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Reform and Growth in Latin America: All Pain, No Gain?

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Abstract. The paper addresses the adequacy of post-reform growth in Latin America in the 1990s on the basis of international comparison and other relevant standards, analytically exploring and empirically testing a number of hypotheses to explain the perceived dissatisfaction with growth performance. It also estimates the long-run growth payoff of macroeconomic reforms, the additional gains that can be achieved by deepening this first generation of reforms, and the potential payoff from broadening the scope of reform into a second generation of reforms encompassing deeper structural and institutional areas.

Executive Summary

The last several years have witnessed a remarkable transformation of macroeconomic policy in many countries of Latin America. After the "lost decade" of the 1980s, a large number of countries in the region have sought to reactivate economic growth through strenuous efforts at macroeconomic stabilization and market-oriented structural reforms. The centerpiece of the stabilization effort has been a concerted fiscal adjustment, which has resulted in reduced budget deficits and a scaling down of current public sector spending relative to the size of the economies involved. Structural changes have involved privatization of state enterprises, financial reform, trade liberalization, and the removal of restrictions on capital movements, including the easing of regulations governing direct foreign investment. Such policies represent a sharp break with the past, and as such have required the exertion of substantial political will. Moreover, the focus on macroeconomic restructuring has taken priority in the short run over policies more narrowly targeted to alleviating pressing social needs. The justification for giving priority to macroeconomic restructuring has been the promise of much faster economic growth.

Economic growth has indeed accelerated for Latin America as a whole during recent years, yet the growth levels recorded by most individual countries still fall short of what many observers would regard as satisfactory, and are far from those attained for extended periods by several economies in East Asia. The questions posed by this experience, then, are why the reforms implemented to date have not yielded significantly higher growth dividends, and what are the implications of this for future policies in the region.

This paper considers four possible explanations for Latin America's recent growth performance:

(1) The thrust of the reforms may have been misguided. The implication would be that Latin America needs a new growth model for the future.

(2) The reforms may be working as well as could reasonably be expected, but the amount of reform undertaken may have been insufficient to deliver the growth performance for which some observers may have hoped. The implication would be that the reform effort needs to be intensified in the directions already being pursued if these goals are to be reached.

(3) The reforms already implemented may actually be sufficient to deliver significantly higher growth in the region, but such growth rates may not yet have materialized because of the negative influence of transitory factors, possibly an adverse international environment or lags in the materialization growth effects of reforms. If so, the passage of time will deliver higher growth rates. On the other hand, if transitory factors have actually been *positive* (say because the undertaking of reform itself triggered a transitory boom), then the region's growth performance may be even more disappointing in the long run than currently appears to be the case.

(4) Finally, it is possible that, while macroeconomic reforms have improved growth performance, they are only part of the growth story. This would mean that even with additional progress in this area Latin America would be unlikely to attain the growth rates it seeks. The implication is that the scope of reform may have to be extended beyond the macroeconomic sphere.

We have explored the empirical role of each of these hypotheses. To address hypothesis (1), we reviewed the evidence in the professional literature concerning the links between reform measures of the types recently implemented in Latin American and long-term economic growth. There is a strong professional consensus, based on a substantial amount of cross-country experience both internationally and within Latin America itself, that macroeconomic stabilization and market-oriented structural reform are conducive to the acceleration of long-run growth. Our own empirical research, consisting of the estimation of a panel regression linking reform variables and other growth determinants to long-run economic growth for 69 countries (including 18 Latin American countries), using five-year average observations over the period 1960-95, supports this conclusion, in the sense that both the qualitative and quantitative effects of the reform variables on growth are consistent with those found by other researchers. Moreover, we have confirmed statistically that, as far as the growth response to reforms is concerned, Latin America is no different from other regions— i.e., reforms have effects on economic growth in Latin America that are not statistically distinguishable from the effects they have had elsewhere.

We have used our estimated empirical relationship between growth and its determinants to study the empirical roles of hypotheses (2)-(4) in explaining Latin America's growth performance in recent years (1991-95). Our findings were as follows:

(a) We found that the growth response to reforms has not been disappointing, in the sense that Latin America's recent growth performance can be satisfactorily explained using estimated effects of reforms (and other control variables) drawn from international experience— i.e., there has been no "growth puzzle" in Latin America during the post-reform period.

(b) Regarding the role of transitory factors, we found some evidence that reforms may indeed have triggered a short-rum boom in economic growth when initially implemented. However, this effect was quantitatively very small. The permanent, long-run growth boost caused by the macroeconomic reforms of the 1990s amounts to about 1.8 additional points of annual GDP growth in the region as a whole, enough to double the expected real income in 40 years. The good news in this respect is that recent growth experience does not seem to *overstate* the long-run positive effect of the reforms. Moreover, we also found that the worldwide growth cycle affected growth adversely in Latin America during the recent five-year period, implying that the positive effects of the reform on growth were partly masked by independent factors contributing to a growth slowdown. While the recent reforms contributed to an annual growth acceleration of about 2 percent on average in Latin America during the last five years, the adverse effects of the worldwide cycle tended to slow growth in the region by about 1 percent per year. Since these influences are likely to be partly transitory, this represents a second bit of good news.

(c) On the other hand, these transitory factors do not account for the difference between Latin American and East Asian growth performance. There remains a significant growth gap between the two regions, which in our panel amounted to about 4 ½ percent during 1991-95. A substantial amount of this gap (about 2 ½ percent) could be closed by pushing further in the direction of the reforms that have already been implemented. But while Latin America has made much progress in the area of macroeconomic reforms, its performance with regard to macro indicators still leaves it short of East Asian standards. The policy implication is that if East Asian growth rates are the standard of comparison, there is still work left to do in this area.

(d) Finally, however, macroeconomic reform does not appear to be all that is needed. Even though achieving East Asian standards on variables measuring macroeconomic reform would close the growth gap, this gap would not be eliminated. Closing the educational gap would make an additional contribution. Yet, of the total 4 ½ percent gap, we attribute about 2 percent to long-run structural differences in these economies and other factors unexplained either by our macroeconomic reform variables or by education and other control variables. This unidentified gap is even larger in comparison to OECD countries. Preliminary evidence shows that this gap is associated with higher volatility of the economic environment and higher income inequality in the Latin American countries, and we suspect that it is also associated with other deep-seated institutional and structural differences in these economies, as well. In any event, the gap suggests the need for a broadening of the scope of reform in Latin America beyond the macroeconomic sphere if the region's economies are to achieve the standard of performance that they seek.

I. Introduction

Latin American countries have undertaken extensive macroeconomic reforms during recent years.[1] The purpose of these reforms has been to improve the growth performance of countries in the region through an increased commitment to macroeconomic stability, as well as the implementation of structural policies designed to enhance the role of the market in allocating economic resources. These market-oriented macroeconomic reforms have represented a significant break with past policies in the region and have not been uncontroversial. They have thus required a significant amount of political will to implement. Economic growth during the reform period has indeed increased, on average, for countries in the region, but many observers consider the growth rates achieved to date to be inadequate with respect to several possible standards of comparison— e.g., the region's own past growth rate, the contemporaneous rates of growth

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[1] See Edwards (1995), Inter-American Development Bank (1996).

achieved by the East Asian "tiger" or "miracle" economies, or the rates of growth that would be required to significantly improve the standard of living of the poorest sectors of the population in Latin America.

Whether disappointment with the post-reform growth performance is justified or reflects expectations that were too high, the issue is, of course, what this state of dissatisfaction implies for future economic policy in the region. This obviously depends on the reasons why growth performance in the post-reform period has been unsatisfactory. Several logical possibilities exist:

(1) The most distressing option is that market-oriented macroeconomic reform has simply been the wrong policy prescription. In the past, Latin America has occasionally been swept by a variety of economic fads (populism, global monetarism, orthodox and heterodox varieties of inflation stabilization) that have not necessarily been conducive to the achievement of sustained growth in the region. Current policy changes may simply represent the latest failed economic experiment. If so, then the policy prescription is obviously to abandon it, though one would then have to specify what alternative should be favored instead.

(2) On the other hand, it is possible that the countries in the region have already implemented the changes required to achieve the desired growth performance, and all that remains is to sit tight and wait. This would be the case if, conditional on the reforms that have already been undertaken, the mere passage of time would be likely to deliver a more satisfactory growth performance in short order. If so, it may be necessary in the meantime to take steps to ameliorate the living conditions of the poorest, but the key requirement would be to consolidate the reform process and avoid backsliding. Under what conditions would the passage of time do the trick? There are at least two. Macroeconomic reforms may operate with a lag, so the payoff from recent reforms is still in the future. Alternatively (or additionally), reforms may have been undertaken in a temporarily unfavorable external environment, so that much higher growth rates will indeed materialize when the external environment improves. In either case, under this interpretation of events what has been done will soon work as promised, and it is important to stay the course.

(3) A third possibility is that countries that have begun the process of macroeconomic reform need to do much more of what they have been doing if they want to achieve satisfactory growth rates. While the reforms adopted may indeed have been the right ones (in the sense that the types of changes implemented to date are capable of moving economic growth in the desired direction), it is possible that the *magnitude* of reform has been insufficient. This insufficiency could take several forms. Most simply, observers may be exaggerating the amount of reform that has actually been achieved because of the sharp break that the new policies represent with the past and the amount of effort that has been required to produce these changes. Thus, while the reforms may have made Latin America look very different than it did several years ago, they still may not have advanced to the point where Latin America looks like East Asia. Alternatively, the relationship between specific macroeconomic reforms and growth may be nonlinear. In this case, while much may indeed have happened in Latin America, perhaps critical thresholds have not yet been reached beyond which the reforms would begin to make an important difference. For example, while the elimination of triple-digit inflation is a laudable achievement, it may be that the real growth payoff from reducing inflation comes only when the inflation rate is brought into single digits.[2]

(4) Finally, lagging growth may be attributable to a restricted *scope* of reform. Again, this may happen in two ways. First, there may be characteristics of Latin American economies that exert an *independent* influence on economic growth and have not yet been significantly affected by the reform effort. To be concrete, suppose that the set of all possible reforms is subdivided into macroeconomic reforms and all others, and call the latter "institutional" or "microeconomic structural" reforms. These may include changes in the legal framework, the administrative efficiency of the public sector bureaucracy, and in the distribution of important assets such as human capital and/or land. Then, suppose that the potential growth benefits of macroeconomic reforms have already been maximized, but that reforms of this type account for very little of the gap between actual growth in the region and the desired rate of growth. It may be, under this scenario, that even if

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[2] Actually, in this case there is indeed evidence of nonlinearity in the relationship, but it goes the other way -- i.e., the growth payoff comes from eliminating very high inflation, not from securing very low inflation. See Easterly and Bruno (1995).

institutional or structural characteristics exert no direct effect on growth, they may *interact* with macroeconomic reforms in such a way as to influence the growth payoff obtainable from the latter. In this case, unbalanced reform may create bottlenecks. Growth payoffs from very extensive reforms in some areas will not materialize until reforms in other areas have been implemented or deepened. For example, the growth payoff from macroeconomic stability and trade liberalization may not fully emerge until a flexible domestic labor market is in place to channel labor to its most productive uses. If there are, indeed, interactions between the effects of different reforms, then, while institutional or more structural reforms may already be under way, they may not yet have advanced to the point where the full benefits of the more extensive macroeconomic changes can begin to emerge. In either case— i.e., whether structural characteristics influence growth independently or through interactions with macroeconomic phenomena— doing more of the same in the existing areas of macroeconomic reform may have a low payoff in terms of desired growth rates until the reform effort is broadened.

These are obviously quite different interpretations of recent events, with very different policy prescriptions. How can we distinguish empirically among these possibilities? This boils down to answering one question: In the long run, and given an average growth external environment, are the macroeconomic reforms that have been implemented *quantitatively* sufficient to produce the growth outcome that is desired? If the answer is yes, then the policy prescription is (2). If it is no, then to discriminate among (1), (3), and (4) we need to determine whether the fault for insufficient growth lies with misguided reform, with an insufficient application of appropriate reforms already undertaken, or with the neglect of reform in other areas that are important for growth.

The previous possibilities can be represented by the following expression that explains per capita growth, g, in terms of a set of macroeconomic reform variables under consideration, r, and a set of control variables, c, known to be relevant for growth, such as changes in terms of trade. Delayed effects of reform are captured by also considering past reform. The remaining unexplained portion of the equation reflects other unknown factors underlying the observed growth performance, which can be structural (s) or temporary (t).

$$g = a.r(current) + a'.r(past) + b.c + s + t$$

The overall long-run growth contribution of reform, if it is sustained at the level r, is (a+a').r. The contribution of the other identified control variables is b.c, while other unidentified factors, possibly subject to policy interventions, explain the remaining portion, of which s is structural and t is transitory.

The four hypotheses about why actual growth performance has not reached satisfactory levels despite reform can be described in terms of the above equation. Hypothesis (1) states that the overall impact of reform, a+a', is negligible. The other hypotesis give alternative explanations of why growth performance has failed to achieve satisfactory levels. Hypothesis (2) states that substantial growth effects will be seen in due course, either because most of the reform effects are delayed (a is small but a' is large) or because an adverse transitory effect, t, is hiding the true underlying growth performance. Hypothesis (3), on the contrary, states that the growth contribution of reform is unsatisfactory because the reform itself, measured by r, has been small (rather than its marginal impact, a, being small). Finally, hypothesis (4) explains the growth shortfall in terms of the insufficient scope of reform. Under this interpretation, the contribution of the set of reform variables, r, is bound to be small relative to the contribution of other policies underlying c and s. A variant of this hypothesis is that the marginal long-run coefficient, a+a', depends on other variables outside of the scope of the current reform effort. This coefficient may be small in Latin America but would recover its normal level if the scope of reform is expanded.

The purpose of this paper is to attempt to sort out these potential explanations for Latin America's recent growth experience. It is divided into four sections. In the first section, we review the evidence concerning a market-oriented policy prescriptions of the types recently implemented in Latin America, based on the results of the empirical growth literature. Our finding is that there is indeed an overwhelming body of international evidence in support of the proposition that the market-oriented reforms have a strongly pro-growth effect— i.e., inflation stabilization, limited public consumption, commercial openness, financial deepening, and exchange rate unification are all associated with larger growth rates in the cross-country evidence. Thus, hypothesis (1) is difficult to sustain; the basic market prescription has strong empirical

support. We turn next to the issue of whether recent macroeconomic policy reforms in Latin America have worked as advertised— i.e., whether their *marginal* effects on growth have been consistent with international experience. Section III describes and evaluates recent work by Easterly, Loayza, and Montiel (ELM, 1996) that specifically addresses this issue. Section IV presents new empirical work designed to broaden the scope of the ELM analysis in several directions so as to focus more specifically on ways to discriminate among hypotheses (2)-(4). Based on the results of this section, Section V presents a decomposition of Latin America's recent growth experience that accounts for the differences between actual rates of growth experienced in the region during recent years and two of the standards of comparison cited above: previous growth in the region and contemporaneous growth in other regions. The final section summarizes the results, offers some tentative interpretations, and points to potentially fruitful areas of future research.

II. Market-Oriented Policies and Economic Growth

To address the question of whether the market orientation of recent Latin American macroeconomic reforms has been misguided in principle, in this section we briefly review the evidence from the professional literature on this issue. The standard procedure for estimating the effect of policies on growth has been to estimate cross-country regressions in which the average growth rate over the sample period for each country is the dependent variable, and in which the independent variables consist of two types of growth determinants: initial conditions (typically the level of per capita real GDP and the level of educational attainment of the population, as well as other possible variables such as measures of income inequality), and contemporaneous determinants of per capita income growth. The latter include both nonpolicy variables such as changes in the terms of trade, and a broad range of policy variables of interest. The coefficients of the policy variables are interpreted as the partial effects of the policy in question on the long-run growth rate, holding constant other growth determinants. The evidence reviewed in this section linking market-friendly policies to long-run growth is based on research of this type.

At least two issues arise in interpreting this evidence. The first is that the phrase "long run" has two distinct meanings in this context, namely permanent or long-lived, depending on the underlying model that is used to describe the growth process.[3] The empirical procedure adopted in the cross-country literature is agnostic with regard to whether long-run growth effects are permanent or refer to transitional dynamics. If the transition is sufficiently lengthy, this analytically important distinction may be of less significance empirically. The second issue concerns the interpretation of partial correlation as evidence of causation. In principle, correlation can reflect causation from policies to growth, from growth to policies, or from third factors to both. The inclusion of additional growth determinants in cross-country regressions is intended to eliminate the latter.[4] To eliminate the influence of reverse causation from growth to policies, where such causation is theoretically plausible, requires the use of instruments that can capture the exogenous component of variations in policies. Accordingly, in the overview of the evidence, which includes a multitude of studies on each issue, attention is focused on recent studies that address the issue of reverse causation.

A. Inflation Stabilization and Economic Growth

High rates of inflation can be expected to reduce economic growth through a variety of mechanisms which can influence both the rate of capital accumulation and the rate of growth of total factor productivity. For example, Fischer (1993) has argued that, since very high inflation serves no useful economic purpose but may do some economic harm, a government which tolerates high inflation is one which has lost macroeconomic control, and this circumstances is likely to deter domestic investment in physical capital. Others have argued that high inflation means unstable inflation and volatile relative prices, reducing the information content of price signals and thus distorting the efficiency of resource allocation, which may have a deleterious effect on the growth of total factor productivity over an extended period.

The cross-country evidence on the relationship between inflation and growth has recently been reexamined by Barro (1996), using a data set consisting of 100 countries, with annual observations on macroeconomic data from 1960 to 1990. He constructs a panel data set consisting of the three periods

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[3] In the context of a model of endogenous growth, the long-run growth effects of reform refer to effects on the permanent growth rate. In a neoclassical context, however, reform variables would alter the level of steady-state per capita income, rather than the steady-state growth rate. However, the rate of growth would be affected during the transition to the steady state.

[4] Though, of course, the omission of relevant variables can never be ruled out.

1965-75, 1976-85, and 1986-90. While his primary interest is in the relationship between inflation and long-term growth, his panel regressions control for a large number of additional explanatory variables, including, as suggested above, initial conditions, contemporaneous exogenous factors, and a diverse set of macroeconomic policy and outcome variables.[5] His central finding is that, other things equal, a 10 percent increase in the rate of inflation reduces long-run growth by about 0.025 percent per year. Barro finds that it is the level of inflation, rather than its variability, that affects growth adversely. [6]

Barro's work provides fairly strong evidence that sustained low inflation is indeed conducive to higher economic growth. However, this need not necessarily imply that the *transition* from high to low inflation should be expected to be associated with a contemporaneous *acceleration* in economic growth. It is conceivable that favorable growth effects from disinflation materialize only with a lag, so that growth may actually slow during the transition, and perhaps for some time thereafter, before achieving the higher levels suggested by the cross-country evidence described above. This issue is relevant to Latin American countries, because inflation stabilization in the region as a part of general macroeconomic reform remains a relatively recent phenomenon. What, then, does the evidence say about the growth effects of the transition from high to low inflation?

This question has recently been investigated by Bruno and Easterly (1995). They ask specifically what happens to economic growth as inflation moves from two or more years of rates in excess of 40 percent annually to rates of less than 40 percent sustained for at least two years. Their central findings are that, consistent with the cross-country evidence, growth falls by an average of 2.8 percent during the high-inflation episode, but **rises** by an average of 3.8 percent during a successful stabilization. Their general conclusion is that the sacrifice ratio may actually be **positive**— i.e., growth *accelerates* during and just after stabilization— when the initial level of inflation is high (greater than 40 percent). The inflation stabilization component of market-oriented macroeconomic reform policies can therefore be expected to be growth-enhancing.

B. Government Size and Economic Growth

Inflation stabilization implies the need to reduce fiscal deficits, which can be accomplished either by decreasing expenditures or by increasing revenues. The difference between the two approaches, of course, is the resulting size of the government sector. Does it make a difference for the subsequent performance of long-run economic growth which of the two approaches is undertaken— i.e., does the size of government have any direct relationship to the long-run rate of economic growth?

There are analytical reasons to believe that it might. In particular, holding the fiscal deficit constant, larger government expenditures imply the need for additional revenues. Since such revenues would be raised through distortionary taxation, this would be expected to reduce the rate of growth through adverse effects on the efficiency of resource allocation. On the other hand, some government expenditure may be directly productive. Government expenditures on health and education, for example, may best be interpreted as investments in human capital. Other government expenditures may represent investment in social capital, in the form of institutions that safeguard property rights. This reasoning suggests that both the level and composition of government expenditures may matter for long-term growth. Moreover, to the extent that productive expenditures are financed through distortionary taxes, the effect of larger government on long-term growth is theoretically ambiguous.

Barro (1991) constructs a cross-section sample of 72 countries by averaging annual data over the 1960-85 period and, in familiar fashion, examines the coefficients of a variety of government spending variables (as ratios to GDP) when other long-term growth determinants are controlled for in the regression. Government expenditures are desegregated into government investment, government consumption excluding spending on defense and education, spending on defense, education, and spending on transfer payments. *Ex ante*, Barro interprets government consumption net of defense and education as entering utility functions directly, not as productive input, so both this variable and the transfers variable would be

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[5] Barro's results are based on an instrumental-variable technique using lagged values of the explanatory variables as instruments.

[6] Other recent work, reaching similar conclusions, includes Fisher (1993a, 1993b). Corbo and Rojas (1995) find adverse effects of inflation variability on long-run growth.

expected to affect growth adversely through the distortionary effects of taxation. By contrast, government investment as well as defense and education spending add to productive resources (in the case of defense, presumably by safeguarding property rights) and thus, given the associated burden of taxation to finance them, would have ambiguous effects on growth. The empirical results are mixed. As expected, government investment has a positive and statistically significant partial correlation with growth, while government consumption net of defense and education has a correlation that is negative and significant. Neither education nor defense spending prove to be related to long-run growth in Barro's sample. Surprisingly, spending on transfer payments is positively related to growth, but Barro interprets this as an instance of reverse causation.

Subsequent work by Barro and an associate (see Barro and Lee 1993 and Barro 1996) has tended to confirm this negative effect of government consumption on long-term growth.[7] However, unlike the case of inflation, where the professional consensus is strong, the interpretation of these results remains open to question, primarily because of the potential for reverse causation. As pointed out by Slemrod (1995), to identify the separate effect of government size on economic growth an appropriate instrument is required— i.e., a variable that influences the demand for government services at a given level of income, but does not itself exert a direct influence on long-run economic growth. Such instruments have not been easy to find. Thus, while the negative partial correlation between government consumption and growth has been verified by many researchers, the interpretation of this finding remains ambiguous.

C. Commercial Openness and Economic Growth

The issue of the effect of commercial openness (trade liberalization) on economic growth is perhaps the most extensively treated in the literature of all of those to be discussed here. The theoretical links between openness and growth have been the focus of a substantial amount of work in recent years. Two mechanisms are worth mentioning. First, under conditions of financial openness, increased *commercial* openness, which results in a large domestic traded goods sector, may reduce the risk premium that external creditors require in order to lend to the domestic economy. This may result in a larger steady-state capital stock in the domestic economy and thus more rapid accumulation-driven growth during the transition. Exporting and importing, by increasing the domestic economy's exposure to new technologies, may also facilitate their adoption, and thus increase the rate of growth of productivity. The implication is that trade liberalization, which promotes commercial openness, should induce not just an increase in the *level* of income, but also, at least over some non-negligible horizon, an increase in its rate of growth. A substantial amount of empirical evidence supports this conjecture. It may useful to review three particularly important recent studies.

The first of these is by Dollar (1992), who considers a relevant definition of openness as one that combines a liberal trade regime with a relatively stable real exchange rate. He measures the effect of openness on growth by estimating a cross-country regression for 95 developing countries in which average economic growth over the period 1976-85 is taken to depend on the ratio of investment to GDP over this period, as well as on his measure of trade distortions and a measure of real exchange variability. The main result is that both increased trade distortions and increased real exchange rate variability have statistically significant and economically large negative effects on economic growth in this large sample of developing countries.

The second study is by Sachs and Warner (1995). This study considers what factors determine whether countries with low income per capita will achieve "convergence"— i.e., whether they will grow faster than richer countries, thereby permitting their living standards eventually to converge with the levels achieved by richer countries. Their methodology involves the classification of the 117 countries in their sample into two groups: those which safeguarded property rights and maintained commercial openness during the 1970-89 period (which they call "qualifiers"), and those which did not ("nonqualifiers"). Sachs and Warner conclude that safeguarding property rights and maintaining an open trade regime are not only conducive to growth, but constitute *sufficient* conditions for the attainment of rapid economic growth.

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[7] Engen and Skinner (1992) obtained similar results, while Easterly and Rebelo (1993) found negative growth effects of increases in marginal income tax rates, supporting the channel of influence from size of government to growth mentioned above.

Both of these studies leave open the direction of causality between growth and openness. There are several mechanisms that could imply a positive effect of growth on openness, or through which third factors would drive both openness and growth in the same direction. If these mechanisms account for the positive correlation between openness and growth documented in the literature, the case for outward orientation as a growth-enhancing policy would be weakened. A recent study by Frankel, Romer, and Cyrus (1996) addresses this issue by using a gravity model to instrument for openness in a cross-country growth equation. They confirm a strong positive correlation between the exogenous component of openness and economic growth, implying that much of the empirical evidence indeed reflects causation from openness to growth.

D. Financial Deepening and Economic Growth

Well-functioning financial markets can stimulate growth in a variety of ways. Most importantly, because economies of scale and scope tend to be associated with the functions of gathering information, monitoring performance, and enforcing contracts, specialized financial institutions tend to lower the costs of transforming savings into investment in a world in which information about prospective investment projects is costly. Pooling the assets of many savers also makes it possible for such institutions to fund high-return projects that may otherwise not be undertaken. For example, high-return projects may have longer gestations and/or be individually riskier than low-return projects. By pooling the assets of savers, specialized financial institutions can reduce the exposure of individuals both to liquidity risk and to idiosyncratic risk while financing such projects. In all these ways, a well-functioning financial system can enhance economic growth by increasing the productivity of new investment as well as installed capital. To the extent that such institutions make assets with more desirable risk-return characteristics available to savers, they may also increase the total volume of saving and investment.

Policies directed to the financial system, however, may inhibit the system from playing this growth-enhancing role. In particular, the set of policies typically identified under the general heading of "financial repression" has often been associated with a reduced scale of financial intermediation— i.e., with reduced financial depth. Many observers have claimed that such policies have consequently resulted in diminished savings mobilization and reduced the efficiency of investment, with attendant negative implications for economic growth. To test such assertions, recent research has explored the empirical relationship between financial "deepening" and economic growth, employing the methodology already described— i.e., estimating cross-country growth regressions in which other determinants of long-term growth are controlled for and in which alternative measures of financial depth appear as explanatory variables.

A particularly thorough effort has been made in a series of papers by King and Levine (1993a, b,c). They consider four alternative measures of financial depth (the ratio of liquid liabilities of the financial system to GDP, the share of total credit allocated by banks, rather than the central bank, the share of total domestic credit received by the private sector, and the ratio of credit to private enterprises to GDP). Then, using a sample of 77 countries with data over the 1960-89 period, they examine the extent to which such indicators contribute to explanations of long-term real GDP growth, the share of investment in GDP, and the rate of growth of total factor productivity, after controlling for standard growth determinants. The striking finding is that all of the financial depth indicators prove to be statistically significant, with economically large positive effects on the variable being explained, thus providing strong evidence of influences running between financial depth and both resource accumulation and productivity growth. Moreover, this association does not reflect reverse causation from growth to the financial indicators, because similar results are obtained when the initial (rather than contemporaneous) values of the indicators of financial depth are employed in the growth equations. Overall, then, the evidence linking financial depth to long-term economic growth, both through the incrementation of resource accumulation and through the enhancement of productivity growth, appears fairly strong in the cross-country record.[8]

E. Exchange Rate Unification and Economic Growth

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[8] Many other authors have obtained results similar to those of King and Levine. See, for example, Roubini and Sala-i-Martin (1992), as well as De Gregorio and Guidotti (1992).

Financial deepening is fostered through the removal of restrictions on domestic financial institutions associated with policies of financial repression. A separate set of restrictions on financial trades, applying to all classes of domestic economic agents, involves foreign exchange transactions. Restrictions on such transactions have taken a variety of forms, but perhaps the most common have involved capital account transactions in the balance of payments. In the past, countries have restricted the use of foreign exchange for capital account transactions for a variety of reasons, and have typically intensified such restrictions when domestic economic distortions have created strong incentives for residents to remove funds from the country— i.e., to engage in capital flight. In the presence of such incentives, private agents have sought to circumvent restrictions on capital movements by trading foreign exchange outside of official markets, giving rise to parallel exchange markets in which foreign exchange trades at a substantial premium over its official value.

The removal of restrictions on internal asset trades can potentially have important effects on economic growth. While the removal of restrictions on capital inflows can generate additional resources for investment, removing restrictions on outflows may paradoxically do so as well, by assuring foreign creditors that they will be able to repatriate their funds when desired, and by reassuring both domestic and foreign investors that their capital will be less subject to taxation. A more subtle effect of removing restrictions on flows is that the enhanced liquidity provided to domestic residents by increased integration between domestic and foreign financial markets may induce them to undertake less liquid but more productive investment projects than they would have done under financial autarky. Finally, financial integration may affect growth indirectly by fostering deeper domestic financial markets, thus reinforcing the growth benefits of financial deepening described above.

Cross-country evidence on the growth effects of easing foreign exchange restrictions on economic growth is of two types. The first involves the use of the premium on foreign exchange in the parallel market as a proxy for capital-account restrictions in cross-country growth regressions. The second involves assessing whether international financial integration affects economic growth through the indirect channel of promoting domestic financial depth. This involves testing whether measures of international financial integration can help explain cross-country differences in financial depth variables that are themselves related to long-run economic growth.

There are a large number of studies that include the parallel market premium as an explanatory variable in cross-country growth regressions, providing evidence of the first type. A particularly useful reference is Levine and Zervos (1993). This study is important because it specifically focuses on the growth effects of policies using a large cross-country sample (119 countries), and in testing for the effects of the parallel market premium, takes care to investigate the robustness of its role. Levine and Zervos find that the premium has a robust negative partial correlation with long-term growth— i.e., a correlation which survives under a wide variety of measures of policy distortions, including trade policy. The implication is that foreign exchange restrictions exert an independent negative effect on growth in the countries in their sample.[9]

Evidence of the second type is provided by De Gregorio (1996), who explains cross-country differences in a variety of measures of financial depth on the basis of a set of control variables (initial GDP per capita, the average rate of inflation, and a measure of commercial openness), as well as several measures of the degree of international financial integration of each of the countries in his sample. He finds that three of his measures of international integration have a statistically significant partial correlation with the measures of financial depth and interprets this as evidence in support of the indirect effect described above. However, he finds no evidence of a direct effect of openness on growth.

F. Applications to Latin America

All of the evidence reviewed up to this point has been based on large cross-country studies in which Latin American countries have been included, but which were dominated by countries outside the region. Consequently, the question arises whether empirical regularities observed in samples dominated by countries

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[9] Several of the studies cited previously have also found negative partial correlations between growth and the black market premium. See, for example, Fischer (1993a, 1993b).

outside Latin America apply with equal force to countries in the region. In other words, could Latin America simply be different?

One might think that there is no basis to believe so *ex ante*. In such diverse country samples, which include OECD countries as well as developing countries in East and South Asia, Africa, and Latin America, there is no reason in principle to believe that Latin American countries would be systematic outliers, and that the broad cross-country experience observed over many years would not apply to them. Nonetheless, one should not jump to such conclusions too quickly. Several researchers engaged in this line of investigation have indeed found that regional dummy variables added explanatory power to the cross-country regressions, suggesting that the variables typically included in cross-country growth studies not only do not fully explain cross-country differences in long-term economic growth, but specifically fail to capture the effects of certain influences that appear to operate at a regional level. Moreover, regional dummy variables have proved to be statistically significant in the case of Latin America, and the Latin American regional dummy has typically appeared with a negative sign, suggesting that countries in the region have typically underperformed as a group in regard to long-term growth.[10]

Nonetheless, even if a regional dummy were to prove statistically significant for Latin America, this would not necessarily imply that the effects of the policies reviewed above have been different in the region from what they have typically been elsewhere. Because country dummies capture a *level* effect, either or both of two sets of circumstances may exist: the coefficients of the explanatory variables differ between Latin America and other countries, or other region-specific growth determinants are missing from the equation. Moreover, even if some of the coefficients of the explanatory variables differ systematically for Lati n America, the coefficients to which this applies may not necessarily be those of the policy variables. Unfortunately, while the efects of policy variables on growth are uniform in Latin America and elsewhere can be checked by fairly straightforward statistical tests, we know of no studies that have conducted such tests.

An equivalent procedure, however, is to restrict the sample to Latin American countries and examine whether the types of conclusions derived from cross-country studies with respect to the effects of policies apply equally well within the restricted sample. A study of this type was recently conducted for Latin America by De Gregorio (1992). Relying on a sample of twelve Latin American countries in a panel data set, he found that typical cross-country results could be reproduced for countries in the region. While De Gregorio did not investigate the full range of policies considered above, he found that both macroeconomic stability and lower government consumption exhibited a positive partial correlation with long-term economic growth in Latin America, after controlling for other standard cross-country growth determinants. These results qualitatively reproduce those that other researchers have obtained for broader groups of countries, suggesting that if Latin America is indeed different, that difference does not appear to concern the qualitative marginal effects of macroeconomic reform policies, or at least that subset of such policies considered by De Gregorio. We expand on this important issue in the next section.

III. Has the Growth Response to Reform Been Disappointing?

The evidence summarized in the previous section suggests that the standard prescriptions of market-oriented macroeconomic reform have been associated with increased long-run economic growth in international experience. Thus, stabilization of the price level, commercial openness, the removal o f financial repression, the removal of restrictions on foreign exchange transactions, and more generally the achievement of a stable and sustainable macroeconomic environment do generally seem to be conducive to the acceleration of economic growth under a wide variety of country circumstances. The implication is that these measures should have been expected to accelerate growth in Latin America as well. Indeed, the recent history of macroeconomic reform in Latin America can be (and has been) described along precisely these dimensions. It is a reasonable expectation, then, that such reforms should have been associated, *ceteris paribus*, with an acceleration in the long-run rate of economic growth in Latin America.

However, the cross-country evidence of the previous section is informative only about the marginal growth impact of a given reform, i.e., the sign and magnitude of $(a+a)$. To assess whether the recent growth experience in Latin America has been consistent with this evidence, we also need to know the magnitude

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[10] See, for example, the early study by Barro (1990).

of reform in Latin American countries, i.e., the value of r. Moreover, there is only so much we can learn about the growth payoffs of macroeconomic reform during any specific period of time from cross-country growth regressions. At least two important elements are missing from regressions of this type. First, because such regressions are static, they cannot inform us about the *dynamics* of the growth response. Though they may tell us whether it is reasonable to expect long-run growth to improve following a specific set of macroeconomic reforms, we do not learn how soon after the implementation of such reforms the acceleration of growth can be expected to become manifest. Second, to the extent that growth during a given period is affected by time-specific factors with no cross-country variation, the influence of such factors on growth cannot be picked up by cross-country regressions. Changes in the international macroeconomic environment are the most important such factor in this case. Dynamics of both types are essential for the evaluation of hypothesis (2).

A recent paper by Easterly, Loayza, and Montiel (ELM, 1996) addresses some of these problems. ELM are specifically concerned with the issue of whether Latin America's recent growth experience has been disappointing, in a very specific sense— i.e., has the response to reforms in the region during recent years been consistent with the international evidence reviewed in Section II? To address this issue they estimate the relationship, based on data from a sample of 69 countries, between changes in growth and those in a broad set of explanatory variables: a set of variables intended to measure the extent of macroeconomic reform (i.e., representing the set x_1 in the appendix), a set of variables consisting of the standard basic cross-country explanatory variables (such as initial GDP per capita and initial levels of educational attainment),), and external variables. The external variables could be included despite their lack of cross-country variation because ELM base their estimation on a panel data set, using five-year averages of contemporaneous variables.[11] The reform variables were chosen to capture to the greatest extent possible the breadth of macroeconomic reform in Latin America using specific empirical representations consistent with the empirical cross-country growth literature reviewed above. These variables include the rate of inflation, the share of government consumption in GDP, the ratio of broad money to GDP, the ratio of external trade to GDP, and the black market premium on foreign exchange.

ELM's strategy is to estimate the growth equation with the largest available international data set (thereby estimating the "expected" effects on growth of individual reform variables, based on international experience) and to calculate the corresponding fitted values for Latin American countries during the reform period (1991 to 1993 in their sample). This procedure makes "expected" changes in growth conditional both on the best available evidence about the effects of reform measures on growth and on the actual magnitude of reforms in the countries concerned. Their final step tests whether these expected values are statistically distinguishable from the actual growth performance of these countries during the reform period[12] Growth performance would be "disappointing" if these residuals are negative and statistically significant.

ELM find that the growth response to reform in Latin America, i.e., the effects of macroeconomic reforms on economic growth acceleration, has in fact not been disappointing during the reform period. Given the estimated effects of the reform variables on economic growth, the actual changes that the values of the reform indicators have undergone in Latin America during recent years, and the estimated effects on growth of changes in the external environment, the change in the observed rate of growth in the region was not statistically different from what would have been predicted. Their conclusion is that if growth in Latin America has not accelerated to desired levels in the post-reform era, the reason has been that the magnitude of reform, in part hidden by an abnormally negative external growth environment, has been insufficient to achieve this objective.

IV. Reexamining the Evidence

The question ELM answer, i.e., whether the growth response to reform has been disappointing, is not designed to fully test hypotheses (1)-(4) in which we are interested. To see this, it is useful to cast these results in terms of the hypotheses considered above. ELM address the usefulness of market-oriented policy questioned in hypothesis (1). By quantifying the growth effects of changes in the external environment, they also address one of the possible justifications for the "sit tight" policy strategy associated with hypothesis (2).

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[11] Not all such variables lack cross-country variation, of course. For example, changes in the terms of trade are country specific.

[12] For the region as a whole, this amounts to examining the size and statistical significance of a regional dummy.

Indeed, they find that the external environment was relatively adverse during the period 1991-93, and this may account for part of the disappointment regarding growth performance in the region during these years. Similarly, the quantification of the growth response to policy changes addresses issues raised in association with hypothesis (3). However, there is no indication about the growth payoff that can be achieved by deepening the macroeconomic reforms. Furthermore, hypothesis (4) described in the introduction on the scope of reform is not addressed because ELM's analysis is conducted in terms of the growth response to changes in explanatory variables, which eliminates from consideration cross-country structural differences that may be important to explain growth levels. Finally, possible interactions between macroeconomic policy and structural country characteristics are not addressed directly because ELM do not test the standard panel assumption of parameter constancy across regions.[13]

There are also limitations within the confines of the questions the analysis is designed to answer. While their analysis incorporates both the effects of the actual magnitude of reform and the influence of external macroeconomic variables on growth during the reform period, thus handling two of the three issues alluded to above, it does not address the dynamics of the growth response, implicitly assuming that a five-year period is sufficient for the long-run implications of changes in the explanatory variables to become manifest. Moreover, limitations in data availability restrict the reform dimensions explicitly analyzed (e.g. tax reform is not directly addressed) and also limit the period of observation during the reform period to only three years.

Dynamic reform effects may matter in two ways. The fundamental issue is whether long-run growth effects can be captured over a five-year period. First, to the extent that periods *at least* five years in length are necessary to capture the effects of reforms on long-run growth rates, the truncation of the reform period for Latin America after three years is problematic. It implies that the observed growth rate for countries in the region may still contain some transitory effects. Depending on the nature of the dynamic process triggered by the reforms, such effects may either overstate or understate the beneficial effects of macroeconomic reforms on long-run growth. If the adoption of reforms triggers a short-run boom in economic activity, for example, then actual growth rates in the region during 1991-93, however disappointing they may have been to observers, may actually have *overstated* the long-run growth effects of the reforms.[14] This would call into question ELM's conclusion that the macro economic reforms worked as advertised. Thus the inclusion of recently available data is of particular importance in this context.

On the other hand, if even a five-year period is not sufficient to capture the long-run effects of the macroeconomic reforms, then the growth equations estimated by ELM would have been misspecified by omitting lagged values of the reform variables. This possibility is testable. If valid, it has the important implication that future growth performance will differ from current performance, even if no further reforms are enacted. Depending on the direction of this effect, it may provide a justification to sit and wait or it may be a reason for concern regarding future growth. It may call for either less or more policy response to a growth performance that is deemed inadequate, compared to a situation in which long-run growth effects materialize within a five-year period.

Finally, ELM, and the empirical panel literature in general, utilize a relatively short list of macroeconomic policy reform outcomes to capture the growth impact of a wide range of reform policies. It is clear that the direct measurement of policy instruments would be preferable. While many policy stances can be expected to be proxied reasonably well by their predictable and easily measured outcomes, some potentially important reforms, such as tax reform or even trade reform, may not be adequately captured. The lack of broad and consistent information on actual policy instruments has precluded their use in the empirical panel literature. However, Lora (1997) has recently produced a Structural Policy Index for most Latin American countries over the last decade that may contain important additional information to incorporate into the statistical methodology.

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[13] While the E L M finding of statistically insignificant country residuals suggests that parameter stability may hold in their sample, this may not be true, if for example, negative residuals are hidden by short-run booms. Thus, direct tests of hypothesis (4) in this context may be worth pursuing, especially if the E L M result that regional growth acceleration during the reform period is consistent with the model's prediction does not prove to be robust.

[14] Such a boom may emerge in the data because reforms are typically undertaken from very unfavorable initial macroeconomic conditions, permitting a brief period of catch-up growth that reflects improved capacity utilization rather than expansion of productive capacity. See Inter- A merican Development Bank (1996).

In order to fully address the various hypotheses of interest, this section will consider a growth model that accounts not only for growth responses to reform but also for growth levels. It will also take up the previously mentioned extensions, applying econometrics analysis to the same panel of countries to test the robustness of ELM's conclusions on whether the growth response is disappointing in light of such modifications. We group these extensions into three parts, taking up one extension at a time. In the first part, the ELM data set are extended to 1995, thereby allowing the long-run growth effects of reform to emerge within a time interval consistent with that of the estimation, and examine whether the partial effects of individual reform policies in Latin America are disappointing or the same as elsewhere. In the second part, we allow the effects of macroeconomic reforms to emerge over a longer time period, by incorporating lagged effects for the policy variables. Finally, we incorporate the information contained in the Structural Policy Index and analyze whether the conclusions change. As a result, we will be able to judge the accuracy of the various hypotheses.

A. Statistical Methodology

The panel utilized involves ELM's sample of 69 countries, 18 of which are in Latin America, in the period 1961-1995. This is the largest panel for which relevant information is available. The use of a large panel of countries during an extended period of time allows us to attain sufficient accuracy to estimate the long-run effects of Latin America is recent macroeconomic reform despite the short span of reform experiences in the region. In particular, this approach permits the elimination of short-run business cycle dynamics through averaging over time, a method which is generally unavailable to small panel studies due to small sample limitations. Failure to eliminate short-run dynamics typically leads to highly correlated time series and to gross overestimation of true statistical accuracy, which is bound to be low due to insufficient sample size.[15] Another advantage of large panels is the possibility of incorporating a large number of explanatory variables, including lagged variables to analyze dynamics, without an important loss of precision. Consequently, we divided the period into seven five-year subperiods, two per decade, and consider five-year averages when appropriate, both contemporaneous and lagged.

In order to focus on the growth effects of a number of macroeconomic policy reform variables, we control for structural differences across countries with country-specific intercept terms ("fixed-effect" model), without attempting to identify their nature. Consequently, the resulting estimation of the growth contribution of reform is conservative because permanent cross-country differences are not attributed to policy reform differences.[16] Since investment is not included as an explanatory variable, growth effects should be interpreted as overall effects, inclusive of effects channeled through the level of investment. We als o control for worldwide fluctuations in growth resulting from technological, financial, or other reasons, as well as traditional cross-country growth variables.

In contrast to ELM, our estimation procedure is based on the levels of the explanatory variables rather than changes, which enables us to identify the magnitude of structural growth differences across countries and to decompose growth rates in the next section. Since the panel includes non-Latin American countries, we are able to analyze the growth gaps between Latin America and other regions and gain a different perspective on the contributions of policy reform, used to examine hypotheses 3 and 4 on the magnitude and scope of reform. At the same time, changes in growth over time can also be analyzed by deriving the corresponding estimated model in change form. Therefore this specification is more general.

Estimations in this study were obtained using Ordinary Least Squares (OLS) to fit a growth equation with country-specific intercepts. The appropriateness of OLS estimation was checked relative to Instrumental Variable methods using a Hausman specification test. A random effect model was also tested and rejected as an alternative to the fixed effect model. Zero serial autocorrelation of residuals was checked with a panel-adjusted Durbin-Watson statistic, and therefore the reported accuracy of the estimations is reliable. See appendix for detailed information on data and statistical analysis.

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[15] Such a boom may emerge in the data because reforms are typically undertaken from very unfavorable initial macroeconomic conditions, permitting a brief period of catch-up growth that reflects improved capacity utilization rather than expansion of productive capacity. See Inter- American Development Bank (1996).

[16] In contrast, purely cross-country studies, cannot control for structural country-specific differences unless untestable statistical assumptions are made to justify a "random-effect" model, i.e., the uncorrelation between the structural terms and the explanatory variables. Within the context of our panel, such assumptions are testable and were statistically rejected. This result suggests that estimations based on random-effect growth models may be biased.

B. Extending the Reform Period

The main conclusion reached by ELM, namely that the growth response to recent reform in Latin America is well within what international experience would lead us to predict, is confirmed when the sample period is extended to cover 1994 and 1995. More generally, the statistical results (displayed in Appendix Table 1, specification 1) are broadly similar to those obtained by ELM. This similarity also validates the simpler statistical methodology used in this report. The similarity of results relative to ELM, who use instrumental variable estimation, gives additional confidence in our own instrumental variable-based test and suggests that reverse causation and other sources of bias are not serious problems.

We find a substantial and statistically significant marginal growth impact associated with stabilization and structural reform variables: lower public consumption, lower inflation, financial deepening, and exchange rate unification.[17] Nevertheless, the combined overall effect is far more reliable than the associated four-way decomposition, which would be subject to significant inaccuracy. For this reason, this study reports only on the overall impact of the stabilization and reform package. Control variables have the expected sign, positive for education and terms of trade change, and negative for initial per capita GDP.[18]

Worldwide growth fluctuations are substantial and statistically significant. In particular, the external growth environment in the 1990s appears to be about as negative as in the first half of the 1980s, when the debt crisis hit— down by about one percentage point relative to the second half of the 1980s. This finding is consistent with other studies and also with casual observation: relative to the previous quinquenium, growth slowed down in all regions, including East Asia, except in Latin America. Not only African, but also OECD growth slowed down by more than one and a half percentage points.

Within this model, it remains true that there is no reason for disappointment with the growth response to the 1990s reform. The growth increase in Latin American countries during the first half of the 1990s, relative to the second half of the 1980s, actually exceeds what should be expected according to these estimations (by about 1.3 percentage point on average). It also remains true that the full extent of the underlying growth progress due to reform is partially hidden by a worldwide growth downturn of about one percentage point. If expectations do not take into account the world growth cycle, the post-reform growth acceleration would be below expectations.

The overall conclusion is that there is no evidence suggesting that the growth response to reform in Latin America is small (contrary to hypothesis 1) or smaller than elsewhere (contrary to one of the variants of hypothesis 4). Finally, two additional tests further confirm this conclusion. First, the hypothesis that the coefficients of the four policy variables in Latin America were equal to those in the other regions in the panel was directly tested and checked. Second, the evidence indicates that growth in the region in the late 1980s is well explained by the model but that it significantly exceeded what the model predicted for the 1990s.[19] In other words, the evidence shows that according to this model recent reform in Latin America led to surprisingly fast growth.

C. Dynamics

Stabilization and structural reform typically set in motion complex business cycle dynamics. If some of the growth effects are felt only after a long delay, then the above estimations based on five-year averages would underestimate the effect of reform. On the other hand, if five years are not enough to eliminate short-run fluctuations it may very well be that long-run effects are overestimated.[20] Furthermore, growth theory

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[17] However, our measure of openness (real imports plus exports as a share of GDP) is not statistically significant. Our analysis shows that this result is driven by African countries and may be associated with compensatory foreign financial aid. However, the evidence also suggests that the growth effect in Latin America from this source may be short-lived. We chose to eliminate openness as an explanatory variable and capture it through the Structural Policy Index, as discussed later.

[18] The so-called "speed of convergence" parameter associated with the latter is well within traditional estimations.

[19] The average residual was more than 0.5 percentage points. A Latin American dummy for 1991-95 captures almost 1 percentage point and is statistically significant at conventional confidence levels.

[20] If, for example, as established in Inter-American Development Bank (1996), short-run economic booms follow stabilization and structural reform.

suggests that macroeconomic policy has, at least to a partial extent, an income level effect that translates into a transitory growth effect.

The previous hypotheses were tested by introducing the reform variables in the previous period as explanatory variables in the growth equation (see Appendix Table 1, specification 2). The long-run effect of reform, that is, the effect that would prevail if reform were sustained, is given by the sum of the contemporaneous and the delayed impacts. If the latter is positive, additional growth would occur effortlessly. If negative, some of the growth gains would be lost in the future.

The estimated delayed effects of reform were all negative but small in absolute value, leaving substantial positive long-run effects for each one of the four reform variables: lower public consumption, lower inflation, financial deepening, and exchange rate unification. None of the delayed effects was clearly statistically significant individually, but they were strongly significant jointly. The interpretation of this result is that the evidence indicates the presence of a partial offset of the beneficial growth effect of stabilization and reform after five years, which is consistent with the cyclical patterns found in Inter-American Development Bank (1996).

The conclusion is that if hypothesis 2 is correct and we only have to sit and wait, it is certainly not because of delayed policy effects. It could be correct because of temporary effects of the international environment. If sufficiently important, such effects could explain differences in growth performance with Latin America's past, but would not be a factor in explaining the growth gap with East Asia, which experienced the same adverse external conditions. The decompositions of growth rate gaps will be taken up in Section V. Rather than selecting the subset of lagged variables that appear more important, which is bound to be an unreliable exercise, it is preferable, for the purpose of estimating the overall dynamic effect and long-run effect of reform in Section V, to keep them all.

This dynamic specification improves upon the static one according to standard statistical measures as well as with regard to the qualitative features of the results.[21] With this new dynamic specification, growth in the 1990s is within what the model would predict.[22] Importantly, the conclusion that the growth response to reform in the 1990s has not been disappointing in the sense of ELM still holds. In fact, taking into account policy dynamics, the observed growth acceleration in Latin America still exceeded expectations by an average of more than 0.4 percentage points.

D. Extending the Reform Coverage

Finally, the information included in the Structural Policy Index is incorporated in order to achieve a more comprehensive coverage of reform policies. Unfortunately, the index for Latin America is only available for 1985-1995, and therefore only covers a small fraction of the panel. Therefore, statistical assumptions are needed in order to complete the missing information. (See Appendix Table 2 for the corresponding estimations under two alternative assumptions).

To the extent that reforms are interlinked and coordinated, it may be expected that the four macroeconomic reform variables used above already capture effects that truly belong to other reforms, previously omitted but included in the index. If so, this is an additional argument against attributing specific contributions to individual policies based on the previous econometric results. Regarding overall reform effects, the relevant question is how much information is in the index that is not already being captured by the existing explanatory variables. A statistical analysis of the relationship among the index and the four macroeconomic reform variables over the past decade in Latin America suggests that there is in fact a close association among them. A predictive function based on these four variables can account for about half of the time variation in the index. (For details on the statistical analysis of the Structural Policy Index, see appendix).

The first alternative statistical assumption (Assumption A) is that when the index is not available, it can be closely approximated by the above-mentioned function of the four reform variables (and arbitrary country-specific structural differences to control for cross-country structural differences). Under this

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[21] The adjusted R-squared increases from 0.56 to 0.60. Also, education is now more important and statistically significant.

[22] A Latin American dummy for 1991-95 still obtains a positive value but is statistically insignificant at conventional confidence levels.

assumption, the additional reforms included in the index make a statistically significant contribution to growth (see Appendix Table 2, specification 3). This new specification does not have much effect on estimated coefficients or the overall fit but has some effect on raising expected Latin American growth in 1991-95, thus explaining more of the acceleration with respect to the previous quinquenium than the equation that excludes the index.

The second alternative statistical assumption (Assumption B) is that when the index is not available, it remains constant over time. In a sense it is the opposite assumption from the one above: instead of perfect coordination with the four reform variables, no coordination is assumed. For countries in Latin America, the constant value is that observed in 1985. For other countries, the constant index level is arbitrary. Under this assumption, improvements in the index also make a statistically significant contribution to growth, as shown in Appendix Table 2, specification 4. This alternative totally eliminates the excess of observed Latin American growth, but, even under this extreme case, the growth response to reform remains not disappointing.

The overall conclusion is that the Structural Policy Index contains useful information. However, since the validity of the inferences also depend on untestable statistical assumptions, the results and the implications for hypotheses 3 and 4 need to be taken with caution. The decompositions of growth gaps presented in the next section are based on a model that incorporates the Structural Policy Index under the coordination assumption (Assumption A), under which the four macroeconomic reform variables in the model already capture much of the index. This case appears to be intermediate between the exclusion of the index and its incorporation under the no coordination assumption. The conclusions in the cross-region decompositions are robust to the alternatives. Regarding decompositions of Latin American growth over time, the results for the three alternatives are presented side by side.

V. Accounting for Reform Effects

The previous results can be used to estimate the permanent, long-run growth effect of macroeconomic reform. To understand the growth payoff of economic reform in Latin America, the results of the previous section can be also be used in a growth accounting exercise. The question to be posed here is the following: consider some absolute standard of growth performance, say average Latin American per capita growth rates during the period prior to the recent reform or average East Asian growth levels during the Latin American reform period. How can the shortfall between such a standard and the actual growth experience be explained in terms of the growth determinants we have identified? We address these issues in turn.

A. Long-run Growth Effects

To quantify the long-run contribution of stabilization and structural reform in the 1990s to per capita growth acceleration in Latin America, the long-run marginal effect $(a+a)$ needs to be applied to the change in the reform variables. Table 1 shows these estimations as additional percentage points in annual growth on a country-by-country basis, as well as their sensitivity to the aggregation method and the statistical assumptions used for incorporating the Structural Policy Index. The preferred specification is the one in which the Structural Policy Index was introduced under Assumption A, which is the basis for the following decompositions in this study. To the extent that reforms do not affect population growth, the best estimation of growth effects in the region as a whole is obtained through the GDP— weighted average of country growth effects, as opposed to a population-weighted average (see Appendix). By this method, the contribution of stabilization and structural reform to aggregate long-run growth is 1.84 percentage points per year. Other methods yield roughly similar results. In almost all countries it is estimated that stabilization and structural reform made a substantial contribution to long-run growth as measured by all of the estimation methods.

Table 1. Long-run contribution to annual growth rate of the macroeconomic reform of the 1990s.

Country	Long-run Contribution of Stabilization and Structural Reform		
	Excluding Structural Policy Index	Including Structural Policy Index	
		Assumption A	Assumption B
Argentina	2.89	3.09	4.62
Bolivia	1.25	0.85	2.03
Brazil	0.73	1.42	1.21
Chile	0.60	0.34	0.73
Colombia	0.34	0.75	0.61
Costa Rica	-0.14	1.16	0.20
Ecuador	1.30	2.16	2.20
Guatemala	1.38	2.57	2.22
Honduras	0.87	2.12	0.74
Haiti	1.10	-1.62	0.67
Jamaica	0.53	1.85	0.98
Mexico	0.93	1.73	1.84
Peru	4.07	4.07	6.08
Paraguay	0.30	1.46	0.97
El Salvador	3.70	2.28	4.39
Trinidad and Tobago	1.16	2.80	1.97
Uruguay	0.89	0.78	1.67
Venezuela	1.62	1.52	2.00
Typical Country (Average)	1.30	1.63	1.92
GDP-weighted Average	1.31	1.84	2.17
Population-weighted Average	1.19	1.70	1.92

Therefore, the conclusion that recent stabilization and structural reform made a significant contribution to sustainable growth appears to apply to almost all individual countries and to be robust to these alternative methodologies. In the aggregate, this long-run contribution is estimated at around 1.8 points of annual growth, which is enough to double expected real income in 40 years.

In the long run, if reforms are sustained, some of the current gains will be lost due to negative policy dynamics. If the reform level in 1996-2000 equaled that of 1991-95, there would be an estimated aggregate dynamic per capita growth loss of 0.2 percentage points. Fortunately, the current depth of reform is larger than that five-year average. If reform is maintained at the 1995 level, the most current information available, this loss relative to 1991-95 performance is reverted into an actual gain of around 0.2 points. All things considered, it appears that the significant contribution of recent macroeconomic reform to the 1990s growth can be expected to persist intact in the near future. Improvements in the adverse international growth conditions would help to accelerate growth further even in the absence of deeper or broader reform.

B. Latin America versus Its Own Past

The difference between average Latin American growth performance during the reform period 1991-95, denoted by g_1, and average Latin American growth performance in the previous period, denoted by g_0, can be expressed as follows:

$$g_1 - g_0 = [r_1^* - r_0^*] + [c_1^* - c_0^*] + [w_1^* - w_0^*] + [(g_1 - g_1) - (g_0 - g_0^*)]$$

where $g_1^*=[r_1^*+c_1^*+w_1^*]$ and $g_0^*=[r_0^*+c_0^*+w_0]$ are the fitted values of the "preferred"growth equations form Section IV, using average values of explanatory variables in the last quinquenium and the previous period, respectively. The first two terms on the right hand side of this equation capture the "explained"portion of any Latin American growth change. In other words, they measure the extent to which Latin America's growth change can be explained by the variables that have been influenced by macroeconomic reform (denoted by r) and systematic differences in the set of "control"variables (denoted by c). The next term capture s differences in the effects of the worldwide cycle (denoted by w, which can be interpreted as an exogenous temporary shock). This term captures the extent to which worldwide growth trends in both periods— i.e. unaccounted international factors related to growth, such as the debt crisis or productivity of new inventions— account for differences in growth performance in Latin America. The last term corresponds to the difference between Latin American growth residuals in both periods -- i.e., the random (and transitory) portion of the difference in growth performance between the two periods. This final term captures the extent to which Latin America's recent growth response has been disappointing, in the sense of falling short of what could reasonably have been expected on the basis of international experience.

   Aggregate per capita growth can easily be calculated if country growth rates are aggregated based on either their GDP or their population at the cost of some inaccuracy. For example, within the sample, Latin America annual per capita growth in 1991-95 was 1.54, while the GDP-and population-weighted averages were 1.68 and 1.47, respectively. However, to the extent that population growth is not affected by the explanatory variables considered in this growth model, GDP-weighted averages exactly identify the aggregate growth contributions of these variables in all the growth gap decompositions analyzed in this study (see appendix)[23]. On this basis, aggregate per-capita growth increased by about 1.9 percentage points (see Table 1). That increase is essentially due to stabilization and structural reform in 1991-95, the impact effect of which (current reforms) is estimated at 2.0 percentage points. Growth acceleration due to macroeconomic reforms as well as some marginal improvements in education are partially clouded by a strong worldwide growth downturn of more than 1 percentage point. However, transitory growth shocks in Latin America have favored a growth rate increase, so that observed growth acceleration approximately coincides with the contribution of macroeconomic reform in the 1990s. A similar picture emerges from regional per-capita growth aggregation based on population.

Table 2. Decomposition of annual per capita growth rate gap
(Latin America: 1991-95 compared to 1986-90)

	Typical Country (Average)	Regional Aggregate (GDP-Weighted Average)	Regional Aggregate (Population-Weighted Average)
Stabilization and Structural Reform	1.88	2.21	2.03
Current Reform	1.95	2	1.85
Past Reform	-0.07	0.21	0.17
Control Variables	-0.11	0.19	0.16
Initial GDP	-0.05	0.04	0.02
Education	0.07	0.18	0.14
Terms of Trade	0.09	-0.03	0.00
Other Factors	0.9	-0.48	0.59
Worldwide Cycle	-1.09	-1.09	-1.09
Transitory Differences	0.19	0.61	0.5

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[23] Remaining statitical discrepancies are due to demographic factors.

Growth Rate Gap	1.09	1.92	1.60

C. Latin America versus East Asia

A key advantage of panels including extra-regional countries is that they allow cross-regional comparative analysis. The decomposition of the difference between average growth performance in Latin American and other regions during the reform period 1991-95 can also illustrate the role of recent reform and the remaining reform agenda needed to close the gap. Suppose for concreteness that the East Asia region is taken as a benchmark. The difference between average East Asian growth performance during this period, denoted by g_{EA}, and Latin American growth performance, g_{LA}, can be expressed as follows:

$$g_{EA} - g_{LA} = [r_{EA}^* - r_{LA}^*] + [c_{EA}^* - c_{LA}^*] + [s_{EA}^* - s_{LA}^*] + [(g_{EA} - g_{EA}^*) - (g_{LA} - g_{LA}^*)]$$

where $g_{EA}^* = [r_{EA}^* + c_{EA}^* + s_{EA}^*]$ and $g_{LA}^* = [r_{LA}^* + c_{LA}^* + s_{LA}^*]$ are the fitted values of the preferred growth equations from Section IV, using average values of explanatory variables for East Asian and Latin American countries, respectively. Again, the first two terms in the right hand side of this equation capture the explained portion of any Latin American growth shortfall. In other words, they measure the extent to which Latin America's growth performance can be explained by the variables that have been influenced by macroeconomic reform (denoted by r) and systematic differences in the set of control variables (denoted by c). The next term captures differences in regional averages of country dummies (the structural differences s). This term captures the extent to which structural features of economies in the two regions— i.e., features which have been constant for some time and which are related to growth performance—account for differences in growth performance during Latin America's reform period. The last term corresponds to the difference between East Asian and Latin American growth residuals— i.e., the random (and transitory) portion of the difference in growth performance between the two regions in 1991-95. This final term would also capture the extent to which Latin America's recent growth experience h as been disappointing, in the sense of falling short of what could reasonably have been expected on the basis of international experience.

Table 3. Decomposition of annual per capita growth rate gaps between Latin America and other regions (1991-95)

	East Asia versus Latin America		OECD versus Latin America	
	Typical Country (Simple Average)	Regional Aggregate (GDP-Weighted Average)	Typical Country (Simple Average)	Regional Aggregate (GDP-Weighted Average)
Stabilization and Structural Reform	**1.40**	**2.52**	**-0.17**	**1.92**
Current Reform	1.78	3.14	-0.23	2.24
Past Reform	-0.38	-0.62	0.06	-0.32
Control Variables	**-1.20**	**0.19**	**-6.65**	**-5.61**
Initial GDP	-1.54	-0.33	-7.46	-6.65
Education	0.25	0.52	0.7	0.95
Terms of Trade	0.1	0.01	0.12	0.08
Other Factors	**4.74**	**1.87**	**6.17**	**3.00**
Structural Differences	2.77	0.56	6.44	3.71
Transitory Differences	1.98	1.31	-0.27	-0.71
Growth Rate Gap	**4.95**	**4.58**	**-0.64**	**-0.70**

For the Latin American region as a whole, most of the enormous growth gap with East Asia of almost five percentage points is explained by incomplete reform (hypothesis 3). According to these measures, if Latin America reached East Asia in growth the per capita growth gap would shrink in the long run by two and a half points. By these measures, such additional reform effort is comparable to the one already made in the 1990s. The educational deficit in Latin America is responsible for about half a point of the growth gap, most of which is offset by the region's relative poverty that, everything else equal, facilitates growth (conditional convergence). Structural differences also contribute to the growth gap but appear to be less important.

In contrast, OECD per capita growth in the 1990s was slower than Latin America's. Given the enormous difference in income per capita, reflected in the growth contribution of GDP per capita in Table 3, this is not surprising. What is perhaps surprising is that differences in reform make a smaller contribution in favor of the OECD than in the East Asian case. At the same time, there are very significant structural differences in favor of the OECD countries (almost four percentage points); these are more important than the contribution of stabilization and structural reform, estimated at less that two points, which probably reflects the large differences in the stages of development of both regions. Coupled with this observation, the significant East Asian growth residual suggests that part of the contribution assigned to transitory factors in East Asia may be permanent in nature and that East Asia may be following the steps of OECD in this regard. The overall analysis of both decompositions suggests that, for the Latin American region as a whole, there is a significant growth advancement to be made if reforms, including educational policy, are deepened. Attaining East Asian levels would substantially close the Latin America growth gap with the East Asian region

and possibly set the stage for other structural transformations as development is advanced and the gains from the first generation of reforms are completed.

This study does not directly address the structural factors underlying the significant permanent growth differences across countries accounted for by structural country effects. However, preliminary results obtained from statistical explanations of these structural differences indicate that the volatility of international terms of trade and the inequality of income distribution significantly reduce growth and explain more than one third of the country effects variation (see appendix for details).[24] Since Latin America appears to be more volatile and more unequal than East Asia and OECD, this empirical finding suggests that these may be some of the clues explaining relatively low growth in the region. Importantly, this finding confirms hypotheses previously advanced and analyzed in Inter-American Development Bank (1996). More research is needed to further identify the structural obstacles to development and derive the corresponding policy implications.

D. Growth Decompositions and Traditional Growth Accounting

Finally, a word should be said on the role of investment and savings in economic growth. It is well known that investment-GDP ratios in Latin America are significantly lower than in East Asia. Within this panel, in 1991-95 the aggregate investment ratios differed by 17 percentage points: Latin America invested 20% and East Asia 37% . Traditional growth accounting exercises, which decompose GDP growth into factor accumulation and productivity growth, identify differences in investment effort as the key explanation behind growth gaps between the regions. The overall conclusion that emerges from these studies as they apply to Latin America is that, in a sense, a high investment ratio is the key to fast growth. An important implication is that higher domestic savings ratios appear indispensable for most Latin American countries.[25] The prediction as well as the lesson from experience is that satisfactory growth requires sacrifices in consumption.

The present study enriches the perspective of traditional growth accounting by analyzing the underlying factors explaining the evolution of investment and productivity, which are two key proximate sources of growth. The per capita growth impact and per capita growth decompositions presented in the last two sections should be interpreted as overall growth effects, which may be channeled through the level or productivity of investment. In no way does this study contradict the conclusions of traditional growth accounting.

It is important to recognize that market economies that invest a larger proportion of their resources do so because they have a larger set of profitable investment opportunities. Therefore, deeper market-oriented reform can be expected to lead to higher investment and savings. High investment will not occur without high returns to investment. Nor would it be advisable to subsidize investment for the sake of accelerating growth unless there is a market failure that requires policy intervention. Artificially investing beyond the opportunities actually generated by the economy is a wasteful proposition that leads to immiserizing growth. In the end, the public policy recommendations still boil down to expanding and improving markets, and facilitating the provision of complementary factors such as infrastructure and social services.

VI. Conclusions

To summarize our findings, it is useful to go back to the alternative hypotheses offered at the outset to explain Latin America´s recent growth performance. It is clear that the weight of the evidence in the professional literature supports the view that the market-friendly reforms implemented in the region to date should have been growth enhancing. The empirical evidence puts the burden of proof on those who would argue that the thrust of the reforms has been fundamentally misguided. Moreover, our own empirical evidence supports the view that the reforms were growth enhancing. First, we have found no evidence that

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[24] However, the effect of the volatility of inflation is not statistically significant. The evidence also indicates that changes in volatility and income distribution over time are not significantly correlated with the transitory effects accounted for by the growth residuals.

[25] In theory, foreign capital could finance any savings shortfall. The need for adequate domestic savings results from the constraints and risks associated with such development strategy (see Fernández-Arias 1995).

the growth response to the reforms variables for which we had cross-country evidence— i.e., the four macro reform variables— have been systematically different in Latin America from elsewhere, implying that the cross-country evidence on the growth effects of market-oriented reforms is indeed applicable to Latin America. Second, the estimated long-run growth effect of the 1990s reform is substantial for most countries in the region and amounts to almost 2 points of additional annual sustainable growth in the aggregate, enough to double the real income expected in 40 years (Table 1). Third, in the growth decomposition that compares the experience of Latin America during the reform period with that of its own immediate past, the change in the stabilization and reform variables in the aggregate contributed more than 2 points of additional annual GDP growth (Table 2). That this is the magnitude of the growth boost that should have been expected from the reforms implemented during this period is suggested by the observation that a time and region specific dummy for the reform period in Latin America was statistically insignificant when added to the panel growth equations on which these growth decompositions were based. In other words, consistent with the findings of ELM, we found no evidence of disappointing growth performance when disappointment is measured in terms of the *marginal* effects of the reforms — i.e., relative to what the reforms actually implemented could reasonably be expected to have produced as a growth dividend on the basis of international experience.

Why, then, did Latin America not experience a more pronounced acceleration of growth in 1991-95? The answer appears to lie in a combination of hypotheses (2) and (3). First, the reforms were implemented in a relatively unfavorable international environment. The effect of implementing the reforms in 1991-95, instead of in the previous five-year period, was to associate them with an international context which by itself reduced the average growth rates of the reforming countries by about one percentage point. This deterioration in non-reform growth determinants tended to mask the underlying boost to growth provided by the reforms. The good news, however, is that to the extent that this effect is cyclical, and thus transitory, future growth would be expected to show some improvement in the region, even in the absence of intensified reform. More good news emerges from our rejection of another potential component of hypothesis (2). Though we found some evidence of an initial boom associated with the reforms (that is, of an initial overshooting of the favorable growth effects of reform), the boom turned out to be quite small in magnitude, so that long-run effects appear to be well captured within the five-year span of our last observations.

The implication is that the growth boost that the reforms have provided during the last five-year period are not transitory. This being said, however, our evidence is consistent with aspects of both hypotheses (3) and (4). Regarding the former, it is tautologically true that, conditional on the international environment, and even though the reforms provided an important boost to growth, for growth to have accelerated more than it did would have required more intensive reforms along the lines already implemented. However, we found evidence that there is indeed room to move further in this direction, in the sense that Latin America has not yet reached the levels of performance achieved in faster-growing regions. In this regard our results would also support a case for more extensive structural and institutional reforms— that is, for broadening the scope of reform— because pushing macroeconomic reforms to the levels of performance achieved in the faster-growing regions would be insufficient for Latin America to close the growth gap.

That there is room for both types of reforms emerges from the regional level of decompositions presented in Table 3. Compared to East Asia, the annual growth gap in Latin America during the reform period amounted to around 4,5 percentage points (column 3). Of this, about 2.5 percentage points can be closed by doing more of the same— i.e., intensifying the reform effort along the lines already undertaken— in order to reach East Asian levels in these dimensions. In short, Latin America has indeed changed in terms of the reform variables we measured, but it still does not look like East Asia. Even if it did, however, the growth gap would be reduced but not eliminated. Structural and transitory differences between the regions accounted for about 2 percentage points of the regional growth gap in 1991-95. These transitory differences resulted from a positive growth residual in East Asia, and we suspect that they are probably indicative of continued reform in that region which is not captured by the variables available to us. This remaining gap suggests that the scope of reform in Latin America will need to be broadened. Improvements in macroeconomic management are simply not sufficient for Latin America to achieve long-run growth rates comparable to those achieved in East Asia. This conclusion emerges with even greater force in comparison to the OECD, where structural differences account for an even larger share of the current difference in growth performance relative to Latin America.

The final result of our study is, therefore, that while much has been painfully achieved in Latin America, and while the reforms that have been implemented have indeed delivered the boost in growth that they could have been expected to provide on the basis of international evidence, reaching much higher long-term growth rates in the region will require both an intensification of reform along the dimensions already implemented and a broadening of reform to incorporate changes in structural characteristics of Latin American economies that are still inhibiting growth in the region. Our results in this paper do not permit us to go further in identifying such characteristics, but we have been able to document their importance indirectly. A key item on the research docket for the region, therefore, should be to identify desirable directions in which to extend the reform agenda, as well as ways to make further progress in consolidating and intensifying the reform efforts that are currently underway.[26]

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[26] This could be done by identifying a set of additional regressors that are sufficient to eliminate the negative regional fixed-effect differential. The cross-country growth literature suggests some potential candidates. For example, the Inter-American Development Bank (1996) emphasizes the importance of macroeconomic volatility. Birdsall and Londoño (1996) stress the role of the distribution of assets. Others focus on income distribution, or on variables that measure the extent to which governments safeguard property rights. Preliminary results suggest that the volatility of terms of trade and the inequality of income distribution may be important in explaining Latin America's relatively low growth.

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APPENDIX

A. Data

The panel consists of the following 69 countries over the period 1961-1995:

LATIN AMERICA (18): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.

OECD (17): Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kindom, United States.

AFRICA (18): Algeria, Cameroon, Central African Republic, Ghana, Gambia, Kenya, Mauritius, Malawi, Rwanda, Senegal, Sudan, South Africa, Swaziland, Togo, Tunisia, Zaire, Zambia, Zimbabwe.

EAST ASIAN MIRACLES (5): Indonesia, Korea, Malaysia, Singapore, Thiland.

OTHERS (11): Bangladesh, Cyprus, Grecce, India, Israel, Jordan, Pakistan, Phillipines, Portugal, Sri Lanka, Turkey.

The period was divided into seven five-year subperiods: 1961-65, 1966-70, 1971-75, 1976-80, 1981-85, 1986-90, and 1991-95. Five-year simple averages of the available underlying yearly information were utilized. The resulting information panel was unbalanced due to data limitations for some countries. Out of a total of 482 possible observations, 37 were not available.

Except when noted, the data sources utilized are Inter-American Development Bank, World Bank, and International Monetary Fund official information. The basic data were the real growth rate of per capita GDP; real consumption as a proportion of real GDP; openness measured as real imports plus exports as a proportion of real GDP; inflation rate based on monthly CPI; financial deepening measured as the ratio of real M2 (deflated by year-end CPI), as a proportion of real GDP; real per capita GDP at the beginning of each period; average years of secondary schooling in the total population of 15+ years at the beginning of each period (Barro-Lee data set); terms of trade growth rate; black market premium (for 1961-1984 from Wood 1988, and for 1985-1995 from World Currency Yearbook 1996).

The following variables were entered with a logarithmic transformation: openness ratio, government consumption ratio, inflation (as 100+inflation rate in percent), financial depth ratio, initial GDP per capita, and black market premium (as 1+premium).

Data on the Structural Reform Index (Latin America, 1985-1995) are from Lora (1997). The volatility of inflation was measured as the standard deviation of annual inflation rates. The volatility of terms of trade was measured as the standard deviation of annual terms of trade growth rates. The inequality of income distribution is the income of the richest quintile divided by the income of the poorest two quintiles.

B. Statistical Methods - Basic Growth Equation

1. Basic Static Equation

The basic static estimation equation is:

$$g_{it} = s_i + w_t + ar_{it} + bc_{it} + u_{it} \tag{1}$$

where g, the explained variable, is the real per capita growth rate of GDP in country i (i ranging from 1 to 69) during period t (t ranging from 1 to 7). The first two terms are the structural country dummy and the time dummy, respectively. Macroeconomic reform variables are denoted by r and control variables are denoted by c.

In order to test the appropriateness of OLS estimation, instrumental variable estimation was conducted using the lagged values of inflation and financial depth as instruments (and the rest of the explanatory variables). Under the reasonable assumption that these instruments are exogenous, IV estimation is consistent. A Hausman specification test showed very strongly that the consistency of OLS cannot be rejected on the basis of this IV estimation. At the same time, the accuracy of IV estimations was clearly lower than that of OLS, which strongly suggests that the exogenous instruments are of poor quality in this case. All things considered, the best choice between the two methods is OLS.

Under the assumption that the country-specific effects are orthogonal to the regressors r and c, a random-effects model, in which the country-specific effects are controlled for within the regression error term, is consistent and more efficient

than the fixed-effects model posited above. A Hausman specification test shows that the consistency of the random-effects model, i.e., the validity of the orthogonality assumption, can be rejected with virtually total confidence. Therefore, the best choice between the two is fixed-effects OLS.

In the rest of the exercise, OLS was utilized on a fixed-effects model. Openness failed to be statistically significant at conventional confidence levels (p-value of 25 percent), while the other four macroeconomic reform variables had the right sign and were strongly statistically significant at least at the 97 percent confidence level. Discriminating the openness coefficient by region, openness entered with the right sign for all regions except Africa, where it was statistically significantly negative. We concluded that the failure of the openness variable in this panel was due to the African countries. One possible explanation is the effect of compensatory external financial aid to Africa, which may induce a negative correlation between growth performance and openness. We chose to eliminate openness from this basic static specification.

Estimations of the basic static equation after openness was eliminated are shown in column 1 of Appendix Table 1. All explanatory variables have the right sign, and are highly significant (p-value of less than 4 percent) except education (p-value of 40 percent). The Durbin-Watson statistic adjusted by the 68 cross-country residual differences of this panel (2.02) strongly supports the hypothesis of zero serial autocorrelation of residuals. Therefore OLS is efficient and the reported precision of the estimations is reliable. However, a Latin American dummy for the reform period 1991-95 is positive and statistically significant (p-value of 12 percent)

2. Basic Dynamic Equation
The basic dynamic equation adds the lagged values of the four macroeconomic reform variables (r'):

$$g_{it} = s_i + w_t + ar_{it} + a'r'_{it} + bc_{it} + u_{it} \qquad (2)$$

The consideration of a dynamic model in which the reform variables are also introduced with a lag indicated that the openness variable, both current and lagged, can be jointly rejected with a log-likelihood ratio test at the 15 percent level. Discriminating by region, the long-run effect of openness in Latin America was not significantly positive. We chose to eliminate the openness variable from this basic dynamic regression too.

The estimations after openness was eliminated are shown in column 2 of Appendix Table 1. The coefficients of the four lagged effects are negative but smaller than the estimated contemporaneous impact effect, which implies a partial dynamic offset. None of them is statistically significant at the 15 percent level individually. However, they are strongly jointly significant with virtually total confidence. This dynamic specification improves upon the static one. As measured by the adjusted R-square, the fit of this dynamic specification is better than that of its static counterpart. In this dynamic specification, education is statistically significant (p-value of 14 percent). The Latin America 1991-95 dummy is less significant (p-value of 20 percent). The hypothesis that the parameters of Latin America and the rest of the panel for the coefficients associated with the four reform variables, both contemporaneous and lagged, are equal cannot be rejected at conventional confidence levels (p-value of 27 percent)..

C. Statistical Methods - Introducing the Structural Policy Index

The Structural Policy Index is available for the Latin American countries in the panel on a yearly basis for 1985-1995. Let I_{it} denote the index for country i in subperiod t over the entire panel. When the underlying index is available, it results from computing the five-year averages for 1986-90 and 1991-95. When it is not available, it has to be estimated. Consider the regression equation:

$$g_{it} = s_i + w_t + ar_{it} + a'r'_{it} + bc_{it} + fI_{it} + u_{it} \qquad (3)$$

This specification is relevant to the extent that the coefficient f is positive and statistically significant. The growth contribution of the macroeconomic policy package in this specification is $ar_{it} + a'r'_{it} + fI_{it}$, based on which growth gap decompositions would be conducted. The following two statistical assumptions about how to estimate I_t when it is not available give rise to simple estimating equations.

3. Full Coordination (Assumption A)
Assuming that reforms are typically coordinated, the policy index could be estimated according to:

$$I_{it} = d_i + pr_{it} + v_{it} \qquad (4)$$

This estimating equation explains about 70 percent of the total variation of the index according to the adjusted R-square. The estimations of the four parameters associated with the reform variables are positive and statistically significant with at least 90 percent confidence. The macroeconomic reform variables are important in explaining the index. The change of the index over time can be well explained by these variables (about 50 percent of this time variation). The

interpretation is that the structural reforms reflected in the index are coordinated with the macroeconomic reform variables measured by r.

If the corresponding predictive equation $d_i + pr_{it}$ is taken as a good approximation of the value of the index when it is not available, then the introduction of the index I_{it} so constructed would make no difference for the overall fit because the index is spanned by variables already used. However, when it is available it may contribute. Let e_{it} be the relevant residual: v_{it} when the index is available and 0 otherwise. Consider the equivalent equation:

$$g_{it} = s_i + w_t + ar_{it} + a'r'_{it} + bc_{it} + fe_{it} + u_{it} \qquad (5)$$

The corresponding estimations are shown in column 1 of Appendix Table 2. The coefficient f has a positive sign and is statistically significant (p-value of 8 percent). The Latin American 1991-95 dummy is statistically insignificant at conventional levels (p-value of 35 percent). (A dynamic version including both the error and its lag was attempted but both coefficients were individually insignificant in the statistical sense.)

The growth contribution of the macroeconomic policy package is now what is directly obtained from the reform variables, i.e., $ar_{it} + a'r'_{it} + fe_{it}$, plus the unknown contribution absorbed by the country dummies, i.e., fd_i. This last term is constant, and therefore irrelevant for assessing the contribution of a macroeconomic policy reform package in a given country (as in Tables 1 and 2 in the main text). However, it would be relevant for the decomposition of cross-region growth gaps (as in Table 3 in the text) unless aggregate d_i are equal in both regions. Fortunately, the evidence shows that such an assumption is realistic. For example, the estimated Latin American dummies d_i are uncorrelated with the out-of-sample, pre-reform index in 1985. This finding suggests that systematic differences in the unobservable index across countries are fully absorbed by differences in the four measured macroeconomic reform variables and, therefore, the expected value of d_i is constant across countries.

4. No Coordination (Assumption B)

Alternatively, assuming that reforms are not coordinated, the policy index could be estimated according to:

$$I_{it} = d_i + v_{it} \qquad (6)$$

This estimating equation explains about 50 percent of the total variation of the index according to the adjusted R-square. If the corresponding predictive equation d_i is taken as a good approximation of the value of the index when it is not available, then, again, the introduction of the index I_{it} so constructed would make no difference for the overall fit, but it may contribute when it is available. Again, let e_{it} be the relevant residual: v_{it} when the index is available and 0 otherwise. Now the important difference is that under this predictive function, it makes sense to assume that Latin America's vector of dummies d_i is the out-of-sample, pre-reform 1985 index. Therefore, $v_{it} = I_{it} - I_{i,85}$.

The corresponding estimations are shown in column 2 of Appendix Table 2. The coefficient f has again a positive sign and is statistically significant (p-value of 4 percent). The Latin American 1991-95 dummy turns negative but it is strongly statistically insignificant (p-value of 85 percent). (A dynamic version including both the error and its lag reproduced the partial dynamic offset found for the other macroeconomic reform variables. For comparability, the statistically insignificant lagged variable was dropped.)

Again, the growth contribution of the macroeconomic policy reform package within a given set of countries (as in Table 1 in the main text) can be easily obtained by simply considering the reform variables, i.e., $ar_{it} + a'r'_{it} + fe_{it}$, since the contribution absorbed by the country dummies drops out. However, assumptions regarding this last term in non-Latin American countries would be needed to decompose cross-region growth gaps under this scenario.

D. Statistical Methods - Explaining Growth Country Dummies

Based on the structural growth country dummies s_i obtained from estimating equation (3) under the full coordination assumption, the following secondary cross-country regression was considered:

$$s_i = a + b(volinf)_i + c(voltot)_i + d(ineq)_i + u_i \qquad (7)$$

where volatility and inequality are measured over the entire period 1961-1995.

This specification explains 35 percent of the variation of the country dummies according to the adjusted R-square. The effect of the volatility of inflation is not significantly different from zero at any reasonable confidence level. However, the volatility of terms of trade growth and income inequality negatively affect growth in a statistically significant manner.

E. Statistical Methods - Regional Aggregation

Let G/P_i denote per-capita GDP in country i. Its growth rate can be expressed as g_i-p_i, the difference between the GDP growth rate and the population growth rate. Let G/P denote per-capita GDP in the region as a whole, where G and P are obtained by adding across countries.

How does the aggregate per capita growth rate, g-p, relate to the countries' per-capita growth rates g_i-p_i? Let AVG_G denote a GDP-weighted average (weights $\alpha_i = G_i/G$) and AVG_P a population-weighted average (weights $B_i = P_i/P$) of the underlying per-capita growth rates g_i-p_i. It is clear that $g = AVG_G(g_i)$ and $p = AVG_P(p_i)$. Then, the per-capita aggregate growth rate is:

$$g\text{-}p = AVG_G(g_i) - AVG_P(p_i).$$

How does this ideal measure compare with the two alternative methods GDP-weighted, $AVG_G(g_i\text{-}p_i)$, and population-weighted, $AVG_P(g_i\text{-}p_i)$? They are both inaccurate. The GDP-weighted average bias is $AVG_G(p_i) - AVG_P(p_i) = Cov(p, (\alpha\text{-}B))$. The population-weighted bias is $AVG_P(g_i) - AVG_G(g_i) = -Cov(g, (\alpha\text{-}B))$.

However, the important question for our purpose is not the level of aggregate per capita growth but its change due to reform. Let g'_i and g' be the new GDP growth rates. Under the maintained assumption that population growth is exogenous, i.e., is not affected by reform, the question is now how to find

$$(g'\text{-}p) - (g\text{-}p) = g'\text{-}g = AVG_G(g'_i) - AVG_G(g_i).$$

How does this ideal measure compare with the two alternative methods $AVG_G(g'_i\text{-}p_i) - AVG_G(g_i\text{-}p_i)$ and $AVG_P(g'_i\text{-}p_i) - AVG_P(g_i\text{-}p_i)$? The answer is simple because the p_i's cancel out in these calculations. GDP-aggregation exactly measures the reform contribution while population-aggregation is inaccurate, the bias being $-Cov(g'\text{-}g', (\alpha\text{-}B))$.

In practice, the observations available containing variations in GDP growth rates g also contain variations in population growth rates p, so that the formula above cannot be applied. In an intertemporal comparison for a given region in a short period of time, e.g., 1991-95 relative to 1986-90, the error resulting from GDP aggregation is probably extremely small because population growth rates are very persistent. But far more important, this discrepancy is unaffected by reform and should be attributed to demographic factors, so that GDP-aggregation still delivers an unbiased measure of reform contribution to growth. More generally, GDP-weighting yields the right contributions of explanatory variables also in the decomposition of growth levels, as opposed to growth gaps, because the above-mentioned bias, $Cov(p, (\alpha\text{-}B))$, is a demographic factor unrelated to them. This implies that GDP-weighting also provides the right contributions of reform and other explanatory variables in explaining per-capita growth gap decompositions across regions.

Appendix Table 1: Explaining annual per capita GDP growth (percent)

Explanatory Variables	Excluding Structural Policy Index			
	(1): Static		(2): Dynamic (Lags underneath)	
Stabilization and Structural Reform				
Lower Public Consumption	2.9	(0.6)	3.5	(0.8)
			-1.2	(0.8)
Lower Inflation	1.5	(0.5)	1.6	(0.6)
			-0.3	(0.6)
Financial Deepening	1.0	(0.5)	1.5	(0.6)
			-0.2	(0.7)
Exchange Rate Unification	2.2	(0.5)	2.3	(0.5)
			-0.3	(0.6)
Control Variables				
Initial GDP	-2.4	(0.5)	-3.0	(0.7)
Education	0.23	(0.27)	0.57	(0.39)
Terms of Trade	5.5	(2.3)	6.4	(2.5)
Worldwide Cycle				
1966-70	0		0	
1971-75	0.66		0.49	
1976-80	0.68		0.18	
1981-85	-0.92		-1.54	
1986-90	0.14		-0.59	
1991-95	-0.82		-1.58	
Adjusted R^2	0.56		0.60	
DW Statistic	2.05		1.99	
Latin America 1991-95				
Average Residual	0.53		0.39	
Dummy	0.94	(0.59)	0.79	(0.61)

Note: Standard error estimates in parentheses.

Appendix Table 2: Explaining annual per capita GDP growth (percent)

Explanatory Variables	Including Structural Policy Index			
	(3): Assumption A (Lags underneath)		(4): Assumption B (Lags underneath)	
Stabilization and Structural Reform				
Lower Public Consumption	3.4	(0.8)	3.2	(0.8)
	-1.1	(0.8)	-1.0	(0.8)
Lower Inflation	1.5	(0.6)	1.5	(0.6)
	-0.2	(0.6)	0.1	(0.7)
Financial Deepening	1.5	(0.6)	1.4	(0.6)
	-0.2	(0.7)	-0.1	(0.7)
Exchange Rate Unification	2.3	(0.5)	2.2	(0.5)
	-0.4	(0.6)	-0.4	(0.6)
Structural Policy Index (Residual)	15.8	(9.0)	--------------	
Structural Policy Index (Change)	--------------		5.9	(2.9)
Control Variables				
Initial GDP	-3.0	(0.7)	-2.8	(0.7)
Education	0.56	(0.39)	0.59	(0.39)
Terms of Trade	6.2	(2.5)	6.4	(2.5)
Worldwide Cycle				
1966-70	0		0	
1971-75	0.49		0.45	
1976-80	0.19		0.13	
1981-85	-1.52		-1.60	
1986-90	-0.53		-0.73	
1991-95	-1.62		-1.90	
Adjusted R^2	0.60		0.60	
DW Statistic	1.99		1.98	
Latin America 1991-95				
Average Residual	0.28		-0.06	
Dummy	0.59	(0.62)	-0.17	(0.86)

Note: Standard error estimates in parentheses.