Comments

Daniel Lederman: The editors of *Economía* are to be commended for recruiting the perfect pair of authors to write a paper on economic development in East Asia and Latin America.[1] Both authors are well-known research economists who know much more than I about economic growth and the costs of financial crises. The fact that De Gregorio is a long-time policymaker and observer of Latin American economic issues and Lee is a well-known Korean economist is the cherry on the sundae.

De Gregorio and Lee provide substantial food for thought that merits further analysis. I will not take space here to discuss the costs of a balance-of-payments crisis, although that section of the paper is quite interesting and informative. Their calculations of the high costs of the Asian crises in the 1990s compared with those suffered by Latin American economies in the same period, plus their estimates of the determinants of these costs, seem to be consistent with existing case-study evidence my coauthor and I put together in 1998.[2] However, some of the econometric issues raised below are applicable to the econometrics of the costs of crises.

It is difficult to argue against the basic findings of their econometric analyses, as is often the case with empirical studies of the determinants of economic growth across countries and over time. The authors find that education, trade, institutions, and so forth are good for growth. They offer no surprises, and this is perhaps the main weakness of the paper. It does not really advance our knowledge of the fundamental factors that drive growth. Its main contribution is the comparison between East Asia and Latin America, but the reader is left with a sense that everything matters for growth and that East Asia has performed better than Latin America because it has done many things—if not everything—better.

1. Ana María Menéndez provided superb research assistance for my comments.
2. See Perry and Lederman (1999).

This is simply not the case. Many of the results on the determinants of economic growth are not as robust as the authors argue. My comments aim to provide insights about econometric pitfalls that might affect not only the cross-country growth regressions, but numerous other applications, as well.

Econometric Pitfalls

The empirical model estimated by the authors and by literally hundreds of other researchers working on the determinants of economic growth can be written as follows:

$$y_{i,t} = c + \beta y_{i,t-1} + \eta_i + \upsilon_t + \varepsilon_{i,t}, \quad (1)$$

where y is the natural logarithm of per capita GDP. Most researchers, including De Gregorio and Lee, subtract y in the previous period $(t - 1)$ from the left-hand side of equation 1. This is trivial, however, for the only difference is that the beta on the lagged value of y on the right-hand side minus one equals the coefficient on the initial level of per capita income that was estimated by De Gregorio and Lee in their growth regressions. That is, the economic growth models are models of the determinants of per capita income, and the explanatory variables are admittedly country characteristics that supposedly determine the steady-state level of development for each country. The conditional convergence coefficient is thus nothing more than an estimate of the persistence of GDP per capita over time across countries.

In equation 1, η_i captures any country-specific characteristic that does not change over time. In the growth literature, Barro and Sala-i-Martin argue that for international comparisons, it is important to capture this cross-country heterogeneity in the steady-state level of development, because it is unlikely that all countries use the same technology and have the same economic preferences.[3] Ignoring the influence of these fixed effects probably biases the estimates of β in equation 1 or of any other additional regressor.

3. Barro and Sala-i-Martin (2003).

De Gregorio and Lee deal with this heterogeneity, as many have done in the past, by also estimating model 1 or its equivalent in differences, which eliminates the influence of the unobserved heterogeneity:

(2) $$y_{i,t} - y_{i,t-1} = \beta(y_{i,t-1} - y_{i,t-2}) + \upsilon_t + (\varepsilon_{i,t} - \varepsilon_{i,t-1}).$$

The problem with this model is that the lagged change in per capita GDP, $y_{i,t-1} - y_{i,t-2}$, is by construction correlated with the differenced error term, $\varepsilon_{i,t} - \varepsilon_{i,t-1}$. Estimates of β are clearly biased downward, since the differenced error is negatively correlated with the lagged difference of y. This is not a minor or irrelevant parameter: it might actually be the most important parameter in the empirical growth literature, since it provides a measure of convergence, or a test of the hypotheses that poor countries naturally tend to grow faster than rich ones as a result of diminishing returns to scale or the relative ease with which poor countries can adopt existing technologies invented by the rich economies. Moreover, since most of the right-hand-side variables used by De Gregorio and Lee and many others as fundamental sources of economic growth are also correlated with GDP per capita, it is possible that all coefficient estimates contain biases of unknown form.

A potential solution for this source of biased estimates is to find an instrumental variable, z, such that $E(z, \varepsilon_{i,t} - \varepsilon_{i,t-1}) = 0$ and $E(z, y_{i,t-1} - y_{i,t-2}) \neq 0$. De Gregorio and Lee seem to have taken this route. Their econometric results presented in table 2, column 5, correspond to the differenced equation similar to equation 2 above, and they use instrumental variables. However, it is not clear from the description of their instruments in the note to the table whether they are using further lags of y as an instrumental variable for the change in this variable. If so, then this approach is very similar to Arellano and Bond's generalized method of moments (GMM) differences estimator, which uses further lagged values of y as instrumental variables for $y_{i,t-1} - y_{i,t-2}$.[4]

In any case, linear estimates of the persistence or convergence coefficient in equation 1 for pooled cross-country data are biased upwards. In the case of the growth regressions, the conditional convergence coefficient will be biased downward in absolute value. Given that the fixed-effects estimators of the persistence coefficient in equation 1 are biased downwards, the true

4. Arellano and Bond (1991).

persistence coefficient falls somewhere between the linear, pooled, and the fixed-effects estimates. These theoretical predictions are borne out in the estimates provided by De Gregorio and Lee in table 2, in that their 3SLS estimates of the coefficient on the initial level of log GDP per capita fall between their first-differences and cross-section estimators.[5] More generally, the authors do not discuss or analyze the validity of their instrumental variables, which makes it difficult to judge the reliability of their estimates.

A Demonstration of Econometric Pitfalls: Unobserved Heterogeneity and Causality

De Gregorio and Lee use the regression results presented in column 2 of table 2 to calculate the contributions of the various explanatory variables to the differences in the performance of the average East Asian and Latin American countries. It is not at all clear, however, that those are the most reliable estimates. Suppose, for example, that the best estimates are those listed under column 5, which were derived from the model in differences using instrumental variables to deal with the endogeneity biases. Based on these results, investment, schooling, government consumption, rule of law, democracy, and balance-of-payments crises are not significant explanations of differences in country growth rates.

Each one of the explanatory variables chosen by the authors could be questioned on the grounds of endogeneity, stemming from either reverse causality running from development to the explanatory variables, or from unobserved country-specific characteristics (fixed effects). With regard to education, for example, the authors assume that the initial levels of male schooling are exogenous to the subsequent growth rate (see the note to table 2). This might not be the case. First, schooling changes very slowly over the course of a five-year period, as measured by the authors, and it is thus not clear that using the initial level of schooling is any different from

5. The absolute value of their point estimate of the convergence coefficient derived from the differences estimator (–0.063) seems incredibly high. It implies that the annual speed of convergence is about 6.1 percent a year, whereas most of the literature provides estimates around 2 percent. I wonder if this estimate is still biased, in which case De Gregorio and Lee should have used further lags of GDP per capita levels (not differences) as instrumental variables for the lagged differenced GDP per capita.

using the years of schooling at the end of each five-year period. Second, the expectation of economic growth itself might lead economic agents to invest in education.[6] This same argument can be applied to the capital investment decisions, whereby current investment is determined by expectations of future economic growth.[7]

The concept of absolute convergence provides another reason to look more deeply into the behavior of the explanatory variables, including education. De Gregorio and Lee find evidence, albeit not consistently estimated, in favor of the conditional convergence hypothesis, which postulates that poor countries would grow faster than rich countries if they had the same levels of the conditioning variables, including education. If education and the other explanatory variables do not converge across countries, then there is little hope that poor countries will ever catch up with the rich countries in an absolute sense. This was the argument put forth by Pritchett.[8] If so, then the estimates of the conditional convergence coefficient have little importance, for the secret to development might be to make improvements in education and the other control variables, without which poor countries will never grow fast enough to reach the levels of development of the industrialized countries in the very long run.

To provide alternative estimates of the speed of convergence, I estimated various econometric models for equation 1 above. Table 9 contains the results for the log of GDP per capita (log y) and table 10 for the log of years of education (log ED) for the adult population, not just males. Finally, I estimated various models of the causal relation between education and per capita GDP. The first column in each table shows the pooled OLS estimates of the autoregressive coefficient for the variable, based on observations separated by five-year periods so as to make them comparable with the frequency used by De Gregorio and Lee. The second column presents the corresponding fixed-effects estimates. The third column reports the estimates from the GMM system estimator suggested by Blundell and Bond, which estimates equations 1 and 2 simultaneously.[9] In this approach, the lagged dependent variable on the right-hand side in the levels equation (that is, equation 1) is instrumented by its lagged differences, whereas the differenced

6. Bils and Klenow (2000).
7. Blomström, Lipsey, and Zejan (1996).
8. Pritchett (1997).
9. Blundell and Bond (1998).

TABLE 9. Various Estimates of the Autoregressive Coefficient for GDP per Capita, Based on Cross-Country Panel Data

Explanatory variable	*Pooled OLS (1)*	*Fixed effects (2)*	*GMM system (3)*	*GMM differences (4)*
Log $y(t-1)$	1.02	0.86	1.05	0.92
Summary statistic				
Overidentification test (p value)	. . .	. . .	0.21	0.61
Second-order serial correlation (p value)	. . .	. . .	0.72	0.73
No. observations	703	703	703	611
No. countries	92	92	92	92

Source: Author's calculations, based on data from the Penn World Table 6.1, chain GDP ppp-adjusted series (see Heston, Summers, and Aten, 2002).

a. The dependent variable is the log of GDP per capita (y). Column 1 shows the pooled OLS estimates of the autoregressive coefficient for each variable, based on observations separated by five-year periods; column 2 presents the corresponding fixed-effects estimates; column 3 reports the estimates from the Blundell-Bond GMM system estimator; and column 4 presents the results derived from the Arellano-Bond differences estimator. All regressions include period dummies. The variables are measured every five years over the period 1960–2000.

equation 2 uses lagged levels as instruments. Finally, the fourth column presents the results derived from the Arellano-Bond differences estimator, which entails estimating the differenced equation 2 and using further lagged levels of each dependent as instruments of their lagged changes.

As predicted by econometric theory, the GMM estimates fall between the pooled and fixed-effects estimates for both variables, except in the case of the GMM system estimation of the persistence of log y. Since the

TABLE 10. Various Estimates of the Autoregressive Coefficient for Years of Education, Based on Cross-Country Panel Data

Explanatory variable	*Pooled OLS (1)*	*Fixed effects (2)*	*GMM system (3)*	*GMM differences (4)*
Log ED$(t-1)$	0.92	0.80	0.90	0.90
Summary statistic				
Overidentification test (p value)	. . .	. . .	0.16	0.13
Second-order serial correlation (p value)	. . .	. . .	0.58	0.58
No. observations	703	703	703	611
No. countries	92	92	92	92

Source: Author's calculations, based on data from Barro and Lee (2000).

a. The dependent variable is the log of the average years of education of the population over twenty-five years of age (ED). Column 1 shows the pooled OLS estimates of the autoregressive coefficient for each variable, based on observations separated by five-year periods; column 2 presents the corresponding fixed-effects estimates; column 3 reports the estimates from the Blundell-Bond GMM system estimator; and column 4 presents the results derived from the Arellano-Bond differences estimator. All regressions include period dummies. The variables are measured every five years over the period 1960–2000.

system GMM estimator partially relies on the cross-section variation, it is natural that its estimates of the autoregressive coefficient are closer to the pooled OLS estimates than to the fixed-effects estimates. In contrast, the GMM differences estimator does not include the equation in levels, and its estimates are thus closer to the fixed-effects estimates after controlling for the endogeneity biases.

Tables 9 and 10 also present the appropriate overidentification tests for both the GMM system and GMM differences estimators. The null hypothesis of these tests is that the correlation between the instrumental variables and the regression errors are zero. A *p* value greater than 0.05 indicates that the instrumental variables are valid. The tables further provide estimates of the serial correlation in the errors. Since the GMM estimates include the equation in differences, first-order serial correlation is expected, but second-order serial correlation would be interpreted as evidence that the model is not well specified.

The first finding of interest for the paper by De Gregorio and Lee is that per capita GDP and years of schooling are both quite persistent over time. Estimates of the autoregressive coefficient close to one suggest that cross-country convergence does not occur. The GMM results imply no absolute convergence across countries. For per capita GDP, the pooled and system GMM estimates are one, whereas the GMM differences and the fixed effects are substantially lower than one. For education, the pooled and GMM system estimates are a bit lower than those for GDP per capita. As expected, the fixed-effects estimator provides the lowest estimates of the autoregressive coefficient of the educational variable. From the viewpoint of development, these results are reassuring, for the pace of convergence of education is faster than that of per capita GDP. This means that significant absolute convergence has occurred across countries in levels of education. Education is not the only determinant of the level of per capita GDP, however, so the correspondence between catching up in education and catching up in level of income is not necessarily proportional.

The possibility that development itself might lead to investments in education is still an issue, so I investigated the direction of causality between education and levels of development. Table 11 provides estimates for Granger-causality tests between these two variables (see columns 1 and 2). Since Granger causality is not sufficient if schooling rises in anticipation of growth, the table includes additional estimates in which schooling is determined by both past and future values of per capita GDP (column 3). This

TABLE 11. Granger-Causality Tests[a]

	Per capita GDP	Years of education	
Explanatory variable	*(1)*	*(2)*	*(3)*
Log $y(t-1)$	1.02	n.s.	–0.25
Log ED$(t-1)$	0.03	0.92	0.93
Log $y(t+1)$			0.20
No. observations	703	703	611
No. countries	92	92	92

Source: Author's calculations, based on data from the Penn World Table 6.1, chain GDP ppp-adjusted series (see Heston, Summers, and Aten, 2002) and Barro and Lee (2000).

n.s. Not statistically significant at the 10 percent level.

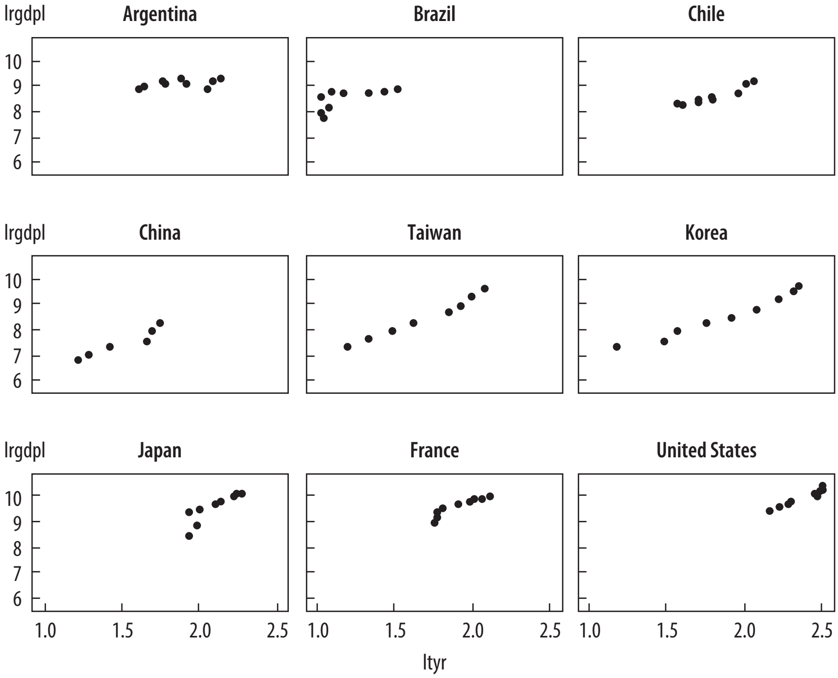
a. The dependent variable in column 1 is the log of GDP per capita (y); in columns 2 and 3, it is the average years of education of the population over twenty-five years of age (ED). The estimation method is based on the Blundell-Bond GMM system estimator. All regressions include period dummies. The variables are measured every five years over the period 1960–2000.

model employs the same set of instruments as in the previous regressions, such that future per capita GDP is being instrumented by past values of per capita GDP and education. The assumption underlying this exercise is that expectations about future growth are formed based on past values of education and GDP. The specification tests suggest that these models are well specified. The results also suggest that education Granger-causes development, but development does not cause schooling. These are encouraging results for De Gregorio and Lee, for they suggest that it might be safe to assume that education in previous years or at the beginning of a five-year period is a good predictor of per capita GDP in subsequent years. However, the final set of results in column 3 implies that education is actually determined by expectations of future growth, whereas past GDP actually has a negative effect on education. Perhaps the education results discussed by De Gregorio and Lee suffer from forward-looking endogeneity biases.

Development beyond Averages

Absolute convergence in education could thus be a source of convergence in incomes across countries. This might not be the case in practice, however, even when on average it appears to be supported by econometric estimates. To illustrate this point, figure 7 shows scatter plots of (log) years of education plotted along the horizontal axes and (log) GDP per capita plotted vertically. It shows the growth trajectories for three large Latin American

FIGURE 7. Education and Growth Trajectories



Source: Author's calculations, based on data from Heston, Summers, and Aten (2002) and Barro and Lee (2000).

economies, three Asian economies, and three high-income countries. The high-income countries are bunched in the upper-right corner of their graphs. Taiwan and Korea seem to have grown fast with contemporaneous improvements in educational attainment. China, in contrast, displays fast growth only in the last ten years, with only modest improvement in education. The Latin American economies, in turn, have greatly improved the education level of their labor force, but economic growth (represented by vertical movements in these graphs) has remained elusive despite these educational achievements. This suggests the presence of idiosyncratic development trajectories, which show up as average effects although not all countries follow the same path to development.

Arguing, as De Gregorio and Lee do, that faster educational improvements in East Asia vis-à-vis Latin America might partly explain (about

9 percent) the differences in economic growth between these two regions might be a bit misleading. The authors provide additional estimates of the returns to years of schooling in both regions and find weak evidence that the returns are higher in East Asia, perhaps as a result of differences in the quality of education. I wonder, though, if the returns to schooling vary across different groups of countries when different econometric estimators are used. Those of us who, like De Gregorio and Lee, care deeply about how to bring about economic progress in poor countries need to know a lot more about each of the explanatory variables examined by these authors.

Nouriel Roubini: This insightful paper studies two main issues: first, the determinants of long-run growth in Latin America and the Caribbean and East Asia and the reasons for the growth differential between these two regions; and second, the effects of balance-of-payments crises on growth and the extent of output contractions in these crises.

The paper presents striking facts about the relative growth performance of East Asia and Latin America. Latin America and the Caribbean have grown much more slowly than East Asia for the last forty years. Most of the East Asian economies had very low per capita GDP after World War II; for example, Korea's GDP was then closer to some African countries and much lower than that of Argentina, Venezuela, and many other Latin American countries. Based on initial per capita GDP, East Asia should have grown faster than Latin America for a while (the convergence trend), but the actual growth performance of East Asia has been much stronger than what one would predict using initial per capita GDP only—and it has continued even after the relative per capita GDP condition reversed in favor of Latin America.

Consequently, the authors estimate the role of other factors that can explain this growth differential. Their list of factors includes all the usual suspects: the investment rate; fertility; human resources (schooling and life expectancy); institutions and policy; government consumption; rule of law; inflation rate; democracy; openness; terms of trade; and balance-of-payments crises. These factors all represent sensible explanations of the differential growth performance of the two regions. In the end, however, one is left a little unsatisfied for the following reason: most of these variables are endogenous themselves. Investment rates depend on good macroeconomics and sound structural policies and institutions; inflation depends on fiscal imbalances, which, in turn, reflect other core political economy issues; openness depends on the trade policy regime (in Latin America and the Caribbean, for example, import substitution policies led to a low degree of openness), but these are themselves caused by deeper political economy factors; and balance-of-payments crises and other financial crises depend on macroeconomic and structural weaknesses. In other words, one needs to explain the core political economy reasons why Latin America and the Caribbean for so long pursued loose fiscal policies that led to debt accumulation, high inflation, monetary instability, and eventually debt crises and defaults; why savings and investment rates have been low; and why the region implemented excessive government regulation of the economy and inward-oriented trade policies.

The authors start out in the right direction by considering the role of income and wealth inequality in Latin America and the Caribbean. Sachs and Williamson offer an original view of why Latin America has done so poorly relative to East Asia, in which they center on the role of income and wealth inequality.[1] De Gregorio and Lee find an indirect effect of income inequality, as such inequality leads to higher fertility, higher government consumption, lower human capital (lower secondary school enrollment), and lower institutional quality (lower rule of law).

The paper is relatively optimistic that some greater growth convergence between the two regions will finally occur in this decade. The current evidence through 2004 is not consistent with this view, however: the International Monetary Fund (IMF) compares growth in Developing Asia and the Western Hemisphere (which approximately cover East Asia and Latin America) and finds that Developing Asia grew 7.7 percent in 1986–95 and an estimated 6.6 percent in 1996–2005, whereas the Western Hemisphere grew 2.8 percent and 2.5 percent, respectively, in the same periods.[2] Moreover, the growth performance of Latin America and the Caribbean in 2001–03 was dismal, with modest recovery in 2004—and the crises in Latin America in the last few years are only part of the explanation, since East Asia suffered a severe crisis in the late 1990s. Latin America is also showing signs of reform fatigue, together with something of a backlash against the Washington Consensus and globalization.

The authors find that crises have only a temporary effect on growth rates. The loss of output is permanent, but the growth effect is transitory as growth recovers its long-run trend value after a crisis (that is, after the five-year period

1. Sachs and Williamson (1985).
2. IMF (2004).

of the shock). These crises are estimated to have contributed to a difference in growth performance between Latin America and East Asia of 0.25 percent a year over the 1970–2000 period. The authors present a forecast of a relative growth convergence between Latin America and East Asia in the 2000–10 period, based on the assumption that neither region will experience a crisis in that period. At the same time, the authors show that the occurrence of a crisis would lower the convergence rate between the two regions by 1.7 percent a year. Further crises may thus hamper the growth convergence.

The paper also presents some stylized facts about financial crises and growth. A main result is that of a V-shaped recovery after a crisis. I am somewhat skeptical that this V-shaped recovery applies to Latin America and the Caribbean in general, for various reasons. Specifically, the authors' definition of a crisis includes only currency crises (that is, sharp depreciation or currency pressures). Emerging market economies, however, are susceptible to banking crises, corporate crises, and sovereign debt crises, in addition to currency crises. The growth and output effects of a currency crisis are much more severe if the initial crisis is associated with other crises. Another problem is that the paper lumps together severe crises—such as Mexico in 1994, Ecuador in 1998, and Argentina in 2001—with episodes of exchange rate pressures—such as Colombia in 1998—that did not lead to a broader financial crisis involving sovereign debt problems or banking problems. Output contractions tend to be most severe in the face of a broad financial crisis that combines a currency crisis, a banking crisis, and difficulties servicing sovereign debt. Examples of broad financial crises include Mexico, Ecuador, and Argentina, as mentioned above. Examples of a pure currency crisis are Brazil in 1999 and Colombia in 1998. Latin America and the Caribbean have experienced many currency-cum-financial crises since 2000: Ecuador in 1999–2000; Argentina in 2001; Brazil and Uruguay in 2002; the Dominican Republic and Venezuela in 2003; and Dominica in 2004. Several countries are potentially vulnerable in the future, including Brazil, Colombia, Ecuador, Haiti, Jamaica, Panama, Venezuela, and many highly indebted small Caribbean countries.

Regarding a V-shaped recovery, the experience of Latin America and the Caribbean was very different in the 1980s than in the 1990s and recent years. The paper does not sufficiently stress the fact that the crises of the 1980s were not characterized by a V-shaped recovery. This was, for a large part of the region, a lost decade in terms of growth. Per capita growth for Latin America and the Caribbean in the 1980s was –0.8 percent a year.

Growth did not bounce back after 1982; the region was only able to achieve a sustained recovery toward the end of the decade, following macroeconomic and structural reforms and a debt reduction plan (the Brady plan).

The crises of the 1990s and later present more evidence of a V-shaped recovery (for example, Mexico in 1994 and Brazil in 1999). Argentina bounced back in 2003 after the sharp collapse of 2002, but the country had been in a recession since 1999 (well before the crisis of end 2001) and the cumulative output fall was about 24 percent. It is thus hard to talk about a V-shaped recovery in Argentina. The same argument holds for Uruguay. One reason why recovery was more V-shaped in the 1990s than in the 1980s is that some of the macroeconomic and structural reforms that led to the lost decade of growth in the 1980s (such as taming inflation and liberalizing the economy) were not present in the 1990s. Also, some of the crises of the 1990s involved liquidity rather than insolvency (as was the case in Mexico in 1994 and Brazil in 1999), whereas the crises of the 1980s tended to stem from insolvency. Indeed, the most severe crises in recent years in Latin America were those in which solvency was at stake (for example, Argentina, Ecuador, and Uruguay). Debt ratios (relative to GDP, exports, or government revenues) continue to be very high throughout Latin America, and some analysts hold that these countries are debt intolerant.[3] One therefore cannot exclude the possibility that there will be another series of sovereign debt crises in the future, which would have severe output and growth effects (at least in the short run).

Finally, the paper presents an interesting empirical analysis of the determinants of the output costs of crises. The authors define output costs as occurring over three years of a crisis, but this may not be precise for Latin America and the Caribbean in the 1980s, when growth declines were more persistent. Thus the figures presented in the paper—namely, that the average output loss in 1970–99 was higher in East Asia than Latin America (10.4 percent versus 8.9 percent)—sound suspicious. Moreover, Latin America and the Caribbean have experienced many more crises than East Asia, given the definition of crises based on currency movements. The Latin American crises are thus a mix of severe and relatively moderate crises, while those in Asia are mostly severe, as in the case of the 1997–98 crises. These definitions may account for the paradoxical results in the paper.

3. See, for example, Rogoff, Reinhart, and Savastano (2003).

The authors find that the precrisis factors that matter for output costs are GDP growth (a proxy for a credit boom); international liquidity (reserves/M2); and banking sector soundness (a measure that has causality issues given the paper's definition of a banking crisis as before or after a currency crisis). The postcrisis factors that matter are world GDP growth; the degree of real exchange rate depreciation; and macroeconomic policies (the growth rate of the real money supply and fiscal balance). The paper implicitly argues that real depreciation is good in that it improves competitiveness, but the effect of the real exchange rate on output is ambiguous because large levels of foreign currency liabilities cause balance sheet effects. My own work finds that in the crises of the 1990s, output contraction was larger, the larger was the amount of such foreign currency liabilities times the total real depreciation.[4] Large foreign currency liabilities also corresponded with exchange rate overshooting, relative to fundamentals. I was therefore surprised by the paper's results on the real exchange rate, which indicate that a 70 percent real depreciation decreases the output cost by 2.4 percent. I believe the results are due to two factors. First, the sample combines countries with little foreign currency debt (Europe) and countries that have heavily dollarized liability (Latin America and the Caribbean). The effect of real exchange rate depreciation on output differs in these two groups. Second, the timing of the devaluation is critical. A sharp depreciation initially reduces output given the balance sheet effects, but output tends to recover over time, as the competitiveness effect kicks in.

The macroeconomic policy variables similarly raise causality issues: what causes what? Does lower growth lead to lower money growth? The instrumental variables (IV) estimation shows an insignificant effect of money growth when the authors control for endogeneity. Consequently, the authors' argument that easy money facilitates recovery is not warranted here. Macroeconomic policies play an important signaling role when credibility is at stake in a crisis, and tight money may be necessary for managing the crisis. The paper does not address this issue, although the authors mention it.

Overall, this is a useful and important contribution with many important insights. Still, the mystery of why Latin America and the Caribbean has performed so poorly relative to East Asia remains open.

4. Cavallo and others (2003).

References

Alesina, Alberto F., and Dani Rodrik. 1994. "Distributive Politics and Economic Growth." *Quarterly Journal of Economics* 109(2): 465–90.

Arellano, Manuel, and Stephen R. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58(2): 277–97.

Barro, Robert J. 1991. "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics* 106(2): 407–43.

———. 1997. *Determinants of Economic Growth: A Cross-Country Empirical Study*. MIT Press.

———. 1999. "Human Capital and Growth in Cross-Country Regressions." *Swedish Economic Policy Review* 6(2): 237–77.

———. 2001. "Economic Growth in East Asia before and after the Financial Crises." Working paper 8330. Cambridge, Mass.: National Bureau of Economic Research.

Barro, Robert J., and Jong-Wha Lee. 1994. "Sources of Economic Growth." *Carnegie-Rochester Series on Public Policy* 40:1–57.

———. 2001. "International Data on Educational Attainment: Updates and Implications." *Oxford Economic Papers* 53(3): 541–63.

Barro, Robert J., and Xavier Sala-i-Martin. 2003. *Economic Growth,* 2d ed. MIT Press.

Bils, Mark, and Peter J. Klenow. 2000. "Does Schooling Cause Growth?" *American Economic Review* 90(5): 1160–1183.

Blomström, Magnus, Robert E. Lipsey, and Mario Zejan. 1996. "Is Fixed Investment the Key to Economic Growth?" *Quarterly Journal of Economics* 111(1): 269–76.

Blundell, Richard, and Stephen Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87(1): 115–143.

Borensztein, Eduardo, and José De Gregorio. 1999. "Inflation and Devaluation after Currency Crises." Washington: International Monetary Fund.

Borensztein, Eduardo, and Jong-Wha Lee. 2002. "Financial Crisis and Credit Crunch in Korea: Evidence from Firm-Level Data." *Journal of Monetary Economics* 49(4): 853–75.

Bosworth, Barry P., and Susan M. Collins. 2003. "The Empirics of Growth: An Update." Working paper. Brookings Institution.

Burnside, Craig, Martin S. Eichenbaum, and Sergio Rebelo. 2001. "Prospective Deficits and the Asian Currency Crisis." *Journal of Political Economy* 109(6): 1155–97.

Caprio, Gerard, and Daniela Klingebiel. 1996. "Bank Insolvencies: Cross-Country Experience." Policy research working paper 1620. Washington: World Bank.

Caselli, Francesco, Gerardo Esquivel, and Fernando Lefort. 1996. "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics." *Journal of Economic Growth* 1(3): 363–90.

Cavallo, Michele, and others. 2003. "Exchange Rate Overshooting and the Costs of Floating." New York University.

Corbo, Vittorio, and Patricio Rojas. 1993. "Investment, Macroeconomic Instability and Growth: The Latin American Experience." *Revista de Análisis Económico* 8(1): 19–35.

De Gregorio, José. 1992. "Economic Growth in Latin America." *Journal of Development Economics* 39(1): 59–84.

———. 1996. "Inflation, Growth and Central Banks: Theory and Evidence." Policy research working paper 1575. Washington: World Bank.

De Gregorio, José, and Pablo E. Guidotti. 1995. "Financial Development and Economic Growth." *World Development* 23(3): 433–48.

De Gregorio, José, and Jong-Wha Lee. 1999. "Economic Growth In Latin America: Sources and Performance." In *Economic Growth,* edited by Juan S. Blyde and Eduardo Fernández-Arias. Washington: Inter-American Development Bank.

———. 2002. "Education and Income Inequality: New Evidence from Cross-Country Data." *Review of Income and Wealth* 48(3): 395–416.

Deininger, Klaus, and Lyn Squire. 1996. "A New Data Set Measuring Income Inequality." *World Bank Economic Review* 10(3): 565–92.

Demirgüç-Kunt, Asli, and Enrica Detragiache. 1998. "The Determinants of Banking Crises: Evidence from Developing and Developed Countries." *IMF Staff Papers* 45(1): 81–109.

Dollar, David, and Aart Kraay. 2004. "Trade, Growth and Poverty." *Economic Journal* 114(493): F22–49.

Easterly, William, and Ross Levine. 2001. "It's Not Factor Accumulation: Stylized Facts and Growth Models." *World Bank Economic Review* 15(2): 177–220.

Edwards, Sebastian. 1995. *Crisis and Reform in Latin America: From Despair to Hope*. Oxford University Press for the World Bank.

Eichengreen, Barry, and Michael D. Bordo. 2002. "Crises Now and Then: What Lessons from the Last Era of Financial Globalization?" Working paper 8716. Cambridge, Mass.: National Bureau of Economic Research.

Eichengreen, Barry, Andrew K. Rose, and Charles Wyplosz. 1995. "Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks." *Economic Policy* 21 (October): 249–312.

Fernández-Arias, Eduardo, and Peter Montiel. 2001. "Reform and Growth in Latin America: All Pain, No Gain?" *IMF Staff Papers* 48(3): 522–46.

Fischer, Stanley. 1993. "The Role of Macroeconomic Factors in Growth." *Journal of Monetary Economics* 32(3): 485–512.

———. 1998. "The IMF and the Asian Crisis." Address prepared for the Forum Funds Lecture at the University of California at Los Angeles. Available at www.imf.org/external/np/speeches/1998/032098.htm.

Forbes, Kristin. 2000. "A Reassessment of the Relationship between Inequality and Growth." *American Economic Review* 90(4): 869–97.

Frankel, Jeffrey A., and David Romer. 1999. "Does Trade Cause Growth?" *American Economic Review* 89(3): 379–99.

Frankel, Jeffrey A. and Andrew K. Rose. 1996. "Currency Crashes in Emerging Markets: An Empirical Treatment." *Journal of International Economics* 41(3–4): 351–68.

Gavin, Michael, and Roberto Perotti. 1997. "Fiscal Policy in Latin America." In *NBER Macroeconomics Annual 1997,* edited by Ben Bernanke and Julio Rothemberg, pp. 11–60. MIT Press.

Glick, Reuven, and Michael M. Hutchison. 2001. "Banking and Currency Crises: How Common Are Twins?" In *Financial Crises in Emerging Markets,* edited by Reuven Glick, Ramon Morena, and Mark M. Spiegel. Cambridge University Press.

Gupta, Poonam, Deepak Mishra, and Ratna Sahay. 2002. "Output Response to Currency Crises." *IMF Staff Papers* 49 (special issue).

Hanushek, Eric A., and Dennis D. Kimko. 2000. "Schooling, Labor Force Quality, and the Growth of Nations." *American Economic Review* 90(5): 1184–208.

Heston, Alan, Robert Summers, and Bettina Aten. 2002. "Penn World Table Version 6.1." University of Pennsylvania, Center for International Comparisons.

IMF (International Monetary Fund). 1998. "Financial Crises: Characteristics and Indicators of Vulnerability." *World Economic Outlook. Financial Crises: Causes and Indicators,* chap. 4, 74–97. Washington.

———. 2002. *World Economic Outlook Database April 2002*. Washington.

———. 2004. *World Economic Outlook Database April 2004*. Washington.

Kaminsky, Graciela L., and Carmen M. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review* 89(3): 473–500.

Klenow, Peter J., and Andrés Rodríguez-Clare. 1997. "The Neoclassical Revival in Growth Economics: Has It Gone Too Far?" In *NBER Macroeconomics Annual 1997,* edited by Ben S. Bernanke and Julio Rotemberg, pp. 73–103. MIT Press.

Knack, Stephen, and Philip Keefer. 1995. "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7(3): 207–27.

Lee, Jong-Wha. 1993. "International Trade, Distortions, and Long-Run Economic Growth." *IMF Staff Papers* 40 (June): 299–328.

Lee, Jong-Wha, and Changyong Rhee. 2002. "Macroeconomic Impacts of the Korean Financial Crisis: Comparison with the Cross-Country Patterns." *World Economy* 25: 539–62.

Li, Hongyi, and Heng-Fu Zou. 1998. "Income Inequality Is Not Harmful for Growth: Theory and Evidence." *Review of Development Economics* 2 (October): 155–82.

Loayza, Norman, Pablo Fajnzylber, and César Calderón. 2004. "Economic Growth in Latin America and the Caribbean: Stylized Facts, Explanations, and Forecasts." Working paper 264. Santiago: Central Bank of Chile.

Lora, Eduardo, and Ugo Panizza. 2002. "Structural Reforms in Latin America under Scrutiny." Working paper 470. Washington: Inter-American Development Bank, Research Department.

Mankiw, N. Gregory., David Romer, and David N. Weil. 1992. "A Contribution to the Empirics of Economic Growth." *Quarterly Journal of Economics* 107(2): 407–37.

Mauro, Paolo. 1995. "Corruption and Growth." *Quarterly Journal of Economics* 110(3): 681–712.

Meltzer, Allan H., and Scott F. Richard. 1981. "A Rational Theory of the Size of Government." *Journal of Political Economy* 89(5): 914–27.

Milesi-Ferretti, Gian Maria, and Assaf Razin. 1998. "Sharp Reductions in Current Account Deficits: An Empirical Analysis." *European Economic Review* 42: 897–908.

Park, Yung Chul. 2001. "East Asian Dilemma: Restructuring out or Growing Out?" *Essays in International Economics* 223. Princeton University.

Park, Yung Chul, and Jong-Wha Lee. 2003. "Recovery and Sustainability in East Asia." In *Managing Currency Crises in Emerging Markets,* edited by Michael P. Dooley and Jeffrey A. Frankel. University of Chicago Press.

Perotti, Roberto. 1996. "Growth, Income Distribution, and Democracy: What the Data Say." *Journal of Economic Growth* 1(2): 149–87.

Perry, Guillermo, and Daniel Lederman. 1999. *Adjustments after Speculative Attacks in Latin America and Asia: A Tale of Two Regions?* Washington: World Bank.

Persson, Torsten, and Guido Tabellini. 1994. "Is Inequality Harmful for Growth? Theory and Evidence." *American Economic Review* 84(3): 600–21.

Pritchett, Lant. 1997. "Divergence, Big Time." *Journal of Economic Perspectives* 11(3): 3–17.

Rodríguez, Francisco, and Dani Rodrik. 2001. "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence." In *NBER Macroeconomics Annual 2000,* edited by Ben S. Bernanke and Kenneth Rogoff, pp. 261–325. MIT Press.

Rogoff, Kenneth, Carmen Reinhart, and Miguel Savastano. 2003. "Debt Intolerance." *Brookings Papers on Economic Activity* 1: 1–74.

Sachs, Jeffrey D., Aaron Tornell, and Andrés Velasco. 1996. "The Collapse of the Mexican Peso: What Have We Learned?" *Economic Policy* 11(22): 13–56.

Sachs, Jeffrey D., and John Williamson. 1985. "External Debt and Macroeconomic Performance in Latin America and East Asia." *Brookings Papers on Economic Activity* 2: 523–73.

Stiglitz, Joseph E. 2002. *Globalization and Its Discontents*. W. W. Norton and Company.

Summers, Robert, and Alan Heston. 1991. "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–1998." *Quarterly Journal of Economics* 106(2): 327–68.

Temple, Jonathan. 1999. "The New Growth Evidence." *Journal of Economic Literature* 37(1): 112–56.

Wacziarg, Romain, and Karen Horn Welch. 2003. "Trade Liberalization and Growth: New Evidence." Working paper 10152. Cambridge, Mass.: National Bureau of Economic Research.

WIDER (World Institute for Development Economics Research). 2000. *World Income Inequality Database,* version 1.0. Helsinki: United Nations University and United Nations Development Program. Available at www.wider.unu.edu/wiid/wiid.htm.

World Bank. 2000. *East Asia: Recovery and Beyond*. Washington.

Young, Alwyn. 1995. "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience." *Quarterly Journal of Economics* 110(3): 641–80.