this list, of course, leaves out the 21 century blowouts so far, in Argentina, Uruguay and the Dominican Republic.

These currency and financial crises have had massive output costs.[8] Loayza, Fajnzylber and Calderón (2002) estimate that a banking crisis can reduce by as much as 3 percent per year over a five-year period. According to De Gregorio and Lee (2004), a crisis reduces growth by 1.7 percent per year, also over a five-year period. De Gregorio and Lee estimate the output cost of a crisis by the cumulative loss in output growth from the year when the crisis began until the time when output growth returned to its trend. According to this measure, from 1970 to 1999 the output cost was about 8.9 percentage points on average for Latin American crises and about 10.4 percentage points for East Asian crises. For Latin America, the average cost of crisis declined from 11.0 percent in 1980s to 5.0 percent in 1990s, while for East Asia it increased from 7.7 percent in 1980s to 13.8 percent in 1990s. At first this seems to reflect well on Latin America, but it turns out that the bulk of the difference with East Asia in the 1990s follows from the much higher trend growth in the Asian economies.

It also seems that the patterns of recovery from crises have not been favorable in Latin America. Both De Gregorio and Lee (4004) and Sturzenegger et al. (2004) find that in Latin America recoveries have tended to be slow, while in Asia they were mostly V-shaped (deep collapse but also swift recovery).[9] Sturzenegger et al. (2004) stress that in East Asia the current account adjustment that accompanies a crisis if typically accomplished through export expansion, whereas in Latin America it is accomplished through import compression.

In short: it seems that a mediocre macro performance is inextricably linked to the mediocre growth performance of Latin America. But that cannot be the end of the story, since even countries that recently have managed to stabilize and follow more prudent macro policies -El Salvador and Mexico

[8] Also see Barro (2001).

[9] There were a few V-shaped recoveries in Latin America, however. Examples are Chile after 1982 and Mexico after 1994.

are two examples- have not grown a great deal. And even virtuous Chile, with its universally lauded macro policies, suffered a prolonged growth slowdown in the late 1990s and early 2000s. This suggest that other factors must also be at work. I consider some potential candidates next.

2.4 Structural reforms

The list of structural changes Latin American countries were called upon to carry out in order to increase their competitiveness and growth included trade liberalization, financial deregulation, tax reform, privatization, and labor market deregulation. How much of this was actually done? At first glance, quite a bit. Lora (2001) put together the most comprehensive measure of these 'structural policies'. Figure 4, taken from that paper, shows a great wave of reform taking place between 1985 and 1999. Lora's index of reform, calculated as an average for 17 countries in Latin America and the Caribbean, went from 0.34 to 0.58 in that period.[10] Change was fastest between 1989 and 1994 -an increase of 0.12 points took place out of a total of 0.24 for the entire period. Reforms slowed down after then, but in most countries there has been little backsliding, if any.

The advance of structural reform was uneven across the various categories. Two sets of structural changes -involving trade and finance- went farthest, with the relevant index rising by over 75 percent over the period. Two other sets of reforms -privatization and tax changes- are in an intermediate category, with the index rising around 25 percent in both cases. Finally, in labor market regulations –hiring and firing costs, non-wage costs, rules on overtime and part-time work– there has been hardly any change at all since the mid-1980s. Some countries, like Argentina, have attempted labor reform repeatedly, only to have bills defeated or passed in highly watered-down form. In others, such as Chile, firing costs have actually risen in the last 15 years.

Reforms were also uneven across countries. In Lora's reform index there is a large gap between Bolivia, the top reformer, whose reform index reached almost 0.7 by 1999, and laggard Uruguay, whose index stood at only 0.48. But even in conservative Uruguay there was non-trivial change, with the

[10] Lora (2001) computes region-wide indices in the five areas -trade, finance, taxation, privatization and labor-normalized so that zero is the lowest rating in any country at any time in the sample, and one the highest. Therefore the levels of the index are rather hard to interpret, but the changes in the index over time offer a good measure of change in these areas.

index rising from 0.37 to 0.48 between 1985 and 1999.

How much growth did all this reforming effort purchase? The question remains controversial, and empirical answers vary. But a growing number of studies seem to be saying the same: the growth payoff from reform was not large.

The prevailing view on the growth effects of reforms was very optimistic early on. Three papers representative of that view were Easterly, Loayza and Montiel (1997), Fernández-Arias and Montiel (1997) and Lora and Barrera (1997). These papers had a common methodology. The added policy variables or indices to the standard cross-country growth regressions and then, using the estimated coefficients and the values of the policy variables, computed a forecast of the growth impact of reform. Lora and Barrera (1997), for instance, using (an earlier version of) the indices of reform described above, argued that reforms applied until the mid-1990s had accelerated Latin America's growth rate by 1.9 percentage points (or up to 2.2 percentage points once the impact of macroeconomic stabilization policies was included). Easterly, Loayza and Montiel (1997) also estimated 2.2 percent, while the paper by Fernández-Arias and Montiel (1997) yielded a lower estimated of 1.6 -with the effect of macro stabilization included in these figures, so that the impact of structural reform alone was in fact smaller.

With the passage of time, however, this optimism has tended to wither. For one thing, using new data and methods, estimates of the growth impact of reform have fallen. For instance, Lora and Barrera (2001), using the updated reform index of Lora's (2001), found that (contrary to the claim in their own 1997 paper) reforms had only a temporary effect on growth. Their new estimates implied that in 1991-93, the period of fastest reform, reforms caused growth to accelerate by 1.3 percentage points per year. But when the reform process decelerated the growth effect dropped substantially, and in the period from 1997 to 1999 reforms accounted for only 0.6 percentage points of additional growth (relative to a situation in which no additional reforms had been undertaken).

Loayza, Fajnzylber and Calderón (2002) computed the contribution of a set of structural factors (education, financial depth, trade openness, public infrastructure, and the size of government) on the change in per capita growth between the 1980s and the 1990s. Their results, which appear in Table 4, are not of the sort that drives reform advocates wild with excitement. The contribution of structural factors to the growth change in the average Latin

American country between the dismal 80s and the so-so 1990s is 1.4 percent.[11] And this average is pulled up by high figures in countries such as Haiti (2.24), Nicaragua (2.56) and El Salvador (2.21) that were coming out of civil strife and economic chaos.[12]

Figures for nations that reformed extensively are sobering: Argentina (1.07), Bolivia (1.34), Brazil (0.88), Chile (1.67) and Mexico (1.51). In other words, moving away from the distorting, inward-looking and often chaotic policies of the 1980s seems to have given Argentina barely one additional point per year of growth in the 1990s.[13] And note that these are transitory, not permanent, gains: they are estimated for a neoclassical model, so the gains should vanish as the economy converges to its long run steady state in which only technological progress drives growth.

The other reason why optimism on the effects of reform on growth has been dwindling is that the impact of some individual reform items –once expected to be large– is awfully hard to find in the data. Take education, everybody's favorite growth factor. A huge literature exists showing that enrollment rates are robustly correlated with growth rates (Barro, 1991; Levine and Renelt, 1992). The justification for putting enrollment rates into growth regression is they are a proxy for the change of the stock of human capital of the labor force. But the enrollment rate is a valid proxy for the rate of accumulation of schooling across countries only if each country is roughly at its steady state –and this is obviously not true, since enrollment rates have increased massively since World War II.

Once you put measures of human capital on the right-hand side, the education-growth nexus tends to vanish. Mot famously, Pritchett (2001) constructed a measure of educational capital and used it to explain statistically the growth of both output and total factor productivity (TFP). His results are startling: the estimate of the impact of growth in educational capital on growth of per worker GDP is negative and insignificant; and the growth of educational capital shows a large, statistically very significant and negative effect on TFP growth.[14]

One possible retort is that Pritchett's measures (and almost everybody else's) capture only the quantity of educational attainment, while it is presumably the quality (or, more accurately, the product of both) that matters

[11] This figure, of course, includes reforming and non-reforming countries.

[12] Haiti never quite came out of that state, which makes the figure surprising

[13] The figure is from Loayza, Fajnzylber and Calderón (2002).

[14] Benhabib and Spiegel (1994) and Spiegel (1994) find similar results.

for growth.[15] But as Pritchett (2001) himself retorts, for quality differentials to explain his results, the stock of human capital would have to be negatively correlated with educational quality –a relationship for which there is no evidence.[16]

In another widely cited paper, Bils and Klenow (2001) build a model in which the ability to build on the human capital of one's elders plays an important role in linking growth to schooling. They calibrated the model to quantify the strength of the effect of schooling on growth by using evidence from the labor literature on Mincerian returns to education. Their main result: in the calibration, the impact of schooling on growth explains less than one third of the empirical relationship between years of schooling estimated by Barro (1991) and others. Moreover, the model suggests a channel of reverse causality, with expectations of higher growth leading to an increase in schooling. The bottom line again is that the causal link between education and growth is much weaker than conventional wisdom suggests.

So can we point to one policy or set of policies that can be relied upon to ignite growth? The answer so far is no. In fact, growth takeoffs seem only weakly related to policy changes and structural reforms. Hausmann, Pritchett and Rodrik (2004) define a growth acceleration as an increase in per-capita growth of 2 percentage points or more (with most of the episodes we identify exceeding this threshold by a wide margin). To qualify as an acceleration, the increase in growth has to be sustained for at least eight years and the post-acceleration growth rate has to be at least 3.5 percent per year.[17] Using this approach, they find that growth accelerations tend to be highly unpredictable: the vast majority of them are not preceded or accompanied by major changes in economic policies, institutional arrangements, political circumstances, or external conditions.[18] Economic reforms are certainly not irrelevant: they are a statistically significant predictor of

[15] There is also the thorny question of how to measure the quantity properly. As Urquiola and Calderón (2004) show, additional years in school are not the same as additional years of schooling.

[16] Put another way, differences in educational quality can account for heterogeneity in the impact of schooling, but not a low average impact of schooling on growth.

[17] In addition, to rule out cases of pure recovery, they require that post-acceleration output exceed the pre-episode peak level.

[18] Growth accelerations are also quite frequent. Hausmann, Pritchett and Rodrik (2004) identify more than 80 episodes of rapid acceleration in economic growth that are sustained for at least eight years. The unconditional probability that a country will experience a growth acceleration sometime during a decade is around 25 percent.

which growth accelerations are sustained. But the common idea that a major policy reform package is what gets growth started to begin with is nowhere to be confirmed in the data.

A last reason to be skeptical about the tightness of the relationship between policies and growth (or between policy reforms and growth accelerations) is that how bad the policy was initially matters. As Easterly (2004) has stressed recently, the estimated link seems to depend crucially on extreme values taken by policies (episodes of huge exchange rate overvaluation or black market premia, extremely high tariffs, etc.). He runs a set of cross country regressions in which he excludes "extreme" values of policies, and the results are striking: all policy variables in the regressions become insignificant. Easterly's interpretation is that getting rid of very bad policies has a big impact of growth, but that "moderate" changes in "moderate" policies are likely to have a small effect. This is an important point to which I return below.

2.5 Institutions

Data on institutional quality are controversial –they are based mostly on surveys, for one thing, so they reflect perceptions and not objective measures– but what there is does not show Latin America in a favorable light. Figure 5 shows the indices for law and order, absence of corruption and bureaucratic quality compiled by the International Country Risk Guide (ICRG). Predictably, Latin America lags behind the OECD and the emerging portions of Asia in all categories. Out of a maximum of 6 points, Latin America's average in 1984-93 was 2.34 to East Asia's 2.98. A decade (1994-2004) later, the average for both had risen –2.66 for Latin America, 3.34 for East Asia– with the gap between the two regions basically unchanged. Between the two decades Latin America improved in law and order and bureaucratic quality, but worsened slightly in the corruption category.

At one level the new focus on institutions must be right. In Sweden election boards count votes accurately, judges deliver even-handed justice, and tax agencies collect taxes due; in Nigeria often they not. All of this makes Sweden a better place to do business, and investment and growth are higher in Sweden than in Nigeria. None of this is surprising: having better institutions is almost synonymous with being richer and more developed.

Within Latin America the same point can be made. Chile comfortably tops all surveys that attempt to measure rule of law, the quality of regulation

and the presence or absence of corruption. Chile was also the fastest growing country in the region in the 1990s and has one of the highest GDPs per capita. It seems clear that better institutions and prosperity go and in hand.

If follows that if Guatemala wants to get rich it better get itself better institutions, right? Well, not quite. A first and fairly obvious objection is that correlation does not imply causation. Is Sweden rich because it has good institutions or does it have good institutions because it is rich? The answer is far from obvious.

An industry has developed within the economics profession to try to provide a statistically reliable answer to this vexing question. The name of the game is to find a good instrument for institutional quality -that is, an exogenous factor that plausibly has a causal impact on institutions but which itself is not correlated with income or growth. Hall and Jones (1999) and Dollar and Kraay (2002) use as instruments the fraction of the population speaking English and the fraction of the population speaking other European languages, which is sensible if you believe that good institutions follow somehow from English or (more generally) European cultural and political influence. Acemoglu, Johnson, and Robinson (2001) use mortality rates of colonial settlers as an instrument for institutional quality. They argue that settler mortality had an important effect on the type of institutions that were built in lands colonized by the main European powers. Where the colonizers encountered few health hazards, they allegedly erected solid institutions that protected property rights and established the rule of law. In other areas colonizers simply wanted to extract resources as quickly as possible, and therefore they did not attempt to build high-quality institutions.[19]

Once an instrument is found and applied, the expected result appears.[20] Institutional quality, properly instrumented for, appears to be a significant determinant of income levels (or growth rates, depending on which paper you focus on). For Latin America, the exercise has been carried out by De Gregorio and Lee (2004), among others. In their estimates, the lower score for Latin American countries relative to their East Asian counterparts in a rule of law index explains 0.37 percentage points per year of the gap growth between the two regions in the 1990s. And the greater prevalence of democracy in Latin America (also measured by an index) adds 0.27 percentage points per

[19] Frankel and Romer (1999) use gravity factors as instruments for that other endogenous variable of interest: trade openness or integration into the world economy

[20] Though that empirical strategy is not without caveats. See Dixit (2005).

year to the region's growth in the 1990s.[21]

Blyde and Fernández (2004) carry out a similar exercise, but attempting to explain productivity (TFP) growth rather than output growth. In their results, differences in the index of institutional quality explain 0.7 percentage points per year of the gap in productivity growth between Latin America and East Asia in 1995-99. And if the developed countries are the reference group, differences in institutional quality explain 1.1 percentage points of the TFP growth gap between the two regions in the same 5-year period.[22]

Moreover, once you control for institutions (properly instrumented for), the effect of policies seems to vanish. For instance, Rodrik, Subramanian and Trebbi (2002) show that controlling for institutions, measures of trade openness seem to affect per capital income via coefficients that are both negative (that is, they have the wrong sign) and mostly insignificant. Similarly, Acemoglu, Johnson and Robinson (2002) find that controlling for institutions, indicators of macroenomomic policy and performance become insignificant. This strengthens the apparent impact of institutions on growth, in that it suggests that regressors such as openness or inflation may have been acting as proxies for institutional quality in earlier empirical work.

So is this evidence enough to conclude that bad institutions that have held back growth in Latin America over the last two decades? The conclusion is tempting (and certainly fashionable), but two caveats are in order. One is that the estimated coefficients on institutional variables do not seem particularly large –at least when compared with the tremendous difficulty of institutional improvement. The estimates by Blyde and Fernández Arias (2004) cited above can be interpreted to say that if Latin America had the institutions of the average OECD nation then it would have grown a shade over one percent per year faster in the latter part of the 1990s. Multiply this by your preferred probability that Latin America will indeed have OECD-quality

[21] The rule-of-law index, expressed on a zero-to-one scale, with one being the most favorable, is based on the rule of law figures in the International Country Risk Guide. The democracy index, expressed on a zero-to-one scale, with one being the most favorable, is based on the indicator of political rights compiled by Freedom House. The deal with endogeneity by using lagged values of the regressor as instruments in a 2-Stage Least Squares estimation.

[22] They measure institutional quality by the first principal component of the International Country Risk Guide (ICRG) variables, which combines risk of repudiation of contracts by government, risk of expropriation, corruption, rule of law and bureaucratic quality. Like De Gregorio and Lee (2004), Blyde and Fernández Arias deal with endogeneity by using lagged values of the regressors

institutions any time soon, and the expected value of the whole undertaking does not seem tremendously large.

The second and most important caveat is that, as emphasized recently by Dixit (2005), all this literature says little or nothing about which institutions are actually good for growth, or how to build them. I defer that discussion until the closing section of the paper.

2.6 Growth predictions

If better policies and structural reforms were expected to endow Latin America with East-Asian rates of growth, that hope has not been realized. What's worse, prospects for future growth do not seem to be much better. Using their estimated coefficients plus trend-based-forecasts for the exogenous determinants of growth, Loayza, Fajnzylber and Calderón (2002) forecast that on a per capita basis the average country in East Asia should grow 3.78 per cent per annum in 2001-2010, while the average country in Latin America should grow 2.34 percent, for a gap of 1.44 percentage points. So if these estimates are right, the income gap between Latin America and the successful Asian economies will keep widening.

For a number of Latin countries, the per capita growth forecasts of Loayza, Fajnzylber and Calderón (2002) are disheartening: Argentina (1.52), Bolivia (1.58), Colombia (1.73) and Uruguay (1.43); for others they are terrifying: Haiti (-.59) and Venezuela (-.82). True, Brazil, Chile, Costa Rica, El Salvador, Mexico and Trinidad Tobago are forecasted to grow at more than 3 per cent per year in the first decade of the 21st century. But nearly half the decade has passed already, and none of these countries seems close to matching its forecast. Chile, for instance, is predicted to grow at 4 per cent per in per capita terms, but the average in 2000-04 was less than 2 percent. For the other countries with expected strong growth, the gap so far between forecast and performance is even larger.

De Gregorio and Lee carry out a similar exercise. They use results from cross-country regressions to construct forecasts of economic growth for individual countries. They obtain projected growth rates for 2001-2010 by multiplying 2000 values (or the 1995-99 period average) of explanatory variables by the estimated coefficients in the regression.[23] For the 21 Latin Ameri-

[23] Terms-of-trade shocks are assumed to be equal to those in the 1990s. They also assume no balance-of-payments crises.

can countries the predicted growth rate is estimated at 2.3 percent over the 2001-2010 period, higher than the average of 1.6 percent during the 1990s. The average growth rate for the East Asian region is predicted at 3.8 percent, which implies growth differential between two regions would shrink to 1.4 percentage points –a bit lower than the 1.9 percentage points over the 1990-2000 period, but still not a great mark of success.

2.7 Taking stock

The standard exercise for assessing whether Latin America's growth performance has been adequate goes like this. Take the coefficients from a cross-country growth regression. Next, plug in the actual values of the regressors for the country or for the whole region and compute the predicted growth rate. Then ask what share of actual performance is explained by the predicted values. If the actual growth rate was below the predicted one, performance is typically called "disappointing;" if above, authorities can congratulate themselves for their superior results.

An example of this type of exercise is provided by Blyde and Fernandez-Arias (2004), who focus on TFP growth and conclude: "According to the model, the relatively worse performance of Latin America with respect to all the other regions was the result of insufficient openness, macroeconomic mismanagement (proxied by the inflation rate) and worse institutions... The model is able to explain most of the observed gaps in TFP growth between Latin America and the comparators during the selected period. Specifically, the model (which includes openness, inflation, the quality of institutions, the convergence factor and the cyclical factor) explains 98 percent of the observed gap with respect to the rest of the world, 88 percent of the observed gap with respect to East Asia, and 74 percent of the observed gap with respect to the developed countries."

Loayza, Fajnzylber and Calderón (2002) also ask "Has Latin America and the Caribbean's growth performance in the aftermath of the reform process been disappointing?" And they answer: "For 80 per cent of the Latin American and Caribbean countries, the actual growth improvement between the 1980s and 90s was virtually equal or greater than the projected change in the growth rate according to the regression analysis. This leads to the conclusion that for the majority of countries in Latin American and Caribbean, the realized growth rate in the aftermath of the market-oriented reforms has not been disappointing: Controlling for non-policy factors, countries that re-

formed their economies the most experienced a correspondingly larger growth improvement in the 1990s."

Such exercises are informative. But a skeptic could raise at least three kinds of issues. A first and obvious one is that the value of the regressors may well be the "wrong ones" relative to some optimum reform level. If too low, "insufficient reform effort" is to blame. That being so, one cannot be disappointed if countries fail to grow.

A second and more fundamental objection is that –by construction– the regression coefficients represent the average value across a large and heterogeneous set of countries. As Helpman (2004) has stressed recently, there is no reason to expect that the marginal effect say, of policy i on growth, should be the same for the country in question as for the set of countries on average. This is not a problem if the objective is to analyze the effects of policies on average; but it is a problem if the objective is too extract policy lessons for a particular country. As Dixit (2005) has said: "The question policy prescribers must address is not 'What creates success on average across countries?' but 'What is going wrong in this country and how can we put it right?"'

A third objection is that the regression coefficients may be estimated poorly. A big concern, naturally, has been endogeneity. The discussion on endogeneity in growth regressions has focused on outcome variables such as investment and trade ratios, where the concern has been that such outcome variables may be caused by (or jointly determined with) incomes. More recently, Rodrik (2005) has emphasized that by their very logic policies must be endogenous, and that this endogeneity severely limits what cross-country regressions can tell us about the relationship between policy reforms and growth.

More closely related to the main argument of this paper is another econometric pitfall: non-linearity. The overwhelming majority of empirical exercises looks for a linear relationship between policies (or policy changes) and subsequent growth (or growth acceleration). But as Rogriguez (2005) emphasizes, there are two obvious limitations of using a linear framework to carry out that kind of evaluation: "In the first place, a linear framework rules out the possibility that the effect of a change in the variable of interest may differ according to the level taken by the variable. Consider for example the hypothesis that increases in tariff rates do not have much of an adverse effect on growth when starting from an initial level of relative openness, but that completely isolating an economy from world trade can be

very harmful to a country's capacity to sustain adequate living standards. Such a hypothesis would find no place in a linear growth regression. In the second place, the linear framework rules out the possibility that the effect of certain variables may depend on the levels of other variables (i.e., that the effect of openness may depend on whether the economy's initial comparative advantage lies in manufactures or in agricultural goods)." After conducting tests that decisively reject the linearity assumption, Rodriguez (2005) goes on to argue that absent linearity (and non-separability), standard estimates of the effects of policies on growth are quite unreliable.

Upon further reflection, the three objections turn out to be closely related. Insufficient reform effort is a favorite culprit. But what constitutes "sufficient" or "insufficient" reform effort can only evaluated in reference to the actual marginal effect on growth or some other welfare-related objective. But that judgement can only be made if we have reasonably accurate estimates of the country-specific marginal effect of policies. In turn, this task is rendered difficult by the fact that these effects almost surely depend on starting conditions and especially on pre-existing distortions, and that standard econometrics is poorly equipped to estimate these effects.

3 A model of growth and reform

This section sketches an alternative approach to the connection between policies and growth –one that takes head on the likely non-linearities and non-separability in this relationship. Begin with a simple model, which ideally could save a thousand words.

3.1 The simplest possible model of growth and reform

Consider the simplest possible model of growth and reform in a small open economy. All variables are in per capita terms. One domestic tradable good is produced, using capital k and two other tradable inputs denoted by m and n. Let output net of taxes, as perceived by the representative firm, be

$$\begin{aligned} y - p\tau_m m - q\tau_n n &= k^{\alpha}\left(m^{\frac{1}{\theta_m}}\bar{m}^{1-\frac{1}{\theta_m}}\right)^{(1-\alpha)\gamma}\left(n^{\frac{1}{\theta_n}}\bar{n}^{1-\frac{1}{\theta_n}}\right)^{(1-\alpha)(1-\gamma)} \\ &\quad -p\left(1+\tau_m\right)m - q\left(1+\tau_n\right)n, \end{aligned} \tag{1}$$

where $\bar{m}$ and $\bar{n}$ denote the aggregate or economy-wide levels of m and n, and p and q are the relative prices of m and n in terms of output (given to the

small open economy). Moreover, τ_m and τ_m are two tax distortions, $\theta_m \geq 1$ and $\theta_n \geq 1$ denote external effects, and α and γ are two positive coefficients between zero and 1.

This equation can be written as

$$\begin{aligned} y - p\tau_m m - q\tau_n n &= k\left(x^{\frac{1}{\theta_m}}\bar{x}^{1-\frac{1}{\theta_m}}\right)^{(1-\alpha)\gamma}\left(z^{\frac{1}{\theta_n}}\bar{z}^{1-\frac{1}{\theta_n}}\right)^{(1-\alpha)(1-\gamma)} \\ &\quad - \left\{p_m\left(1+\tau_m\right)x + p_n\left(1+\tau_n\right)z\right\}k, \end{aligned} \tag{2}$$

where $x = m/k$ and $z = n/k$. The representative firm maximizes profits by choosing the optimal x and z at each point in time. The solution is

$$(1-\alpha)\ \gamma\tilde{x}^{(1-\alpha)\gamma-1}\,\tilde{z}^{(1-\alpha)(1-\gamma)} = p_m\left(1+\tau_m\right)\theta_m \tag{3}$$

$$(1-\alpha)\left(1-\gamma\right)\ \tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)-1} = p_n\left(1+\tau_n\right)\theta_n \tag{4}$$

where tildes denote equilibrium values.

Suppose all tax revenue is rebated back to households, who are the owners of capital and rent it to firms. Therefore, in equilibrium household disposable income is

$$y = k\left(\tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)} - p_m\,\tilde{x} - p_n\tilde{z}\right) \tag{5}$$

and the households' dynamic budget constraint is

$$\dot{k} = k\left(\tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)} - p_m\,\tilde{x} - p_n\,\tilde{z}\right) - c, \tag{6}$$

where c is consumption.

Standard optimization techniques dictate that along an optimal consumption/savings path all variables should grow at the speed

$$\begin{aligned} g &\equiv \frac{\dot{y}}{y} = \frac{\dot{k}}{k} = \frac{\dot{c}}{c} = \sigma\left(\frac{\partial\dot{k}}{\partial k} - \rho\right) \\ &= \sigma\left(\tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)} - p_m\,\tilde{x} - p_n\,\tilde{z} - \rho\right) \end{aligned} \tag{7}$$

where σ is the intertemporal elasticity of substitution in consumption and ρ is the subjective time discount rate.

It follows that maximizing the term $\tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)} - p_m\,\tilde{x} - p_n\,\tilde{z}$ maximizes the rate of growth of the economy. And, as the first appendix shows, it also maximizes welfare.

3.1.1 The effects of economic reforms

We are ready to ask how it its that economic reforms affect growth and welfare. Define a reform first as a policy-induced increase in one of the input ratios. Suppose that x is the education-capital ratio and z is the infrastructure-capital ratio. Then, a reform consists, Washington-consensus like, of "increasing" the provision of education or infrastructure. If schools or roads are publicly built and run, then governments can affect the quantities provided by decree. Let us consider that case first.

Differentiating 7 yields

$$\begin{aligned} \left.\frac{\partial g}{\partial x}\right|_{x=\tilde{x},\ z=\tilde{z}} &= \sigma\left[(1-\alpha)\,\gamma\tilde{x}^{(1-\alpha)\gamma-1}\,\tilde{z}^{(1-\alpha)(1-\gamma)} - p_m\right] \\ &= \sigma\left[(1+\tau_m)\,\theta_m - 1\right]p_m \end{aligned} \tag{8}$$

and

$$\begin{aligned} \left.\frac{\partial g}{\partial z}\right|_{x=\tilde{x},\ z=\tilde{z}} &= \sigma\left[(1-\alpha)\,(1-\gamma)\ \ \tilde{x}^{(1-\alpha)\gamma}\,\tilde{z}^{(1-\alpha)(1-\gamma)-1} - p_n\right] \\ &= \sigma\left[(1+\tau_n)\,\theta_n - 1\right]p_n, \end{aligned} \tag{9}$$

where the second equality in each case comes from applying first-order conditions 3 and 4, respectively. Results are intuitive. The "total" distortion affecting each input is $(1+\tau_i)\,\theta_i - 1$, $i = m, n$. If the total distortion is zero then the effect of the reform on growth is zero, since the private sector would have chosen already the level of education or infrastructure that maximizes growth and welfare. But if the total distortion is non-zero there is room for affecting outcomes by a reform that changes the provision of m or n as a share of capital k at each point in time. Of course, increasing m (or n) raises growth and welfare only if $(1+\tau_m)\,\theta_m > 1$ (or $(1+\tau_n)\,\theta_n > 1$), so "too little" of the input is supplied in equilibrium. Conversely, if the total distortion is negative then too much of the input is supplied, so a growth and welfare-enhancing reform consists of cutting back in the supply of education or infrastructure.

Note that if $\tau_i = 0$ so that there is no tax or subsidy, then –since $\theta_i > 1$ by construction– too little of the input is used. This is because the social return on the input is larger than the private return, and the social return is not fully internalized by the representative firm. If $\tau_i > 0$, then a tax is present, and this tax distortion amplifies the distortion arising from the externality.

But if $\tau_i < 0$, then we have a subsidy which can partially or totally offset the effect of the externality. Full offset happens of course if $(1+\tau_i)\,\theta_i = 1$, in which case there is no growth effect of a reform.

The second observation that emerges from the exercise is that the growth and welfare effect obtained from increasing or decreasing the supply of a productive input is a function of the size of the pre-existing distortions, tax or otherwise. That is, if a benevolent government could undertake only one reform (for political reasons, for instance), it should alter supply conditions in that sector in which the distortions are bigger. And if no distortion is present, of course, then no reform should be undertaken.

3.1.2 Eliminating distortions

If schools and roads are privately provided (as is the case with most other productive inputs), then government can only affect quantities indirectly, through tax or subsidy schemes. This is more complicated because subsidizing schools, for instance, affects the relative price of schools in terms of roads, and will typically affect the quantities supplied of both inputs. In fact, as we shall see, eliminating distortions (as opposed to changing quantities by fiat) is a great deal trickier a policy exercise.

Consider, for instance, the effect of lowering each tax at a time leaving the other tax unchanged. Differentiating 7 using first order conditions 3 and 4 we have

$$\left.\frac{dg}{d\tau_m}\right|_{x=\tilde{x},\ z=\tilde{z}} = -\frac{\sigma\theta_m p_m \tilde{x}}{\alpha}\left[1 - \frac{1-(1-\alpha)(1-\gamma)}{(1+\tau_m)\,\theta_m} - \frac{(1-\alpha)(1-\gamma)}{(1+\tau_n)\,\theta_n}\right] \tag{10}$$

$$\left.\frac{\partial g}{\partial \tau_n}\right|_{x=\tilde{x},\ z=\tilde{z}} = -\frac{\sigma\theta_n p_n \tilde{z}}{\alpha}\left[1 - \frac{(1-\alpha)\,\gamma}{(1+\tau_m)\,\theta_m} - \frac{1-(1-\alpha)\,\gamma}{(1+\tau_n)\,\theta_n}\right] \tag{11}$$

So the signs of the effects depend on the signs of the terms inside square brackets. Suppose first that $(1+\tau_n)\,\theta_n = 1$, so that distortions affect only the m sector. Then we have

$$\left.\frac{dg}{d\tau_m}\right|_{x=\tilde{x},\ z=\tilde{z}} = -\sigma\theta_m p_m \tilde{x}\left[\frac{1-(1-\alpha)(1-\gamma)}{\alpha}\right]\left[1 - \frac{1}{(1+\tau_m)\,\theta_m}\right] \tag{12}$$

In this case the derivative is negative –so that reducing τ_m increases growth and welfare– if $(1+\tau_m)\,\theta_m > 1$, which is the same as before: cutting taxes is

desirable only when the total distortion affecting the sector is such that the input is undersupplied in equilibrium. The same is true for the derivative in 21.

Notice the effects that arise from second best interactions. With no externality ($\theta_m = 1$), all we require for cutting taxes to be desirable is $\tau_m > 0$, which is obvious: only positive taxes call out for reduction. But if there is a positive externality ($\theta_m > 1$), the condition becomes $-\tau_m < \frac{\theta_m - 1}{\theta_m}$, which again is intuitive: cutting taxes (which is equivalent to enlarging the subsidy when $\tau_m < 0$) is only desirable when that subsidy is too small. Alternatively, imagine we had a negative externality ($\theta_m < 1$) leading to overuse of the input. In that case the condition is most easily interpreted if written $\tau_m > \frac{1-\theta_m}{\theta_m}$: such an externality calls for a positive tax to offset it, and cutting that tax is desirable only if it is "too high" to begin with.

Notice also that the effects are non-linear: the size of the derivative in 12 depends on the initial size of the distortions –both directly and through $\tilde{x}$.

Things are more complicated when both sectors are distorted, as 20 and 21 reveal. Note that distortions both in the own sector and the other sector matter for the sign and size of growth effects. In fact, the overall distortion is a weighted average of distortions in both sectors. What is the effect of moving one distortion leaving the other unchanged? The derivative in 20 is always negative, so that cutting τ_m raises growth and welfare, if

$$1 > \frac{(1-\alpha)(1-\gamma)}{(1+\tau_n)\theta_n} + \frac{1-(1-\alpha)(1-\gamma)}{(1+\tau_m)\theta_m} \tag{13}$$

This inequality is satisfied if the distortions in both sectors are sufficiently large. For instance, if both $(1+\tau_n)\theta_n$ and $(1+\tau_m)\theta_m$ are larger than one, it holds. Alternatively, it holds if $(1+\tau_m)\theta_m$ is larger than one and $(1+\tau_n)\theta_n$ is not too far below one. Put differently, cutting taxes in the m sector could be bad for growth if the n sector is heavily subsidized, so that moving toward a subsidy in the m sector as well would increase overall distortions.[24]

Notice that here the effect also involves separability: the impact on growth of cutting distortions in the m sector depends not only on the size of initial

[24]Notice that in this model distortions act as complements: that is, if one sector is subsidized, for instance, subsidizing the other is bad for growth. But this specific feature is model-specific. It is not hard to think of models where distortions could interact differently. Depending on the elasticity of substitution between factors and other features, subsidizing one sector when the other is already subsidized could be good for growth. This would be true if what mattered, for instance, was the relative degree of tax or subsidy in each sector.

distortions in the m sector itself, but also on the size of initial distortions in the n sector. If this is true in this toy economy with CES preferences and Cobb-Douglas production, it is almost sure to be true in more complicated economies. And non-separability is key to reform in practice, I will argue, because almost by definition economies in need of reform have distortions of varying sizes in many sectors.

3.1.3 Choosing what to reform

Suppose both the m and the n sector are distorted, but only one distortion can be removed. Which of the two sectors should be chosen? If the initial τ's are the same and the θ's are also the same, then expressions 20 and 21 reveal that the effect of reducing τ_m is larger than the effect of reducing τ_n if $\gamma > 1 - \gamma$, which is intuitive: reducing τ_m increases the supply of m directly, and this in turn affects output with elasticity γ.

Other cases are more complex. In general the answer depends on α, γ, both τ's and both θ's.

3.1.4 Summary

The example in this section underscores some points worth keeping in mind about the relationship among distortions, reforms and growth:

1. Increasing the supply of a productive input only increases growth if that input was initially undersupplied (presumably because of distortions).

2. Even with a single distortion, the effects of reducing it are non linear: they depend on the initial size of the distortion.

3. If more than one distortion is present, then typically the effect on growth of removing one distortion depends of the size of all the others. The relationship between distortions and growth involves non-separability of the relationship between policy distortions and growth.

4. Because of this, removing one distortion while leaving the others unchanged may have small and even negative effects on growth.

5. If only one distortion can be removed while leaving others unchanged, which distortion should be chosen? The answer to this question depends in a complicated way on all the coefficients and distortions in the system.

4 Looking for distortions in Latin America

The preceding subsections suggests that the effects of economic reforms depend on the initial size and location of distortions. How large are these distortions in Latin America? How much does their size vary both across sectors and across countries?

To get a handle on this question we make the input structure more specific. The second appendix sketches out a model in which output is made with a production function that involves physical capital, unskilled human capital and skilled human capital, with a non-unitary elasticity of substitution between these two factors. In turn, demand for each of these inputs can be distorted by externalities or tax wedges, just as in the model above. The appendix shows that given profit maximization, factor returns are

$$\frac{w_s^m}{w_u^m} = \delta_h \left(\frac{h_s}{h_u}\right)^{\sigma-1} \tag{14}$$

$$r^m = \delta_k \frac{\alpha y}{p_k k} \tag{15}$$

where in the first expression w_s^m/w_u^m is the skill premium, h_s is the stock of skilled human capital, h_u the stock of unskilled human capital, $(1-\sigma)^{-1}$ the elasticity of substitution in production between the two kinds of human capital and $\delta_h > 0$ a summary of distortions affecting human capital. In the second expression, r^m is the return to physical capital, which depends on α, the share of physical capital, the output capital ratio y/k, the relative price of capital p_k and $\delta_k > 0$ a summary of distortions affecting physical capital. In all cases the superscript "m" indicates a "market" return.

In the absence of distortions these factor returns would be

$$\frac{w_s^n}{w_u^n} = \left(\frac{h_s}{h_u}\right)^{\sigma-1} \tag{16}$$

$$r^n = \frac{\alpha y}{p_k k} \tag{17}$$

where the superscript "n" denotes "no distortion." We can think of these as the social rates of return.

It follows from these two sets of equations that

$$\frac{w_s^m/w_u^m}{w_s^n/w_u^n} = \delta_h \tag{18}$$

and

$$\frac{r^m}{r^n} = \delta_k. \tag{19}$$

If the LHS ratio is far from one in a given market, then the market for that factor is very distorted. Note that if δ_h is smaller than one we have that skilled human capital is more heavily distorted or "taxed" than is unskilled human capital, and viceversa. Note also that δ_k is smaller than one we have that physical capital is negatively distorted or "taxed" in net terms. Recall that these coefficients are a summary (see the second appendix for details) of all distortions, including official taxes, *de facto* taxes (such as confiscation or theft) and externalities or spillovers. They also include distortions on the demand for and the supply of each input. So demand and supply distortions cannot be "identified" separately with this approach.

But if one can construct the ratios on the LHS one has a proxy for the size of total distortions in a given factor market. The market returns w_s^m/w_u^m and r^m can be measured directly, while the social returns w_s^n/w_u^n and r^n must be constructed using stocks of the different kinds of capital and assumed values for the relevant coefficients. That is what I do next.

4.1 A few calibrations

Identify "skilled" as possessing tertiary education and "unskilled" as lacking such training. The ratio h_s/h_u is then equivalent to the share of population with tertiary education over the share without, and comes from IADB (2004). The substitution parameter σ is set to 0.286, following Katz and Murphy (1992). These data, using 16, yield w_s^n/w_u^n.

Stocks of physical capital, relative prices of capital and levels of output we take from Klenow and Rodríguez-Clare (2004). That plus the standard assumption that $\alpha = 1/3$, all plugged into 17, yield r^n.

The market return premium w_s^m/w_u^m comes from Behrman, Birdsall and Szekely (2000), who in turn compile and combine 79 household surveys from 18 Latin American countries over the period 1980-1998.[25]

Finally, the "market" interest rate r^m is the most difficult to compute, given Latin American countries' notorious macroeconomic instability. Since

[25] I also tried computing the skill premium using the standard Mincerian formulation $\frac{w_s^m}{w_u^m} = e^{\beta s}$, where β is the return to higher education and s is the number of years a tertiary education lasts. Data for the country-specific β and s was taken from IADB (2004). Results were quite similar, so I do not report them here.

these are small open economies from a financial point of view, the relevant interest rate ought to be the world interest rate plus the country-specific risk premium. To approximate it I take the EMBI yield for each country averaged over all the years it has been available since 1994, eliminating those years that De Gregorio and Lee (2004) define as crisis years.[26] For Bolivia, the only country in the group that does not have a bond yield included in the EMBI, I use the 3-month yield on Bolivian Treasury Bills.

The resulting ratios appear in Figures 6 and 7. Consider first the behavior of the relative skill premium, depicted in Figure 6. Two things are striking. The first is that for all countries except Venezuela and Chile (and Argentina, almost), the ratio is below 1, suggesting that the skill premium is lower than it should be given the relative supplies of both factors. In turn, this means that the market for skilled human capital is more heavily taxed or distorted than that for unskilled human capital. Only for Chile is the ratio substantially above one, reflecting a large observed skill premium that cannot be fully explained by relative factor supplies.[27] It is this abnormally large premium, parenthetically, that goes a long way in explaining Chile's notoriously unequal distribution of income.

The second feature of Figure 6 that is worth remarking on is the wide dispersion of values across countries. They range from 0.49 for Ecuador to 1.17 for Chile, showing wide variation in the extent of relative distortion of both sectors. This also suggests very different potential for economic reform across sectors and countries.

Next consider the market for physical capital. Ratios depicted in Figure 7 again are overwhelmingly below 1 (all except for Argentina's), suggesting that physical capital is negatively distorted or taxed in net terms. Put differently, countries have too little capital given the interest rates they have. The most extreme example of this phenomenon is Chile (again an outlier), which enjoys very low interest rates by regional standards but does not have a correspondingly higher capital-ouput ratio to show for it. One interpretation for this is that physical capital investment is particularly heavily taxed

[26] We took out the following years. a) if the crisis ocurred in the first 9 months of year t, we took out year t; b) if the crisis ocurred in the last 3 months of year t, we took out year $t+1$; and c) in addition, we always took out the year following that taken out according to (a) and (b) above.

[27] And this skill premium has been rising over time. If one uses the most recent Mincer coefficient reported for Chile in IPES (2004) to construct the skill premium, the figure rises from 1.17 to 1.28.

or distorted in Chile.

Figure 7 also shows wide dispersion in the ratios across countries. Figures range from 0.13 for Chile to 0.71 for Ecuador and 1.23 for Argentina (far and away an outlier in the other direction). So again the relative extent of distortion in the sector seems to vary a great deal within Latin America. Notice these ratios depend quite crucially on the relative price of capital, taken as exogenous here. This relative price can also range quite widely, from 1.02 in Uruguay to 1.97 in El Salvador, the country where capital is dearest in the Hemisphere. Explaining these latter differences is an important task in itself, not undertaken here.

These ratios are subject to several caveats. One is that the cross-country variation in variables such as the interest rate may be exaggerated by short-term macro volatility. I have tried to correct for this by taking averages across all available data points and taking out crisis years, but too much extraneous variability may still remain. A second objection is that in the presence of costs of adjustment, relations such as 14 and 15 only hold in steady state, and countries may vary in how close or far away from their respective steady states they are.[28] A third, is that these ratios depend quite crucially on the relative price of capital, taken as exogenous here. This relative price can also range quite widely, from 1.02 in Uruguay to 1.97 in El Salvador, the country where capital is dearest in the hemisphere. Explaining these differences is an important task in itself, not undertaken here.[29]

So there may be other reasons, aside from distortions, why the ratios $\frac{w_s^m/w_u^m}{w_s^n/w_u^n}$ and $\frac{r_m}{r_n}$ are different from one. But as a first cut at the data, the large cross-country variation in figures 6 and 7 does suggest one should think twice before assigning the same reform priority across countries in Latin America.

In the model above, total factor productivity A is not a choice variable, and therefore one cannot infer the extent of distortions in the market for technology or "productivity." But Klenow and Rodríguez-Clare (2004) have done exactly that. They build a model in in which each country's A relative to the world level is determined by the country's efforts in technology adoption, which they identify with a broad concept of R&D. A country's R&D investment is the sum of that performed by firms, who undertake R&D

[28] Assuming that the economy is at a steady state is standard in this literarature. See for instance Kleenow and Rodriguez-Clare (2004). Growth regressions are also based on a linear approximation that is only valid near the steady state.

[29] Bacha and Bonelli (2004) emphasize the role of the relative price of investment goods in explaining Brazil's path of capital accumulation.

together with accumulation of physical capital to maximize the present value of their future stream of profits. Finally, there is an externality, in that a firm's A increases not only thanks to its own R&D but also thanks to R&D performed by other firms in the economy. The firm's decision about how much to invest is determined by a dynamic optimization problem, which yields two first order conditions: one for investment in physical capital, and one for R&D. As in the example above, these first-order conditions contain the relevant distortions (including the externality and tax wedges) and can be used to infer, via calibration, the size of distortions in different countries.

Figure 8 summarizes their findings for Latin America, expressed as the implied "tax" on R&D activity that is needed to reconcile the measured A with that implied by their calibration. Results once again show wide variation in the implied distortion, ranging from taxes of 154 per cent in Peru and 124 percent in Mexico to subsidies of 53 percent in El Salvador, 26 percent in Uruguay and 24 percent in Chile. If an implied tax is present, Klenow and Rodríguez-Clare conclude a country has an "R&D shortfall." If an implied subsidy is present, the country is said to have an "accumulation shortfall." As Figure 8 makes clear, both cases are well represented in Latin America, with substantial quantitative variation.

Again, there are reasons other than taxes why the measured A could be different from that implied by the calibration. One is that the conditions used for the calibration only hold in steady state. Another is that Klenow and Rodríguez-Clare (2004) allow for a production function with only capital and labor, while other factors such as natural resources may also be important. So countries may exhibit a high measured (but misleading) TFP as a result of their large endowment of natural resources.[30] But the wide variation shown in Figure 8 calls for caution in applying the same medicine –for instance, to promote R&D– to countries that may well be suffering from very different diseases.

4.2 Using the OECD as a benchmark

The exercises so far show whether a country has a larger skill premium, interest rate or TFP than it should have, given its factor endowment and assumed technological parameters. But they are silent on whether the stocks

[30] Rodríguez-Clare (2005) discusses this and other issues, emphasizing the case of Chile. For that country, taking account of the role of natural resources reduces the implied R&D subsidy from 24 to 9 percent.

of cumulable factors –and by implication the skill premium, interest rate or TFP level– are in some sense the "right" ones. One way to see this is to compare national figures to a plausible benchmark, for instance the OECD.

Suppose there is a comparison group or country (OECD for short) that makes output with the same technology as the home country, but with no externalities or distortions of any kind. Then factor rewards in the OECD would be given by the conditions

$$\frac{w_s^*}{w_u^*} = \left(\frac{h_s^*}{h_u^*}\right)^{\sigma-1} \tag{20}$$

$$r^* = \frac{\alpha y^*}{p_k^* k^*} \tag{21}$$

Note asterisks denote the OECD. Using these two equations plus 16 and 17 we have

$$\frac{w_s^n/w_u^n}{w_s^*/w_u^*} = \left(\frac{h_s/h_u}{h_s^*/h_u^*}\right)^{\sigma-1} \tag{22}$$

$$\frac{r^n}{r^*} = \frac{y}{y^*}\frac{p_k^* k^*}{p_k k} \tag{23}$$

When these ratios are large, so are the social returns to an activity, compared to what they are in the OECD.

Figure 9 shows expression 22 plotted for the same sample of Latin American countries. The ratio ranges from a low 1.03 for Venezuela and 1.05 for Argentina, which are at almost OECD levels, to a high of 2.79 for Brazil and 2.39 for El Salvador. The room for increasing the share of the population with tertiary education, and thereby reducing the skill premium, varies hugely across nations of the region.

Figure 10 shows a plot for expression 23. All countries but two have ratios above one, suggesting in most economies of Latin America there is room for capital deepening. But the actual figures are again quite heterogeneous, ranging from 0.82 for Mexico and 0.92 for Brazil to 1.52 for El Salvador, 1.56 for Chile and 1.75 to Uruguay. Notice that again these ratios depend on the relative price of capital, which is quite different in various Latin American countries than in the OECD.

Finally, Figure 11 shows the ratio A/A^*, where both quantities are calculated in the standard way –that is, as residuals computed using the production function and values for the factors of production. Productive Chile

appears with an A that is 0.79 of the OECD's; Uruguay is closely behind with 0.78, followed by El Salvador with 0.77 and Argentina with 0.74. At the other end of the spectrum, Peru and Bolivia's As are only 0.42 of the rich countries', and Ecuador's is 0.54. This measure shows substantial variation across nations of the region yet one more time.

5 Alternative reform strategies

With multiple distortions, there is ample room for second-best interactions. Given this, mis-designed partial reform can be ineffectual or even backfire in many ways. Keeping these points as background, consider now several archetypal reform strategies.

5.1 Wholesale reform

One way to eliminate all ambiguities and uncertainties with regard to the consequences of reform strategies is simultaneously to eliminate all distortions. If all the wedges are tackled and eliminated simultaneously, none of the second-best issues we have highlighted above remains relevant. Wholesale reform is guaranteed to improve welfare. The best possible economic growth rate is achieved by eliminating all obstacles that stand in its way.

But notice what this strategy requires. It requires us not only to have complete knowledge of all prevailing distortions, it also necessitates that we have the capacity to remove them all in their entirety. This is the technically correct, but practically impossible strategy.

5.2 Do as much as you can

The second strategy, which seems to us to characterize the prevailing approach today, is to ignore the basic economics of the framework outlined above and to simply go for whatever reforms seem to be feasible, practical, politically doable, or enforceable through conditionality. This is a laundry-list approach to reform that implicitly relies on the notions that (i) any reform is good; (ii) the more areas reformed, the better; and (iii) the deeper the reform in any area, the better.

Our framework shows why this approach, even if practical, is faulty in its economic logic. First, the principle of the second-best indicates that we

cannot be assured that any given reform taken on its own can be guaranteed to be growth or welfare-promoting, in the presence of multitudes of economic distortions. Second, growth or welfare need not be increasing in the number of areas that are reformed—except in the limiting case of wholesale reform, as discussed above. Third, even if the reforms that are undertaken turn out to have a positive effect, they can amount to an inefficient use of scarce political capital: in the presence of second-best interactions, perhaps other –even smaller– reforms undertaken elsewhere could have provided a bigger effect for the same reform buck.

5.3 Second-best reform

A more sophisticated version of the previous strategy is one that explicitly takes into account the second-best interactions discussed above. Thus, one could envisage a reform strategy that is less ambitious than the wholesale approach, but that recognizes the possibility that interactions across distorted markets have the potential to both augment and counter the direct welfare effects. Under this strategy, one would give priority to reforms that engender positive second-best effects, and downplay or avoid altogether those that cause adverse effects.

The difficulty with a second best reform strategy is that many, if not, most of these second-best interactions are very difficult to figure out and quantify *ex ante*. The strategy requires having a very good sense of the behavioral consequences of policy changes across different markets and activities. In practice, most of the second-best interactions remain obscure, and tend to be revealed after the fact rather than *ex ante*.

5.4 Target the biggest distortions

If second-best interactions cannot be fully figured out and it is impractical to remove all distortions at once, reformers may instead focus on eliminating or reducing the biggest distortions in the economy.

This approach sounds plausible but has two severe shortcomings. First, it does require us to have a complete list of distortions, even those that do not take the form of explicit taxes or government interventions. Distortions that arise from market failures or imperfect credibility, for example, are unlikely to show up on our radar screen unless we have reason to look for them.

Second, this method does not guarantee that the reforms with the biggest impacts on economic welfare and growth will be the ones undertaken first. It may well turn out that the highest "tax" is on some activity with very limited impact. As we saw above, the size of the growth impact of a reform depends not only on the size of the distortion being removed, but on the sign and size of other distortions. For example, there may be very high labor taxes that discourage human capital supply, yet their removal could have miniscule effects on output and welfare if the economy is constrained not by human capital supply but demand.

5.5 Focus on the most binding constraints

In previous sections I have argued that if there are many distortions present, some are probably more important than others in preventing growth. Hausmann, Rodrik and Velasco (2004) term that one key distortion (or set of distortions) the binding constraint to growth. It follows that to maximize growth one should go for the reforms that alleviate the most binding constraints, and hence produce the biggest growth bang for the reform buck. Rather than utilize a spray-gun approach, in the hope that we will somehow hit the target, focus on the bottlenecks directly.

Identifying the bottlenecks that impede growth is, of course, the challenge. We saw above that since the factors determining rates of growth are complements, a restriction in one of them will express itself in a high marginal return on that factor and a low return on the other factors. The technique for identifying distortions outlined in the previous section of this paper can help in the task of identifying constraints, for it can reveal sectors or activities in which returns are abnormally large or small, suggesting wedges of some kind are present.

But that knowledge is far from enough. One reason is that finding evidence that suggests that a wedge is present is not the same as ascertaining where the wedge actually comes from. In the examples in the model of the previous subsection, there was nothing to tell us whether the wedge originated in an externality, a tax, a distortion (government-generated or otherwise) in the price of productive inputs, or something else. More detailed econometric and case study work is indispensable to begin addressing that kind of question.

The Oxford English Dictionary (OED) defines "to diagnose" as "to distinguish and determine the nature of a disease from its symptoms." In Haus-

mann, Rodrik and Velasco (2005) we introduced the idea of *growth diagnostics*, which involves trying to identify the causes of low growth by reviewing many symptoms that may be associated with low growth, and use a succession of these to pin down causes of the problem.[31]

We know economic growth depends on the returns to accumulation (broadly construed), their private appropriability, and on the cost of financing accumulation. The first stage of the analysis aims to uncover which of these three factors pose the greatest impediment to higher growth. In some economies, the "constraint" may lie in low returns, in others it may be poor appropriability, and in yet others too high a cost of finance.

The next stage of the diagnostic analysis is to uncover the specific distortions that lie behind the most severe of these constraints. If the problem seems to be poor appropriability, is that due to high taxes, corruption, or macro instability? If the problem is with the high cost of finance, is that due to fiscal deficits or poor intermediation? This approach enables the design of remedies that are as closely targeted as possible.

Consider the decision tree in Figure 11, which organizes the policy questions so they can be asked in logical order. Is the problem one of inadequate returns to investment, inadequate private appropriability of the returns, or inadequate access to finance?

If it is a case of low returns to investment, is that due to insufficient supply of complementary factors of production (such as human capital or infrastructure)? Or is it due to poor access to appropriate technologies? If it is a case of poor appropriability, is it due to high taxation, poor property rights and contract enforcement, labor-capital conflicts, or learning externalities?

Or alternatively: if it is a case of poor finance, are the problems with domestic financial markets or external ones?

Moving down the branches of the decision tree is tantamount to discarding candidates for the most binding constraint on growth. In Hausmann, Rodrik and Velasco (2005) we applied this logic to the recent growth performance of Brazil, El Salvador and the Dominican Republic. Our preliminary conclusion was that the three countries face very different binding constraints on growth, which in turn require very different policies.

[31] See also Dixit (2005).

6 Conclusions

The message of the preceding sections can be summarized thus. There are some basic prerequisites –such as macroeconomic stability and institutions guaranteeing minimum respect for property rights– without which growth is sure not to happen. In the language of Easterly (2004) there are some "very bad policies" that are sure to impede growth and must be removed. Beyond these basic prerequisites, the effects of economic reforms on growth and welfare depend crucially on the size, sign and location of pre-existing distortions, and these seem to vary widely across Latin America. This calls for a careful growth diagnostics to identify the main obtacles to growth in each case.

6.1 Macro stability

The first "very bad policy" that must be avoided is macroeconomic instability. And in Latin America, as we saw above, currency and financial crises are the main source of macro risk.

Why the continued vulnerability to such crises, with their associated output costs? The fact that in the 1990s even the otherwise virtuous East Asian countries were swept by the crisis wave suggests that common external factors were at work. As a saying popular at the time put it: "if a lone driver crashes in a given road, then the fault is likely to be the driver's' but if most drivers crash on that same road, then the problem is must be with the road."

The main external factor involves the "sudden stops" in capital flows identified by Calvo (2001). In his words: "One key aspect of recent financial crises affecting emerging economies is that they have been accompanied by a major cutback in capital inflows. In Thailand, for example, these flows were cut by an amount equivalent to 26 per cent of its gross domestic product during 1997 In practice the amounts involved have been substantial and have consequently resulted in sharp falls in output and employment. This phenomenon, known as the Sudden Stop, is not experienced by developed countries, where the crises have been much less severe, and in many cases have been accompanied by an expansion of credit, rather than strong contraction as in the case of the emerging economies." And as Calvo and several others have observed, sudden stops tend to be bunched together -both across countries and across time-which suggests they, at least partially, are caused by a common external factor.

But this does not mean that internal factors are irrelevant. When it comes to crises and sudden stops, not all countries are created equal. A first question is: what are the country characteristics that determine the likelihood of being affected by a sudden stop? Several country characteristics seem to matter. Calvo, Izquierdo and Mejía (2003), Edwards (2004) and Cavallo and Frankel (2004) find that countries that are more open to trade are less likely to be affected by sudden stops.[32] Calvo, Izquierdo and Mejía (2003) and Edwards (2004) also find that weaknesses in the domestic financial system and extensive dollarization of liabilities (both public and private) increase the likelihood of a sudden stop. Previous overvaluation of the currency has long been identified as a source of vulnerability –see for instance Sachs et al (1996) and Frankel and Rose (1996).

A second question is: given that a country experienced a sudden stop, what are the country characteristics that determine the depth of the ouput contraction? Again, openness and liability dollarization seem to be key. With liability dollarization, depreciation of the domestic currency raises the cost of servicing debt and increases the possibility of failure by domestic firms and lending. But more open countries produce more tradeables, and are therefore more hedged against these fluctuations in relative prices. This is a central conclusion of Calvo, Izquierdo and Talvi (2002) and Sturzenegger et al (2004) among others. Moreover, the exchange rate regime matters: according to de Gregorio and Lee (2004) and Sturzenegger et al (2004), having a flexible exchange rate regime in the aftermath of the crisis reduces output costs. The numbers are not small. According to Sturzenegger et al (2003), after a crash countries with a floating rate grow on average between 4 and 6 percentage points more than those that do not. This increases to between 6 and 8 percentage points in the first two years.

In short: there exist policies that countries can adopt to reduce vulnerability to external shocks. Prudent fiscal and debt stances and stringent financial regulation are uncontroversial. Floating exchange rates and active policies to promote de-dollarization somewhat less so. In my judgement, all can contribute to make sure an episode of capital inflows will not end in a sudden stop followed by a crash.

[32] Of course, openess to trade is an endogenous variable, and one has to deal with this econometrically. Calvo, Izquierdo and Mejia (2003) do so by computing a two-step hierarchical bootstrapped confidence intervals for all variables in the model. Cavallo and Frankel (2004) use "gravity" factors as instrumental variables.

6.2 Institutional rudiments

"Very bad institutions" must also be avoided if a country is to grow. It is easy to agree on the basic task that institution should fulfill: guarantee at a "reasonable" cost that a "reasonable" share of the fruits of an investment accrue to the investor. Otherwise the incentives to invest –whether in physical capital, human capital, technology, or anything else– vanish, and so does economic growth.

It is also easy to identify the kinds of societies where this guarantee is absent: countries in semi-permanent conflict, where banditry is widespread and the monopoly on the use of force by the state has withered –failed states, in the currently fashionable phrase. But of the countries in the Americas, only Haiti and perhaps one or two other very small nations are in this situation or near it. The others have states that function to varying degrees, with uneven protection of property rights, both across countries and across time. Most are democracies, however imperfect, and the rudiments of the rule of law are present. And in some countries much more than the rudiments – nations like Chile, Uruguay and Costa Rica rank near or even above some developed countries in surveys evaluating the quality of legal institutions, of the bureaucratic and regulatory apparatus and the absence of corruption.

What is much harder is to identify and design institutional reforms to promote growth. There are at least three reasons for this. The first is that if institutional quality is very uneven in Latin America, it is likely that the (growth-related) returns from institutional reform will also be quite heterogeneous. Ending armed conflict had a big beneficial impact on economic stability and growth in El Salvador and –to a lesser extent– in Guatemala and Nicaragua.[33] At the other end of the spectrum, reform of the penal system in a country with good institutions –say, Chile– may be good for justice and human welfare, but may have a rather small impact on growth.

Moreover, once rudimentary protections of property rights are in place, exactly what other institutions or institutional improvements are growth-promoting remains a subject very much open to debate. Some authors argue that democratic reforms are key. Rodrik (2000), for instance, emphasizes the importance of local knowledge in successful institution-building, and argues that participatory democracy facilitates the use of such knowledge and thereby promotes growth. Others, like Glaeser, La Porta, Lopez-de-Silanes

[33] The Salvadoran growth spurt, however, was short-lived. See Hausmann, Rodrik and Velasco (2004).

and Shleifer (2004), that the good policies necessary to achieve economic success have often been applied by authoritarian regimes, with democratization coming later. Similarly, many experts emphasize the importance of formal legal arrangements to guarantee property rights. But then there is China, which has grown a great deal without much of a Western-style system of formal rights. Explanations why this is so vary. Qian (2003) and MacMillan (2003) provide alternative accounts. There are different views even on that current bugaboo, corruption. The view that corruption is bad for growth has many adherents, beginning in the recent academic literature with Mauro (1995). But others argue that what matters is not whether corruption exists but whether it is predictable (see Pritchett, 2003), and worry that the current obsession with corruption may lead to practices –like the "judicialization of politics"– that are detrimental to growth (see di Tella, 2004).

So the prescriptions for institutional reform are many, but the reliable ones are few and far between. In the words of Dixit (2005): "The trouble is that for every paper that endorses one kind of institution or policy, one finds another that makes precisely the opposite claim. Each is written by a prominent economist, and contains impressive arguments and evidence to support the recommendation being made."

Last but not least, what constitutes a growth-promoting institutions is almost sure to change with both time and per-capita income. Complex formal institutions have high set up and maintenance costs. That is why small and poor economies may well make do with largely informal arrangements backed by custom or social sanctions, while for larger and richer economies it makes sense to set up more complicated and formal institutional arrangements. Similarly, some kinds of economic activity, such as subsistence agriculture, may require certain kinds of institutions, while selling overseas or transmitting information over long distances or creating new technologies may require very different ones: complex contractual arrangements, new kinds of intellectual property, and the institutions to back them up. This all means that the institutional reforms necessary to promote growth in an economy reliant on financial services and exports like Uruguay are almost sure to be different from those needed in mostly agricultural and rather closed Paraguay.

I end this sub-section with a caveat: none of the arguments presented here imply that institutional reforms are not important or that they should not be attempted. There are many reasons besides economic growth why incorruptible judges and policemen or transparent legislative and budget procedures are worth having. But at the same time, one should not necessarily expect

institutional improvements, no matter how large, to have a sizeable and quick impact on economic growth.

6.3 Beyond the basics

Beyond the basics –macro stability, some enforcement of property rights, and arguably enough openness to the rest of the world so that goods and services can flow outwards and new ideas and products can flow inwards– the rest is pretty uncharted terrain. That terrain can be traversed, but not if we use the same map for North and South, East and West. Building proper charts, so that we can identify and remove the different constraints that keep countries in Latin America from growing, should be the first order of business.

7 Appendix

Let the intertemporal utility function of the representative agent be given by

$$U = \int_0^\infty \left(\frac{\sigma}{\sigma - 1}\right) c_t^{\frac{\sigma-1}{\sigma}} e^{-\rho t} dt, \tag{24}$$

and the growth rate of consumption and capital be given by $\tilde{x}^\alpha \, \tilde{z}^\gamma - p\,\tilde{x} - q\,\tilde{z}$

$$\frac{\dot{c}_t}{c_t} = \frac{\dot{k}_t}{k_t} = \sigma\,(r - \rho) \tag{25}$$

which is **??** in the text, and where I have defined $r \equiv \tilde{x}^\alpha \, \tilde{z}^\gamma - p\,\tilde{x} - q\,\tilde{z}$. Combining this with 6 in the text one has

$$c_t = [r\,(1 - \sigma) + \sigma\rho]\, k_t. \tag{26}$$

Solving 25 yields

$$c_t = c_0 e^{\sigma(r-\rho)} = [r\,(1 - \sigma) + \sigma\rho]\, k_0 e^{\sigma(r-\rho)}, \tag{27}$$

where the second inequality comes from using 26 evaluated at $t = 0$. Using 27 in 24 one obtains

$$U = \left(\frac{\sigma}{\sigma - 1}\right) [r\,(1 - \sigma) + \sigma\rho]^{-\frac{1}{\sigma}} \, k_0^{\frac{\sigma-1}{\sigma}} \tag{28}$$

It follows that

$$\frac{\partial U}{\partial r} = [r\,(1 - \sigma) + \sigma\rho]^{-\frac{\sigma+1}{\sigma}} \, k_0^{\frac{\sigma-1}{\sigma}} > 0, \tag{29}$$

as claimed in the text.

8 Appendix

8.1 Basics

Suppose that in a given developing country technology is given by

$$y = A\left(k^{\phi}\overline{k}^{1-\phi}\right)^{\alpha}\left[h_u^{\sigma} + \left(h_s^{\theta}\overline{h_s}^{1-\theta}\right)^{\sigma}\right]^{\frac{1-\alpha}{\sigma}} \tag{30}$$

where h_u is unskilled human capital, h_s is skilled human capital, k physical capital (all defined in per-capita terms), A is an index of technology and bars denote economy-wide averages. If ϕ, θ and η are strictly between 0 and 1 there is an externality.

The problem of the firm is to maximize profits, given by

$$\begin{aligned} &A\left(k^{\phi}\overline{k}^{1-\phi}\right)^{\alpha}\left[h_u^{\sigma} + \left(h_s^{\theta}\overline{h_s}^{1-\theta}\right)^{\sigma}\right]^{\frac{1-\alpha}{\sigma}}(1-\tau) \\ &-w_s\left(1+\gamma_s\right)h_s - w_u\left(1+\gamma_u\right)h_u - r\left(1+\kappa\right)p_k k \end{aligned} \tag{31}$$

where τ is a tax on sales, w_i is the return to human capital of type i, r is the rental rate on physical capital, γ_s and γ_u are the non-wage components of human capital cost, p_k is the relative price of capital and κ is the non-rental, component of physical capital cost.[34] Note in principle γ_s, γ_u and κ could be positive or negative. Given profit maximization, factor rewards are given by

$$(1-\alpha)(1-\tau)\,y\left(\frac{h_u^{\sigma}}{h_u^{\sigma}+h_s^{\sigma}}\right) = \left(1+\gamma_u\right)w_u h_u \tag{32}$$

$$\theta(1-\alpha)(1-\tau)\,y\left(\frac{h_s^{\sigma}}{h_u^{\sigma}+h_s^{\sigma}}\right) = \left(1+\gamma_s\right)w_s h_s \tag{33}$$

$$\alpha\phi y(1-\tau) = r\left(1+\kappa\right)p_k k. \tag{34}$$

8.2 Looking for distortions: within country comparisons

Rearrange 33, 32 and 34 to obtain

$$\frac{w_s^m}{w_u^m} = \theta\left(\frac{1+\gamma_u}{1+\gamma_s}\right)\left(\frac{h_s}{h_u}\right)^{\sigma-1} \equiv \delta_h\left(\frac{h_s}{h_u}\right)^{\sigma-1} \tag{35}$$

[34] Note the factor returns, as defined, are after depreciation.

$$r^m = \left\{ \frac{\phi\,(1-\tau)}{1+\kappa} \right\} \frac{\alpha y}{k} \equiv \delta_k \frac{\alpha y}{p_k k} \tag{36}$$

where the superscript "m" denotes the market factor returns –that is to say, those that would be paid in the market given the set of distortions in place. Note that δ_h is small when θ is small (so that the externality in the use of skilled human capital is large), and is also decreasing in γ_s and increasing in γ_u. Therefore, if δ_h is smaller than one we have that skilled human capital is more heavily distorted or "taxed" than is unskilled human capital, and viceversa.

Note also that δ_k is small when ϕ is small (so that the externality in the use of physical capital is large) and is decreasing in τ and κ. Therefore, if δ_k is smaller than one we have that physical capital is more is negatively distorted or "taxed" in net terms.

Next define the "no distortion" factor returns as

$$\frac{w_s^n}{w_u^n} = \left(\frac{h_s}{h_u} \right)^{\sigma-1} \tag{37}$$

$$r^n = \frac{\alpha y}{p_k k} \tag{38}$$

We can think of these as the social rates of return.

Then we can construct the ratios

$$\frac{r^m}{r^n} = \delta_k \tag{39}$$

and

$$\frac{w_s^m / w_u^m}{w_s^n / w_u^n} = \delta_h, \tag{40}$$

which are summaries of the distortions affecting the markets for physical and human capital. These are the expressions shown in the text.

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Figure 1
GDP per capita annual growth in Latin America

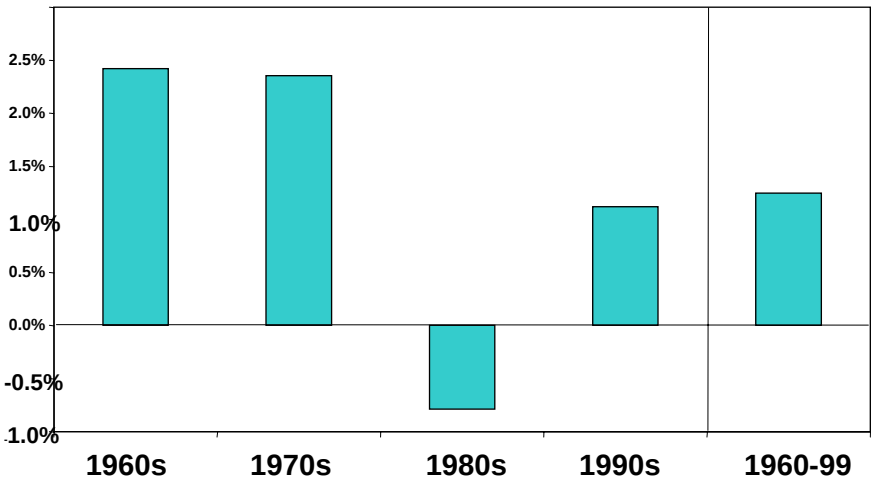
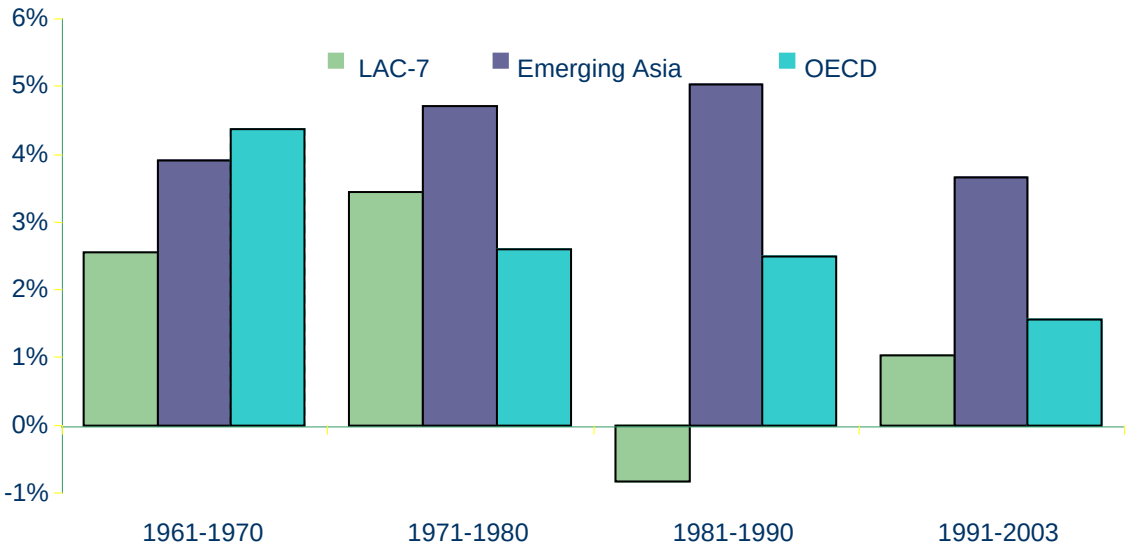


Figure 2
GDP per capita annual growth
in Latin America and the world



Notes: Regional GDP per capita. Asia includes Indonesia, Korea, Malaysia, Philippines and Thailand.

Source: WDI, World Bank.

Figure 3
Difference in GDP per capita annual growth between Latin America and comparators

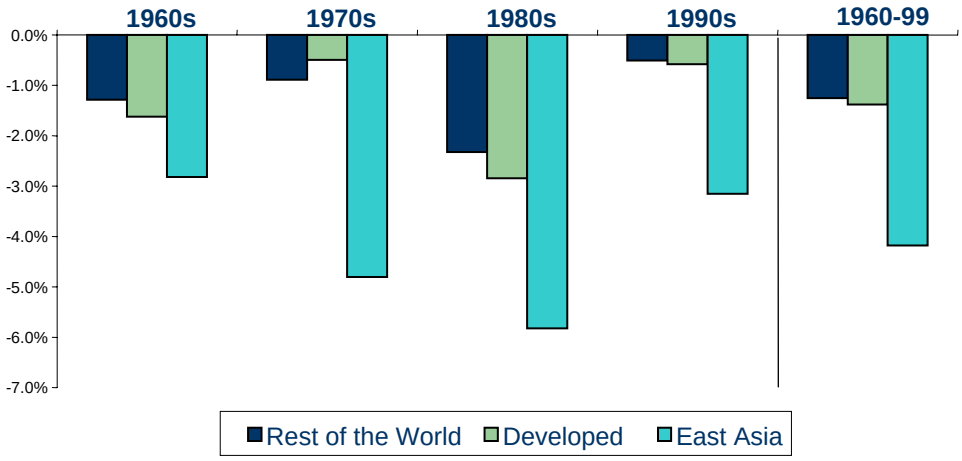
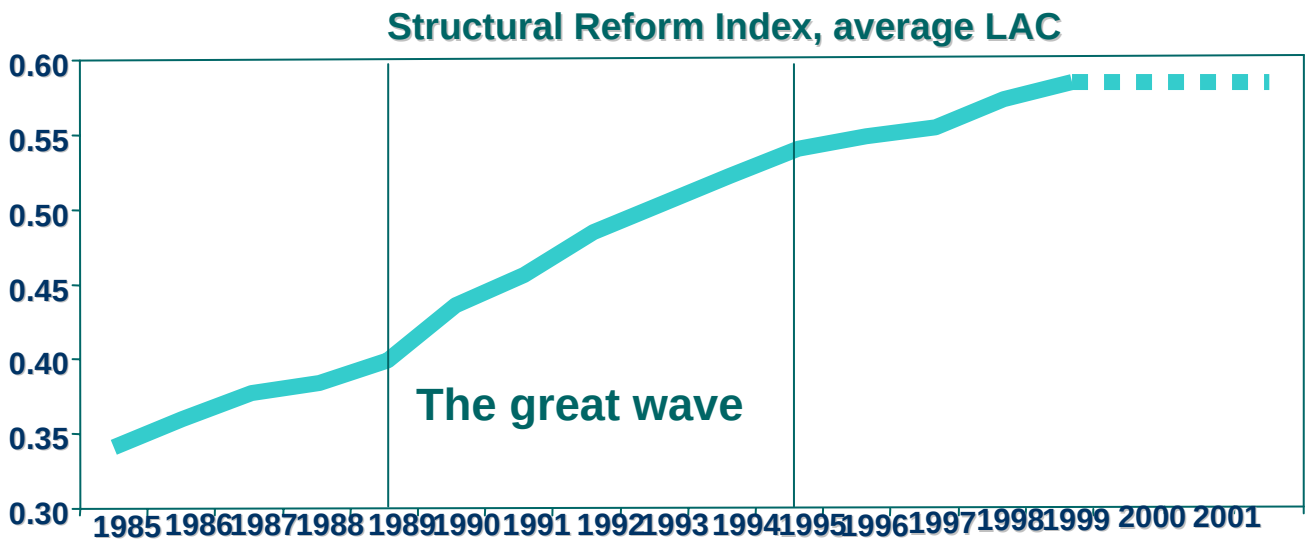


Figure 4



Source: Adapted from Lora (2001).

Figure 5: Indicators of quality of institutions
[source: ICRG Risk Ratings]

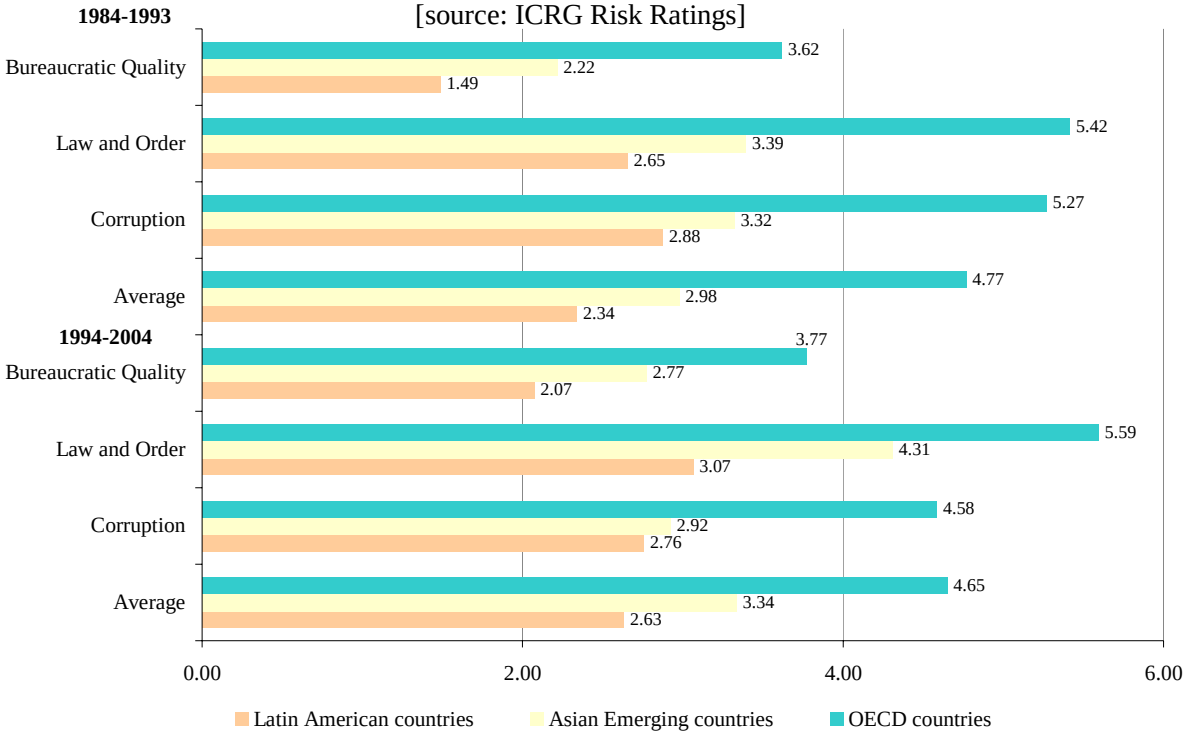


Figure 6: Measure of Distortions in Human Capital Markets:
$(w^m_s/w^m_u) / (w^n_s/w^n_u)$

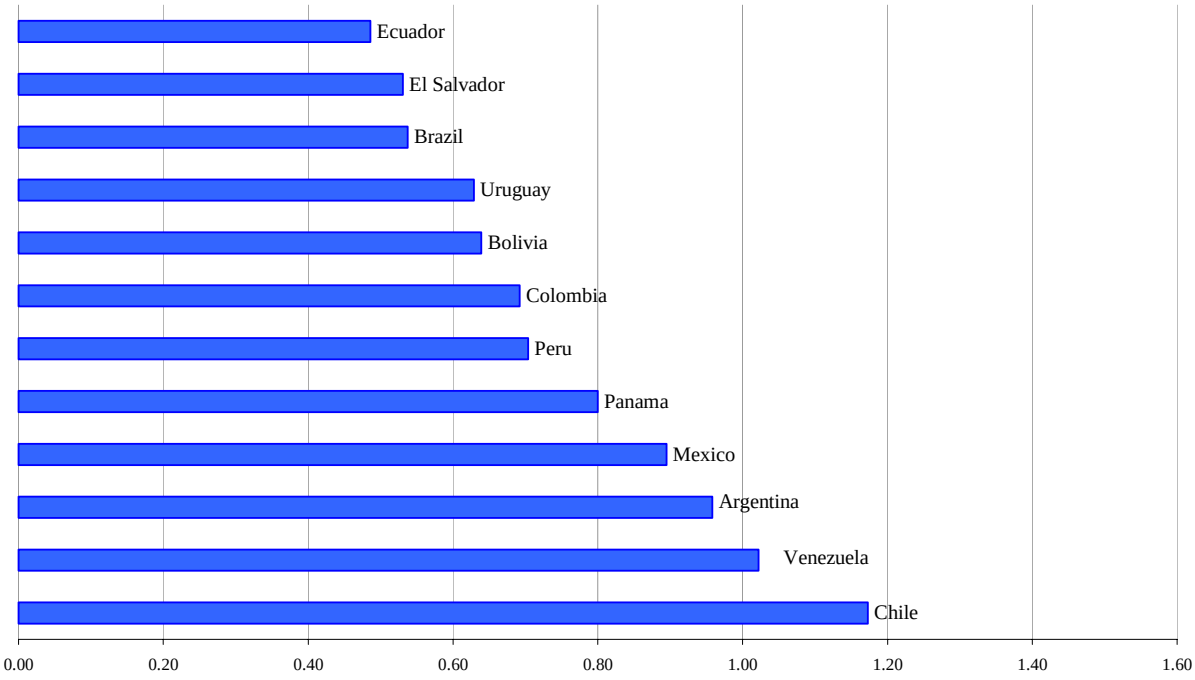
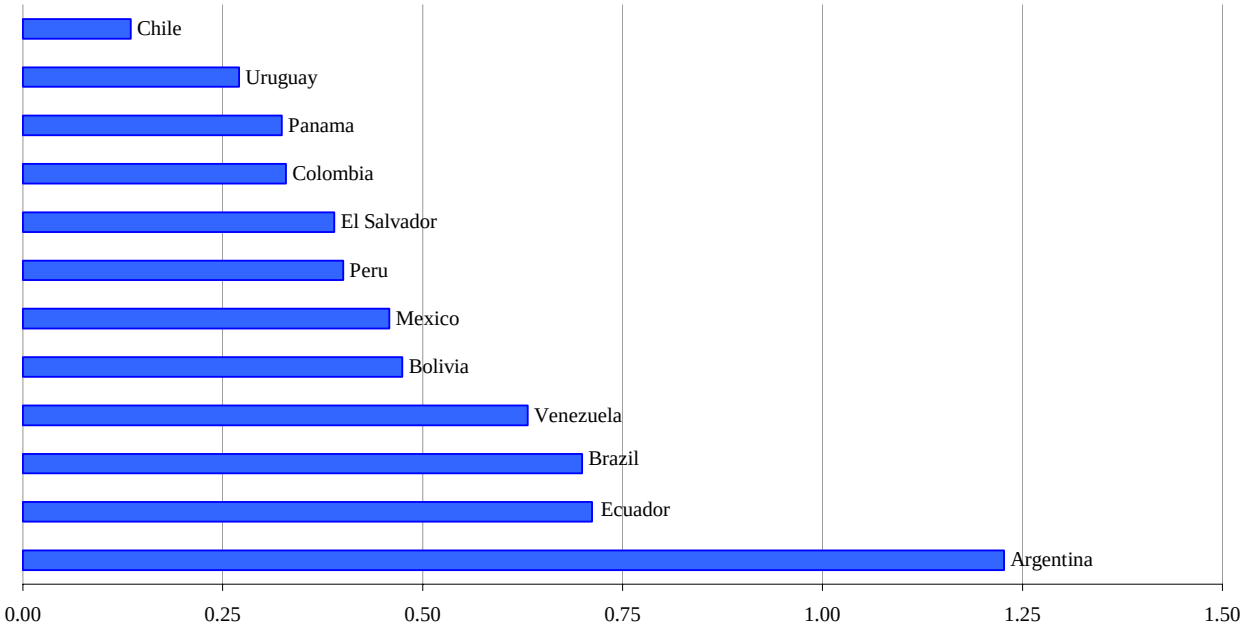


Figure 7: Measure of Distortions in Physical Capital Markets:
r^m/r^n



r^m: EMBI (stripped spread) + 10-year US T-Bill - US inflation rate.
Bolivia: 3-month T-bill Rate - US inflation rate
r^n: $\underline{\alpha y}$
(pk)

Figure 8: Implied R&D Tax Rates

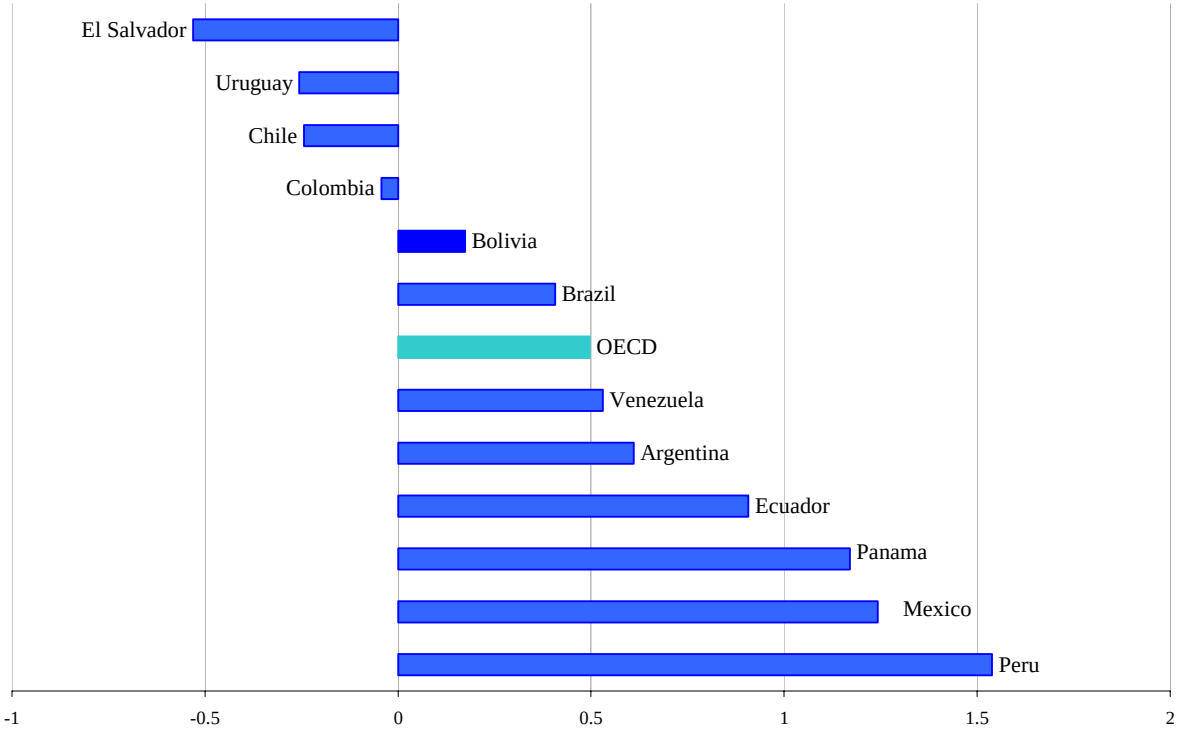


Figure 9: Cross Country Comparison

Human Capital Markets: $\left((h_s/h_u) / (h^*_s/h^*_u) \right)^{\sigma-1}$

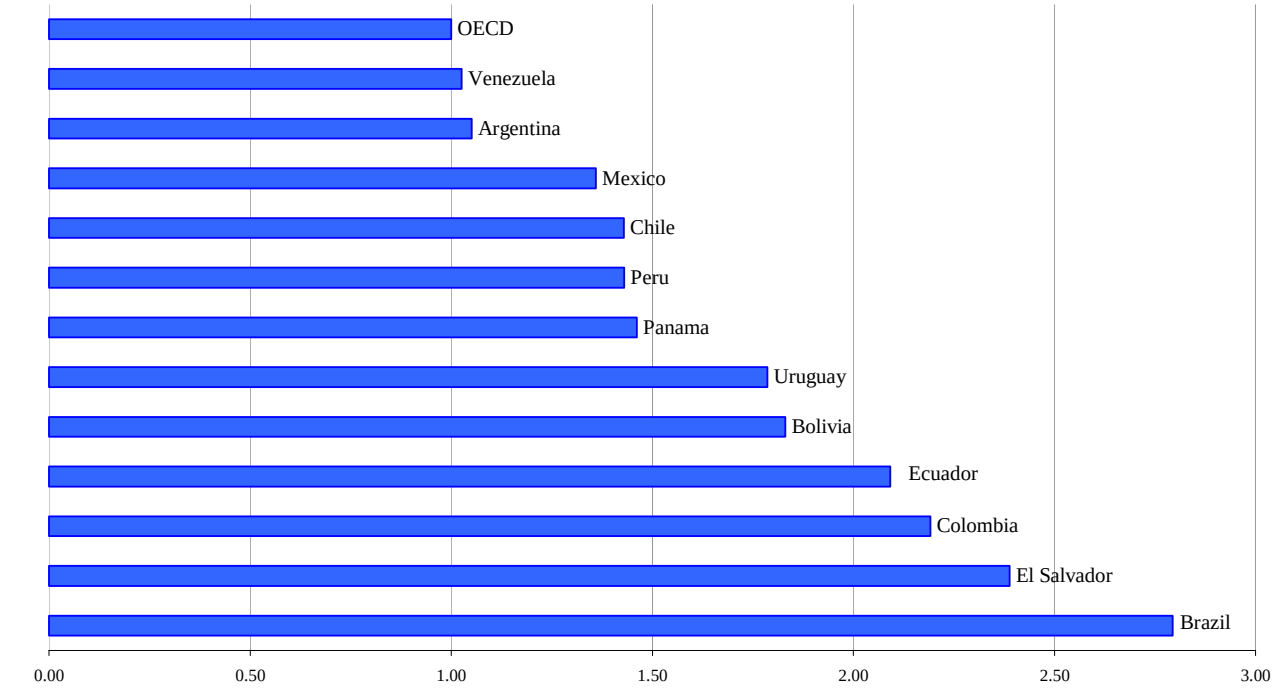


Figure 10: Cross Country Comparison: Physical Capital Markets
(y/y*)(k*/k)(p*/p)

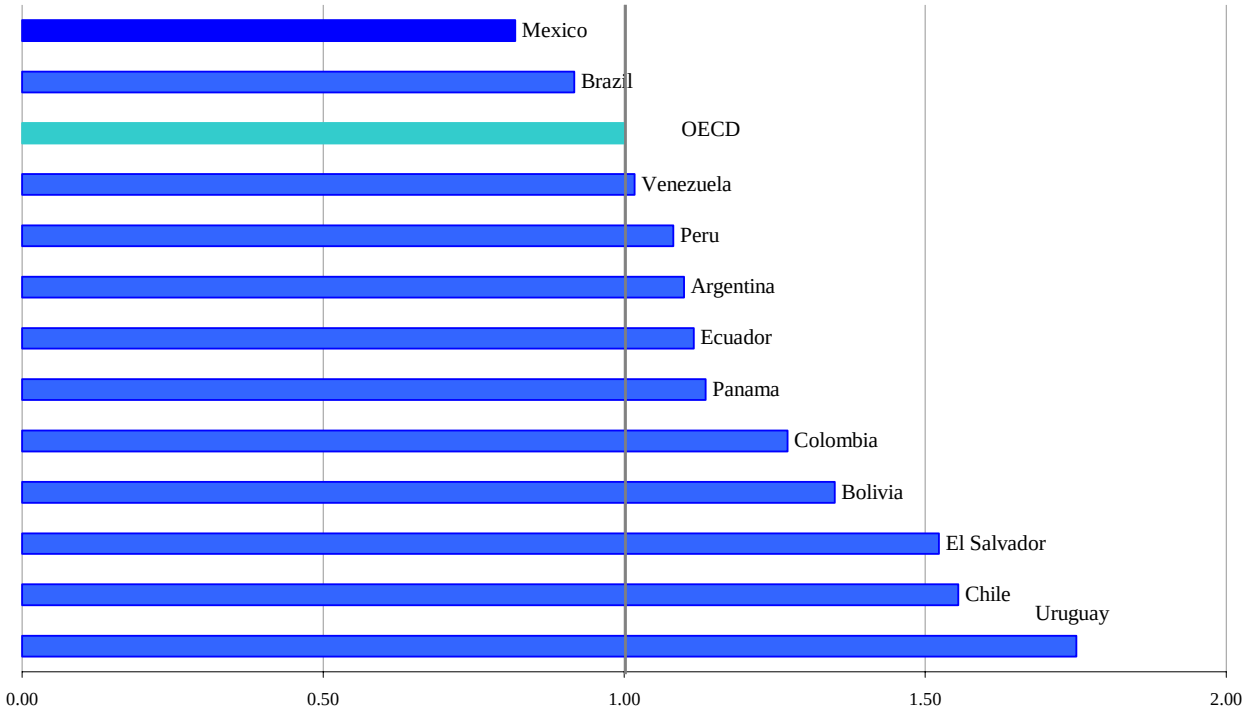


Table 1: Basic Indicator (averages over decades)

	Real GDP per capita in 2000				Life expectancy at birth total years				Years of education in population 15 and higher			
	1960s	1970s	1980s	1990s	1960s	1970s	1980s	1990s	1960s	1970s	1980s	1990s
Latin Am	1590	2000	2050	2170	56	61	65	68	3.1	3.8	4.7	5.4
Rest of World	2380	3350	4100	4810	58	61	65	67	3.3	4.3	5.3	6.3
Developed	13420	18860	23160	27790	71	73	75	77	7.1	7.8	8.7	9.4
East Asia	1860	3360	5590	9480	60	65	70	73	4.5	5.3	6.5	7.6

Table 2: Latin America Income Per Capita (%)
(with respect to comparators)

	60s	90s
Rest of the World	87%	59%
Developed	31%	20%
East Asia	128%	31%

Based on real GDP per capita (PPP)

Table 3: Balance of Payments Crises in East Asia and Latin America

China	1984M1	1989M12	1994M1		
Indonesia	1978M11	1983M4	1997M9		
Korea	1971M12	1980M1	1997M11		
Malaysia	1997M8				
Philippines	1970M2	1983M10	1997M9		
Thailand	1997M7				
Latin America					
Argentina	1975M3	1981M4	1987M2	1991M1	
Bolivia	1972M10	1980M1	1985M9		
Brazil	1979M12	1983M2	1987M1	1991M1	1999M1
Chile	1971M7	1975M1	1982M8		
Colombia	1998M9				
Costa Rica	1974M4	1981M1			
Dominican Republic	1985M1	1990M8			
Ecuador	1970M8	1982M5	1986M8	1992M9	1998M10
El Salvador	1986M1	1990M5			
Guatemala	1986M6	1990M8			
Haiti	1991M9				
Honduras	1990M4				
Jamaica	1978M5	1983M11	1991M9		
Mexico	1976M9	1982M2	1986M1	1994M12	
Nicaragua	1979M4	1985M2			
Panama	1973M2				
Paraguay	1984M3	1989M3			
Peru	1976M6	1982M12	1987M10	1992M6	
Trinidad and Tobago	1985M12	1993M4			
Uruguay	1972M3	1982M11	1987M12		
Venezuela	1984M2	1989M3	1994M5		