

The Lost Decades:
Developing Countries' Stagnation in Spite of Policy Reform 1980-1998

William Easterly*

World Bank
send proofs to author:
1818 H Street, NW
MSN MC 3-301
Washington, DC 20433
(202) 473-8965
WEasterly@WorldBank.Org

February 2001

*I am grateful for comments from participants in the Global Development Network meeting in Cairo and in several World Bank seminars. I am also grateful for comments by Sara Calvo, Stephen O'Connell, Jorge Garcia Garcia, Lant Pritchett, Dani Rodrik, and Sergio Schmukler, and an anonymous referee. I am also grateful for diligent assistance from Hairong Yu. This paper utilizes a large cross-country, cross-time database Hairong Yu and I put together for the Global Development Network meeting. The data is available as the Global Development Network Growth Database at the web site www.worldbank.org/research/growth. Questions about the data can be addressed to Growth@WorldBank.org

Abstract: I document in this paper a puzzle that has not received previous attention in the literature. In 1980-98, median per capita income growth in developing countries was 0.0 percent, as compared to 2.5 percent in 1960-79. Yet I document in this paper that variables that are standard in growth regressions -- policies like financial depth and real overvaluation, and initial conditions like health, education, fertility, and infrastructure generally improved from 1960-79 to 1980-98. Developing country growth should have increased instead of decreased according to the standard growth regression determinants of growth. The stagnation seems to represent a disappointing outcome to the movement towards the “Washington Consensus” by developing countries. I speculate that worldwide factors like the increase in world interest rates, the increased debt burden of developing countries, the growth slowdown in the industrial world, and skill-biased technical change may have contributed to the developing countries' stagnation, although I am not able to establish decisive evidence for these hypotheses. I also document that many growth regressions are mis-specified in a way similar to the Jones (1995) critique that a stationary variable (growth) is being regressed on non-stationary variables like policies and initial conditions. It may be that the 1960-79 period was the unusual period for LDC growth, and the 1980-98 stagnation of poor countries represents a return to the historical pattern of divergence between rich and poor countries.

Keywords: Economic growth, policy reforms, economic stagnation, debt crisis.

JEL classification number: O1, O4.

Growth regressions have become a standard tool for explaining variations in growth. Yet they fail to explain the following remarkable facts. In 1960-79, the median per capita growth in developing countries was 2.5 percent. In 1980-98, the median per capita growth of developing countries was 0.0 percent.¹ In contrast, the standard determinants of growth in growth regressions like financial development, black market premiums, real overvaluation, educational attainment, life expectancy, fertility, and infrastructure got steadily more favorable for growth from the 60s through the 90s, as I will document. The fitted value from a growth regression on these factors (which I will present in a later section), diverges dramatically from actual growth in the 1980s and 1990s (Figure 1a).

The improvement in policy variables included in growth regressions reflect the sea-change beginning around 1980 towards increased emphasis on market-friendly economic policies by developing country governments. The development consensus shifted away from state planning towards markets, away from import substitution towards outward orientation, away from state controls of prices and interest rates toward “getting the prices right.”

The World Bank began “adjustment lending” in 1980, which was lending conditional on implementing the new consensus on economic policies. The IMF expanded its portfolio of conditional lending at about the same time. The two institutions made 958 adjustment loans to developing countries over 1980-98. Reflecting poor growth performance despite policy improvements, Paul Krugman (1995) noted that “the real economic performance of countries that had recently adopted Washington consensus policies...was distinctly disappointing.”

Growth projections throughout this period repeatedly forecast a return to the halcyon days of the 60s and 70s. For example, the 1983 *World Development Report* of the World Bank projected a “central case” of 3.3 annual percent per capita growth in the developing countries from 1982 to 1995. The most pessimistic scenario was a “low case” annual per capita growth rate of 2.7 percent over 1982-95.

Growth regressions have had considerable success explaining the cross-country variation in growth rates, and thus might potentially be of use in explaining the cross-time variation of growth as well. I don't attempt here to give a comprehensive survey of this vast literature (see Barro and Sala-I-Martin 1995), but merely to highlight some of the key right-hand side variables of choice. Barro (1991) started this large literature with a regression that emphasized initial income, primary and secondary enrollment, political instability, and deviations from purchasing power parity. In subsequent work, Barro (1998) has added fertility and life expectancy to the list of initial conditions affecting cross-country growth. Fischer (1993) added macroeconomic variables like the budget deficit, black market premium, and the inflation rate. King and Levine (1993a,b), Levine and Zervos 1993, and Levine, Loayza, and Beck (1999) have stressed financial development (most often measured by the ratio of M2 to GDP) as a robust causal determinant of economic growth. Dollar (1992) stressed a measure of real exchange rate overvaluation as a proxy for outward orientation and thus a determinant of growth. Easterly and Levine (1997a) add a measure of infrastructure development (telephone lines per capita) to the list of initial conditions affecting growth, following some earlier results by Canning and Fay 1993. Knack and Keefer 1995 highlighted the importance of well-developed institutions for growth performance. A large literature has described the

negative impact of initial inequality on growth (Alesina and Rodrik 1994, Persson and Tabellini 1994, Deininger and Squire 1998).² A related political economy variable is dependence on natural resource exports, which is said to deprive countries of the externalities to manufacturing activities and lead to a frenzy of rent-seeking (Sachs and Warner 1995, Tornell and Lane 1999, Manzano and Rigobón 2000, Gylfason 2000). All of these determinants of growth passed standard statistical tests of significance. The puzzle is that trends in these variables not only fail to explain the growth slowdown over time, but predict an acceleration of growth rates from the 60s to the 90s.

I see two main possible logical explanations for the failure of growth regressions to explain the cross-decade slowdown: (1) they are mis-specified, regressing stationary growth rates on non-stationary policies and initial conditions, along the lines of the Jones (1995) critique; and (2) some factor other than country characteristics led to the disappearance of growth. I will not be able to rule out the first hypothesis, of mis-specification of growth regressions, which calls into question many empirical studies of growth. Coefficients estimated on the basis of cross-section variation yield time series properties of the linear combination of growth determinants that are incompatible with the stationarity of growth. While you may grow faster than your neighbor if your secondary enrollment is higher, your own growth does not necessarily increase as your (and everyone else's) secondary enrollment ratios rise.

On the second possibility, this paper will offer some suggestive evidence of "another factor." The main "other factor" will be one that is not so surprising or unknown: the slowdown in growth in the industrial economies. This slowdown may have had a big effect on growth in the developing world, and econometrically it explains the

disappearance of growth in the developing world. A secondary factor also emanating from industrial countries was the rise in world interest rates that increased the debt burden of developing countries. However, I am not able to demonstrate a clear mechanism by which these external shocks translated into lower growth for the developing world. A variable that interacts OECD growth with the share of OECD trade in the economy is insignificant, for example.

Of course, there were also dramatic episodes that could “explain” the developing country slow down. The Third World debt crisis began with Mexico announcing it could not service its debt on August 18, 1982, after which commercial bank lending was cut off to many Third World debtors. African low income economies had their own debt crisis with official lenders from the early-1980s on. There was another financial crisis in Mexico in December 1994, which had a “Tequila effect” throughout the developing world. Then we had the financial crisis (beginning with the collapse of the Thai baht in July 1997) in 1997-98 in East Asia, which had an effect (“the Singha effect”?) in places ranging from Russia to Brazil. The problem with using these crises to explain the growth slowdown is that the crises are endogenous. They are more likely symptoms of the growth slowdown than its cause (as Easterly 2000 argues). In any case, I will examine trends in capital flows to test these stories.

The possible role of the industrial slowdown and the world interest rate suggests that external factors need to be given more attention relative to national economic policies. Easterly, Kremer, Pritchett, and Summers 1993 made an earlier argument for the importance of random shocks relative to national economic policies, based on the weak cross-period persistence of growth rates contrasted with the strong persistence of policies.

Pritchett 1998 also describes patterns of growth in developing countries reaching “plateaus” or remaining on “plains,” but again his emphasis is on cross-country variation rather than the aggregate performance of developing countries.

This paper is distinct from a study by Rodrik 1999 that asks the question “where did all the growth go?” He finds that countries that lacked a social consensus (proxied by ethnolinguistic fragmentation) and had poor institutions (which together with fragmentation he summarized as “social conflict”) suffered a strong negative impact from terms of trade losses. His paper presented cross-section results for the change in growth rates from the first half of the period to the second. His paper insightfully explained the variance around the mean growth decline, showing why some countries collapsed much more than others. Since regressions explain variation around the mean rather than the mean itself, his regression does not explain the mean growth decline itself -- 2 percentage points in his data. Even countries with zero social conflict on his measures had a significant decline in growth. This paper thus differs from Rodrik 1999 in its investigation of the mean cross-time pattern of growth as opposed to the cross-country variation of growth changes emphasized by Rodrik. I will also test the effect of terms of trade trends on developing country growth, but this turns out not to be a big part of the story for the aggregate growth trend.

What this paper does document is that, for whatever reasons, the response of developing country growth rates to the policy reforms of the 80s and 90s has not been what could have been expected from previous empirical work on growth. Zero per capita growth on average after major reforms is a disappointing outcome whatever the cause. As

a result of the poor countries' stagnation, poor and rich countries' incomes diverged over 1980-98.

The paper proceeds as follows. First, however, I will examine trends in policies and in proximate outcomes of policies. Then I will do panel growth regressions that include a shift factor for growth in the 80s and 90s, and see if this shift factor remains significant after controlling for policies and other factors.

1 Policy Trends

This section will describe the trends in national economic policies, as well as in indirect indicators of policies like educational attainment, life expectancy, infrastructure, and fertility. If the country characteristics that are supposed to affect growth in cross-country regressions trended upward, then obviously they cannot explain the slowdown in growth in the 80s and 90s.

There is much work documenting the effects of financial depth on growth.³ Figure 1 documents the trends in several relevant indicators. We see in Figure 1b that the ratio of M2/GDP rises steadily over time, and so was better in 1980-98 than in 1960-79 (in this and all the succeeding graphs, I show the 95 percent confidence bands for the median). The breakpoint for financial development was about 1985, after which it leveled off.

Figure 1c gives some insight as to how increasing financial depth came about, as real deposit rates in developing countries improved from the 70s to the 90s. The common practice of “financial repression”, where governments controlled interest rates at a level below that of inflation, had increasingly disappeared by the 80s and 90s.

Another huge improvement in “getting the prices right” in developing countries was in correcting overvaluation of the real official exchange rate. I take the index of

overvaluation for 1976-85 that Dollar 1992 calculates. Dollar's calculation was based on Summers-Heston purchasing power parity comparisons, measuring the extent of general overvaluation controlling for the level of income. He found this to be a significant determinant of growth rates (the more overvaluation, the less growth). I convert this into an annual series by calculating the real exchange rate as $(\text{Domestic CPI})/(\text{Exchange Rate Domestic Currency per Dollar} * \text{US CPI})$. I benchmark this series for each country by adjusting the level such that the average for 1976-85 equals Dollar's calculation.

Figure 2 shows the resulting aggregate trend in the real exchange rate. The median official real exchange rate was overvalued in the 60s and 70s, then was devalued steadily through the 80s and 90s. By the end of the period, the median real exchange rate was slightly undervalued in purchasing power parity terms.

But the strongest policy improvement of all in the developing world was in the outcomes for health, education, infrastructure, and fertility that resulted from national policies and technological progress. Figure 3a shows the huge improvement over time in secondary enrollment, whose initial value is often used as an explanatory variable in growth regressions (see Levine and Renelt 1992, Barro and Sala-I-Martin 1995 and Barro 1998). Other educational indicators sometimes used in growth regressions, like primary enrollment and educational attainment, showed similar improvements.

Figure 3a also shows the huge improvement in life expectancy, which is also used as an explanatory variable in growth regressions (e.g. Barro 1998), from the 60s through the 90s. Figure 3b shows similarly breathtaking improvement in the density of telephone networks, which has also been used as an explanatory variable in growth regressions (Easterly and Levine 1997a, Canning and Fay 1993), from the 60s through the 90s.

Figure 3c shows the drop in fertility in developing countries, which should have had a positive effect on growth according to the results of Barro 1998. Health, education, infrastructure, and fertility improvements should have led to an acceleration of developing country growth from the 60s through the 90s, not stagnation in 1980-98.

The government budget balance is significantly correlated with growth in previous research (Easterly and Rebelo 1993, Fischer 1993). Figure 4a shows the fiscal deficit excluding grants worsened in the 70s, reached a nadir in the early 1980s, and has then showed a steady improvement in the 80s and 90s.

Figure 4b shows the fiscal deficit including grants with similar trends, although the trends are less pronounced. The trends in budget balance should have predicted improving growth in the 80s and 90s, but it did not happen.

Institutional factors have been suggested as important determinants of long-run growth (Knack and Keefer 1994). We unfortunately have institutional indicators only back to 1984, but the data that we have show an improvement in institutional quality (Figure 5). There is nothing here to explain the lost decades.⁴

There were other policy indicators that did not necessarily show a clear improvement in the 80s and 90s, but fail to show the kind of deterioration that would explain the lost decades. Figure 6 a, b, and c shows the trends (or lack thereof) in the black market premium, the inflation rate, and openness. The black market premium does not display a strong trend, although its cross-country variance has decreased over time – by 1997, most countries had low black market premia (Figure 6a). Since the distribution of the black market premium is skewed, its mean (in this case, geometric mean) lies above the median.⁵ The mean declined steadily in the 90s. Inflation shifted up in the 70s,

which is the wrong timing to explain the growth slowdown that began in the 80s (Figure 6b). Also the median inflation remained at 15 percent or below, whereas the cross country evidence finds a negative correlation between growth and inflation only at higher levels.⁶ Since inflation, like the black market premium, is skewed to the right, its mean lies above the median. There was a sharp increase in the mean in the first half of the 90s, reflecting a small number of hyperinflation episodes, but then inflation declined again by the end of the 90s. The median is probably more informative about the experience of the typical country and so inflation fails to explain the median growth stagnation of 1980-98.

Figure 6c shows the behavior of openness (measured as the export to GDP ratio). Openness does not show strong trends over time; it rose in the early 90s and then fell in 1997-98 with the East Asia crisis. There is nothing here to explain the lost decades.

Part of the growth literature has focused on political economy variables that affect policy-making. One political economy variable said to be adverse for growth is income inequality (see literature review above). The median Gini coefficient for our sample falls from 49 in the 1960s to 41 in the 1990s. According to most empirical research, this should have prompted increased growth in the sample. A related political economy variable is dependence on commodity exports, which is said to be adverse for growth by various mechanisms, such as lacking the externalities associated with manufacturing or setting off a frenzy of rent-seeking. Dependence on commodity exports has fallen sharply in developing countries, with commodity exports as a share of total merchandise exports strongly trending downward over 1963-98 (figure 6d).⁷ The political economy environment for growth should have improved from the 1960s through the 1990s, according to measures standard in the literature.

In conclusion, poor policies are not a plausible candidate for explaining the lost decades. Policies either got better or remained the same throughout the period 1960-98.

2 *Shocks*

If it was not policies that explained the developing country growth slowdown, then what was it? I next turn to an examination of external shocks developing countries might have faced. One logical candidate is the terms of trade. After all, the most notable event around the time of the trend break in growth is the second oil shock in 1979. Figure 7 shows that there were indeed negative terms of trade shocks in 1974-75 and 1978-81. Growth continued to be robust after the first oil shock. The second oil shock is small in the typical developing country, however, amounting only to about one percent of GDP (remember the sample includes oil exporters as well as oil importers). It is possible that the second oil shock could have been the trigger for the developing countries' stagnation in the succeeding two decades. We will test this hypothesis more formally in the regression section of the paper. Contemporaneous terms of trade shocks do not seem to have been a factor, as there is a zero terms of trade shock in the stagnation period of the 80s and 90s for the typical developing country.

Another contender for the external shock that might have precipitated the developing country slowdown is the increase in real interest rates after the Volcker shock in 1979. Figure 8a shows the US real interest rate from 1960 to 1998. The pattern coincides closely with the developing country slowdown. Figure 8b shows the increased burden of interest payments on the external debt as a ratio to GDP associated with the

interest rate increase. The interest burden is a possible explanation of the LDC stagnation. I will test how much the interest rate shock mattered in the regression analysis below.

Another similar shock variable is the behavior of capital flows to developing countries. These will be endogenous, but it is still worth seeing how they behaved around the time of the developing country stagnation 1980-98. Figure 9a shows the behavior of net flows on debt from 1970-1997. There is the well known drop in the flow beginning with the 1982 debt crisis. However, flows recovered to their previous level after hitting a trough in 1987. The capital flow slowdown could help explain the 1980s' stagnation, but not the 1990s'. This conclusion is reinforced by examining portfolio capital flows (Figure 9b), which grew rapidly in the 90s for a sample of 35 developing countries with complete data over 1979-97. These flows are less relevant for the low income countries, but only reinforce the 1990s puzzle for the middle income countries.

The final logical candidate for an external shock that might have caused growth to slow down is the growth slowdown of the industrial economies. Although it is not so surprising that there could be an effect of industrial growth on developing countries, there are many closed economy growth models that do not have growth of the "leader" or "frontier" economies as a determinant of national growth rates. Figure 10 shows an unweighted 5-year moving average of growth rates in the industrial and in the developing economies. It is striking how the series move together. Not only do they move cyclically together, the industrial country slowdown mirrors (and precedes) the developing country growth slowdown. Of course, this begs the question of what caused the OECD growth slowdown (and also leaves open the possibility that both were affected by a third factor, like changes in world technology), which I do not attempt to resolve in this paper.

Another striking fact about the picture is that LDC growth rates spent most of the time well below the OECD growth rate. In the next section, I will formally test the effect of the OECD slowdown on LDC growth rates (and I will test for any possible reverse feedback of LDC growth on OECD growth).

3 *Growth regressions*

I now do growth regressions to more formally test the effect of policies and shocks on growth. Each regression will be on the developing country sample only, as that is the subject of the inquiry.

Table 1 shows a panel regression of decade averages for growth on decade averages for policies and beginning of decade values for initial conditions. I use the method of seemingly unrelated regressions to account for persistent errors across time for a given country. Growth is negatively related to initial income. This "conditional convergence" finding is standard in the literature. This contrasts with the absolute divergence between industrial and developing countries, as we have just seen above in Figure 10. We will come back to this growth gap at the end.

A higher black market premium, lower M2/GDP, more overvalued real exchange rate, lower secondary enrollment, and lower infrastructure provision (telephones is the specific proxy used here) are all associated with lower growth. Inflation is not significantly correlated with growth.⁸ I found the secondary enrollment variable to be significant, but not the Barro-Lee (2000) measure of years of schooling of the labor force.

However, as might be expected from the section on policy trends, policies do not explain the growth slowdown of the 80s and 90s. Growth in both the 80s and 90s was about 2.3 percentage points lower than in the 60s and 70s (see the coefficients on the

decade dummies for the 80s and 90s). The negative result for the 90s is not a result of the debacle of the transition economies, because they are not included due to lack of data. Moreover, the significance of the 80s and 90s decade dummies is not distorted by changes in sample from one decade to the next, as their magnitude and significance remains unchanged in a balanced panel.

Could it be that reverse causality explains the pattern we are observing -- perhaps countries improved their policies because growth was falling? However, when I do a three-stage least squares version of table 1, instrumenting for policies with their lagged values, virtually all policy variables remain significant and the dummies for the 80s and 90s remain highly significant.

Table 2 shows the effect of including terms of trade shock as percent of GDP in the system. Terms of trade shocks have a marginally significant impact on growth. However, as prefigured in the discussion of contemporaneous terms of trade shocks above, they do not explain the growth slowdown of the 80s and 90s. The decade dummies for the 80s and 90s are still highly significant. What about the idea that lagged terms of trade shocks might affect growth, as in the 70s oil shocks leading to the lost decade of 1980s growth? We can test this hypothesis with a lagged terms of trade shock as percent of GDP variable. This variable is well-suited to test the hypothesis as it measures the intensity with which the terms of trade shock was felt in each country. The variable switches sign and is only marginally significant. The oil shock hypothesis for developing country stagnation is not supported by the data.

I next tested for the effects of the interest rate shock mentioned earlier. The interest on external debt as a ratio to GDP has a statistically significant and negative

effect on growth. Including the interest rate shock in the growth regression diminishes the magnitude of the intercept shifts for the 80s and 90s, but does not eliminate their significance. The interest rate shock was a factor in the LDC stagnation, but not the whole story.

I also tried capital inflows (net debt flows/GDP) as a shock variable. It was insignificant and left the 80s and 90s decade dummies highly significant. Testing other popular debt crisis stories, I tried the initial debt burden at the beginning of each decade. It was insignificant. The interruption of capital flows and high external debt fail to explain the LDC stagnation of the 80s and 90s.

Table 3 adds the average growth rate of each country's OECD trading partners.

This is calculated as follows:

OECD Trading partner growth for country j = $\sum_i (\text{Share of OECD country } i \text{ in } j\text{'s OECD trade}) * (\text{Growth rate of OECD country } i)$

For the majority of developing countries, OECD countries have the dominant share of trade. The average share of OECD in developing country trade is 63 percent. Hence, this term is capturing an important growth shock, taking into account that different LDCs might have different OECD countries as trading partners. We would not expect any one developing country to have much of a reverse feedback effect on its OECD trading partners, so this variable is safely exogenous.⁹ In any case, I tested for feedback from LDCs to OECD countries by running the same specification as in table 3 for OECD countries, using the growth of their LDC trading partners as a RHS variable. I instrumented for LDC trading partners' growth with the LDC trading partners' terms of trade gains or losses (which are indeed a significant determinant of LDC growth in the

first stage regression). I failed to detect any causal effect running from LDC growth to OECD growth.

In contrast, the effect of OECD trading partner growth on LDCs' home country growth is huge (if anything, implausibly large). As shown in the first regression in table 3, one less percentage point of OECD trading partner growth is associated with 2.1 less percentage points of home country growth. The slowdown in OECD trading partner growth from 3.2 to 1.8 percentage points from 1960-79 to 1980-98 would then more than explain the 2.5 percentage points growth slowdown in developing countries. The variables measuring terms of trade shocks and interest rate shocks are still significant in this regression. However, the decade dummies for the 80s and 90s now become insignificant.

The next regression omits the interest rate shock variable so as to expand the sample to include the 1960s. The OECD growth variable remains highly significant (although reduced in magnitude), and the decade dummies remain close to zero (although the 70s decade dummy becomes marginally significant and positive).

To see how robust the effect of trading partners' growth is, I test different functional forms for the variable. I use the trade-weighted growth rate of all trading partners for each country. This variable remains highly significant (in the third regression in table 3), and again diminishes the decade shifts to zero. I also tried interacting the OECD growth rate with the home country ratio of OECD trade to GDP. This variable was not statistically significant (nor was the total home country trade share interacted with growth of all trading partners), suggesting that the weight of trade in the economy does not necessarily capture the channel by which foreign growth affects home country

growth. This leaves open the possibility that some third worldwide factor may be influencing both OECD and developing country growth.

4. Stationarity of growth and growth determinants, possible mis-specification, and divergence

Another possible resolution of the puzzle of the over-predicted growth in the 80s and 90s may be that growth regressions of the type run in this paper (which is representative of many other papers) may be mis-specified. As Jones 1995 pointed out, we should reject a theory that relates a stationary variable (growth) to a non-stationary variables (R&D spending in his example). I have a number of non-stationary variables on the right-hand side of the growth regression in Table 1: financial depth, secondary enrollment, telephone lines per 1000, and initial income (and such variables are ubiquitous in other scholars' growth regressions as I've already indicated).

Note however that the inclusion of these non-stationary variables does not automatically indicate mis-specification. If the coefficients of these variables in the growth regression represent a cointegrating vector, then the linear combination of these variables would be stationary. To be concrete, income has a negative sign and the other three variables have positive signs. The variables financial depth, secondary enrollment, and telephone lines may be stationary when measured relative to income, weighted by the coefficient values from the regression. To see if this is so, I calculate the linear combination of the right-hand side variables at the coefficient values from the growth regression. Then I examine the resultant time series from 1960 to 1998 for 69 developing countries that have sufficient data.

The results do indeed suggest a mis-specification problem. Using the Dickey-Fuller test, we fail to reject a unit root in 65 of the 69 country time series of linear combinations of right-hand side variables at the 5% level (or even much weaker significance levels in most cases). The measured positive effect of the upward trend in secondary enrollment, telephone lines, and financial depth dominates the negative effect of the rise in income. If current trends in these variables continue, we would expect to see continuing acceleration of growth, which is unreasonable. In contrast, we can reject a unit root in 63 out of 69 series on per capita growth rates, so the evidence is overwhelming that growth is stationary (as Jones 1995 also found). This mis-specification suggests that extrapolating from the coefficients estimating from cross-section regressions on secondary enrollment, telephone lines, and financial depth to a time series prediction that growth will accelerate as these variables rise relative to income is unreasonable. Growth regressions should use econometric methods that correct for non-stationarity of the explanatory variables.

It might be that non-stationary variables like secondary enrollment and telephone lines (and other trending variables like population growth and life expectancy) have an effect on the level of income rather than the rate of growth. This is the prediction of the neoclassical model as expounded in Mankiw, Romer and Weil 1992 and others. However, even this prediction fails during the last two decades when per capita income stagnated despite the improvements in neoclassical income determinants documented here. Nor is the other determinant of per capita income in the neoclassical framework -- investment/GDP -- any help, as it shows a slight upward trend over the period, apart from a temporary surge and decline around 1975-84 (Figure 11).

We could think of several economic reasons why the growth equation is mis-specified, that is, why policy reforms that explain cross-country variation do not predict intertemporal improvement when reforms are implemented in all countries. If the allocation of worldwide financial (and other kinds of) capital is an important factor in growth, then one's *relative* policy performance may be what matters. Hence all countries reforming together will not increase their average growth rate. Alternatively, cross-country indicators like educational enrollment, infrastructure, black market premiums, real exchange overvaluation, etc. may simply be symptoms of deeper cross-country differences in societal characteristics adverse for growth – like ethnic conflict. Resolving the symptoms of the societal dysfunction does not cure the dysfunction itself, and so intertemporal improvements in some of these indicators do not predict increased growth potential. Igniting growth in developing countries may require (probably slow) progress towards what the literature has variously called “social capital,” “social cohesion”, or “social infrastructure” (Hall and Jones 1999, Ritzen, Easterly, and Woolcock 2000).

Still this mis-specification does not completely resolve the puzzle of the developing countries' stagnation in the 80s and 90s. Why did growth decline by 2.5 percentage points compared to the 60s and 70s when even the stationary policy variables were no worse, and many were better? If conditional convergence rests in part upon a mis-specification, then perhaps it's relevant to look at absolute convergence. As Figure 12 shows, the 1980-98 period was one of strong absolute divergence. This suggests another possible view: it was not 1980-98 that was exceptional, but 1960-79! After all, poor nations had mainly stagnated prior to 1960, which is why they were still poor in 1960. The experience of the last two decades may mark a return to "Divergence, Big

Time" between rich and poor nations, to use the phrase of Pritchett (1997). The LDC growth during 1960-79 may have reflected the adoption in developing countries of undemanding technologies of mass production that did not place a premium on skill level. Skill-biased technological advances of the 80s and 90s may have favored the countries that were already developed, leaving behind the poor countries (see Acemoglu and Zilibotti 2001)-- as happened in previous technological revolutions.

5. *Conclusion*

This paper documented a significant puzzle in empirical growth research: the stagnation of the typical developing country in the 80s and 90s, despite policy reforms that according to growth regressions should have led to accelerating, not falling, growth.

The conclusions of this paper are subject to several possible interpretations. The OECD slowdown may have caused the LDC slowdown. Or the slowdown in both OECD and LDC economies could reflect common shocks rather than the OECD shock causing the LDC shock. Alternatively, I have shown that the significance of the 80s and 90s decade dummies in regressions omitting OECD growth reflects in part mis-specification rather than shocks. Specifically, upward-trending variables like secondary enrollment, financial depth, and telephone density are not consistent with stationary growth rates. Many growth regressions in the literature were mis-specified, and hence led to unrealistic expectations for the 80s and 90s.

The fact remains that many, even stationary, country characteristics widely thought to be favorable for growth (or at least favorable for level of income) have improved, yet developing countries on average have stagnated. This in itself is a blow to the optimism surrounding the "Washington Consensus" prior to the experience of the last

two decades. It may be that what was exceptional was the 1960-79 period, and that the 1980-98 period represents a return to the long-run tendency of rich and poor countries to diverge (Pritchett 1999).

The evidence in this paper suggests a high degree of uncertainty about the future prospects of developing countries. If OECD growth has been an important influence on LDC growth, then an upswing in OECD growth associated with the E-commerce revolution could augur well for the LDCs.¹⁰ If the new technology totally displaces the old, then at least some backward countries could leapfrog to the technological frontier. On the other hand, each technological revolution creates its own pattern of convergence or divergence. If the current technological revolution favors those who are already developed, then we could see continuing poor prospects for growth in developing countries. Fortunately for this paper, academic studies do not have to predict the future, but only document the past. What is clear is that the 1980-98 stagnation of LDCs was a major disappointment after all the policy reforms of the 80s and 90s.

Bibliography

- Acemoglu D. and F. Zilibotti. (2001). "Productivity Differences," Quarterly Journal of Economics, 115(3), forthcoming.
- Aghion, Philippe and Peter Howitt. (1998). Endogenous Growth Theory. Cambridge, MA: MIT Press.
- Alesina, Alberto and Dani Rodrik. (1994). "Distributive Politics and Economic Growth," Quarterly Journal of Economics 109, 2, 465-90
- Barro, Robert J. (1998). Determinants of Economic Growth: A Cross Country Empirical Study. Cambridge, MA: MIT Press.
- Barro, Robert J. and Xavier Sala-i-Martin. (1995). Economic Growth. New York: McGraw-Hill.
- Barro, Robert J. (1991). "Economic Growth in a Cross Section of Countries," Quarterly Journal of Economics 106, 2, 407-443
- Bruno M. and W. Easterly. (1998). "Inflation Crises and Long-run Growth," Journal of Monetary Economics 4, 3-26.
- Canning, David, and Marianne Fay. (1993). "The Effect of Transportation Networks on Economic Growth," Discussion Paper Series, Columbia University, Dept. of Economics.
- Cohen, Stephen S. J. Bradford DeLong, and John Zysman. (1999). "An E-conomy." http://econ161.berkeley.edu/OpEd/virtual/technet/An_E-conomy .
- David, Paul and Gavin Wright. (1999). "General Purpose Technologies and Surges in Productivity: Historical Perspectives on the Future of the ICT Revolution," <http://www-econ.stanford.edu/faculty/workp/swp99026.pdf>.
- Deininger, Klaus and Lyn Squire. (1998). "New Ways of Looking at Old Issues: Inequality and Growth," Journal of Development Economics 57,2, 259-287.
- Deininger, Klaus and Pedro Olinto. (2000). "Asset Distribution, Inequality, and Growth," World Bank, Development Research Group, Working Paper #2375.

- Dollar, David. (1992). "Outward-oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-1985," Economic Development and Cultural Change, 40, 3, 523-544.
- Durlauf Steven and Danny Quah. "The New Empirics of Economic Growth." Forthcoming in John Taylor and Michael Woodford (eds), Handbook of Macroeconomics. Forthcoming.
- Easterly, William. (2000). "Growth Implosions and Debt Explosions: Do Growth Slowdowns Cause Public Debt Crises?" World Bank, Development Research Group, Working Paper #2531.
- Easterly, William and Ross Levine. (2001). "It's Not Factor Accumulation: Stylized Facts and Growth Models," forthcoming, World Bank Economic Review, 2001.
- Easterly, William and Ross Levine. (1997a). "Africa's Growth Tragedy: Policies and Ethnic Divisions," Quarterly Journal of Economics November.
- Easterly, William and Ross Levine. (1997b). "Troubles with the Neighbors: Africa's Problem, Africa's Opportunity," Journal of African Economies 7, 1, 120-142.
- Easterly, William, Michael Kremer, Lant Pritchett, and Lawrence Summers. (1993). "Good Policy or Good Luck? Country Growth Performance and Temporary Shocks," Journal of Monetary Economics 32, December, 459-483.
- Easterly William and Sergio Rebelo. (1993). "Fiscal Policy and Economic Growth: an Empirical Investigation," Journal of Monetary Economics 32, December, 417-458.
- Fischer, Stanley. "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics, XXXII (1993), 485-511.
- Forbes, Kristin. (2000). "A Reassessment of the Relationship Between Inequality and Growth," forthcoming American Economic Review.
- Fujita, Masahisa, Paul Krugman, and Anthony J. Venables. (1999). *The Spatial Economy: Cities, Regions and International Trade*. Cambridge, Mass.: MIT Press.

- Grossman, Gene M. and Elhanan Helpman. (1991). *Innovation and Growth in the Global Economy*. Cambridge, Mass.: MIT Press.
- Gylfason, Thorvaldur. (2000). "Natural Resources, Education, and Economic Development," Center for Economic Policy Research Working Paper No. 2594, October.
- Hall, Robert and Chad Jones. (1999). "Why Do Some Countries Produce So Much More Output than Others?" Quarterly Journal of Economics, February, CXIV, 1, 83-116.
- Jones, Charles I. (1995). "Time Series Tests of Endogenous Growth Models," Quarterly Journal Of Economics, 110, 495-525.
- King, Robert G. and Ross Levine. (1993a). "Finance and Growth: Schumpeter Might be Right," Quarterly Journal Of Economics, 108, 717-737.
- King, Robert G. and Ross Levine. (1993b). "Finance, Entrepreneurship, and Growth: Theory and Evidence," Journal Of Monetary Economics, 32, 513-542.
- Knack, Stephen and Philip Keefer. (1995). "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures," Economics and Politics, 7, 3, 207- 227.
- Krugman, Paul. (1995). "Dutch Tulips and Emerging Markets," Foreign Affairs, 74, 4, 23-44.
- Krugman, Paul R. and Anthony J. Venables. (1995). "Globalization and the Inequality of Nations," Quarterly Journal of Economics, November, 857-80.
- Levine, Ross, Norman Loayza, and Thorsten Beck. (1999). "Financial Intermediation and Growth: Causality and Causes," World Bank Policy Research Working Paper 2059.
- Levine, Ross and Sara Zervos. (1998). "Stock Markets, Banks, and Economic Growth," American Economic Review, 88, 537-58.
- Levine, Ross and Sara J. Zervos. (1993). "What We Have Learned about Policy and Growth from Cross-Country Regressions?" American Economic Review, 83, 2, 426-430.
- Levine, Ross, and David Renelt. (1991). "Sensitivity Analysis of Cross-Country Growth Regressions," American Economic Review, XXC, 942-963.

- Mankiw, N. Gregory, David Romer, David N. Weil. (1992). "Contribution to the Empirics of Economic Growth," Quarterly Journal Of Economics, 107, 407-437.
- Manzano, Osman and Roberto Rigobón. (2000). "Resource Curse or Debt Overhang?" paper presented at MIT Energy Lab conference, November.
- Persson, Torsten and Guido Tabellini. (1994). "Is Inequality Harmful for Growth?" American Economic Review, 84, 3, 600-621.
- Pritchett, Lant. (1998). "Patterns of Economic Growth: Hills, Plateaus, Mountains, and Plains," Policy Research Working Paper Number 1947.
- Pritchett, Lant. (1997). "Divergence, Big Time," Journal of Economic Perspectives, 11, 3-17.
- Quah, Danny. (1997). "Increasingly Weightless Economies," Bank of England Quarterly Bulletin, 37, 1, 49-56.
- Rebelo, Sergio. (1991). "Long Run Policy Analysis and Long Run Growth," Journal Of Political Economy, 99, 500-521.
- Ritzen, Jo, William Easterly, and Michael Woolcock. (2000). "On Good Politicians and Bad Policies: Social Cohesion, Institutions, and Growth," World Bank mimeo.
- Rodrik Dani. (1999). "Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses," Journal of Economic Growth, 4, 4, 385-412.
- Sachs, Jeffrey and Andrew Warner. (1995). "Natural Resource Abundance and Economic Growth," NBER Working Paper 5398.
- Tornell, Aaron and Philip Lane. (1999). "The Voracity Effect," American Economic Review, 89, 22-46.
- World Bank. (2000). Global Development Finance 2000. Washington DC.
- World Bank. (2000). World Development Indicators 2000. Washington DC.

Table 1: Per capita growth in developing countries**regressed on policies and initial conditions**

Estimation Method: Seemingly Unrelated Regression

with decade averages

Coefficient t-Statistic

Intercept	0.1185	3.92
BLACK MARKET PREMIUM	-0.0092	-2.30
M2/GDP	0.0003	2.38
INFLATION	-0.0074	-1.01
REAL EXCHANGE RATE	-0.0091	-2.41
SECONDARY ENROLLMENT	0.0003	2.39
INITIAL INCOME	-0.0158	-3.47
TELEPHONE LINES PER 1000	0.0055	2.34
Shift 70s	-0.0021	-0.51
Shift 80s	-0.0239	-6.07
Shift 90s	-0.0231	-4.87
	R2	Obs
1960s	.18	34
1970s	.27	55
1980s	.25	70
1990s	.11	61

Table 2: Per capita growth in developing countries regressed on policies, initial conditions, and terms of trade and debt shocks

Estimation Method: Seemingly Unrelated Regression

Terms of trade variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
	contemporaneous		lagged 1 decade		contemporaneous	
Intercept	0.1146	3.70	0.0635	1.76	0.0900	2.89
BLACK MARKET PREMIUM	-0.0099	-2.44	-0.0100	-2.31	-0.0174	-4.18
M2/GDP	0.0004	2.74	0.0003	2.45	0.0005	3.51
INFLATION	-0.0077	-1.01	-0.0118	-1.49	-0.0018	-0.24
REAL EXCHANGE RATE	-0.0090	-2.37	-0.0111	-2.74	-0.0095	-2.40
SECONDARY ENROLLMENT	0.0003	2.44	0.0003	2.41	0.0003	2.39
INITIAL INCOME	-0.0154	-3.28	-0.0078	-1.41	-0.0119	-2.48
TELEPHONE LINES PER 1000	0.0052	2.19	0.0023	0.77	0.0050	1.88
Terms of trade gain as % of GDP	0.1628	1.90	-0.1658	-1.94	0.1846	2.28
Interest on external debt as % of GDP					-0.0036	-3.82
Shift 70s	-0.0033	-0.79				
Shift 80s	-0.0234	-5.71	-0.0218	-6.46	-0.0130	-3.27
Shift 90s	-0.0243	-5.00	-0.0202	-4.38	-0.0181	-4.04
	R2	Obs:	R2	Obs:	R2	Obs:
60s	.19	31				
70s	.32	50	.21	44	.47	48
80s	.26	68	.39	60	.37	67
90s	.17	60	.21	60	.21	60

Table 3: Per capita growth in developing countries regressed on policies, initial conditions, and trading partner growth rates

Estimation Method: Seemingly Unrelated Regression

	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	0.0236	0.71	0.0634	1.93	0.0907	2.96
BLACK MARKET PREMIUM	-0.0153	-4.02	-0.0095	-2.54	-0.0081	-2.11
M2/GDP	0.0004	3.31	0.0003	2.53	0.0003	2.10
INFLATION	-0.0014	-0.21	-0.0087	-1.24	-0.0099	-1.38
REAL EXCHANGE RATE	-0.0087	-2.36	-0.0080	-2.22	-0.0081	-2.23
SECONDARY ENROLLMENT	0.0003	2.40	0.0003	2.51	0.0003	2.42
INITIAL INCOME	-0.0105	-2.33	-0.0150	-3.36	-0.0161	-3.52
TELEPHONE LINES PER 1000	0.0054	2.13	0.0062	2.62	0.0067	2.78
Terms of Trade gain as % of GDP	0.2125	2.45	0.1659	1.86	0.0487	1.51
Interest on external debt as % of GDP	-0.0029	-3.28				
OECD TRADING PARTNER GROWTH	0.0210	3.56	0.0121	3.24		
All Trading Partner Growth					0.0076	2.93
Shift 70s			0.0123	1.87	0.0042	0.88
Shift 80s	-0.0021	-0.40	-0.0010	-0.12	-0.0081	-1.18
Shift 90s	0.0046	0.60	0.0047	0.46	-0.0087	-1.25
	R2	Obs:	R2	Obs:	R2	Obs:
60s			.20	31	.26	31
70s	.49	44	.36	46	.38	46
80s	.47	64	.36	65	.32	65
90s	.27	59	.21	59	.16	59

Figure 1a: Predicted vs actual per capita growth for developing countries (assuming constant intercept across decades)

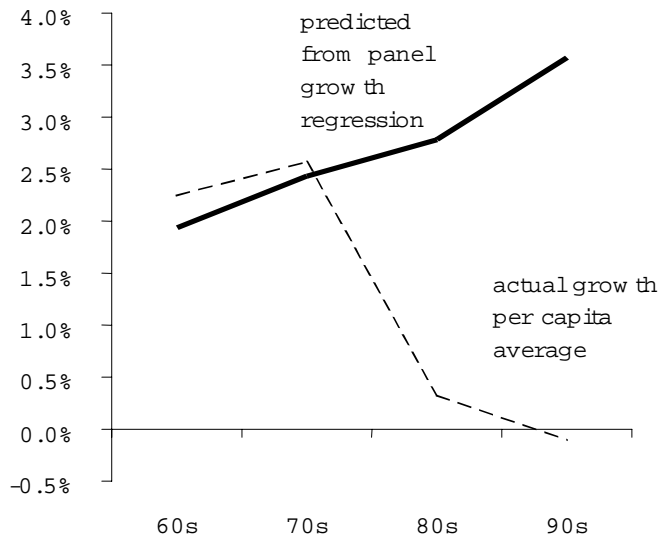


Figure 1b: Confidence Median M2/GDP in Countries

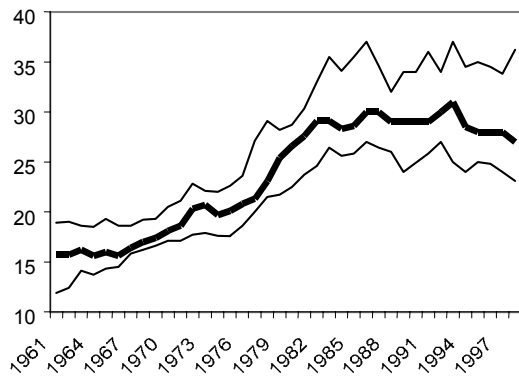


Figure 1c: Confidence Interval for Median Real Interest Rate in Developing Countries

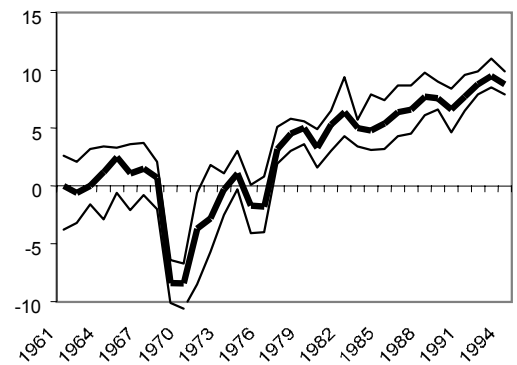


Figure 2: Confidence Interval for Median Real Exchange Rate in Developing Countries



Figure 3a: Median human capital measures in developing economies

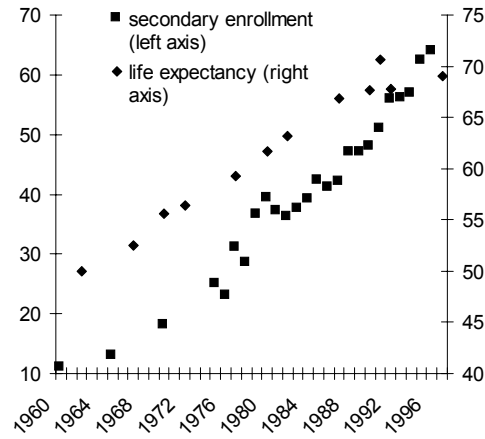


Figure 3b: Median telephone lines per 1000 population

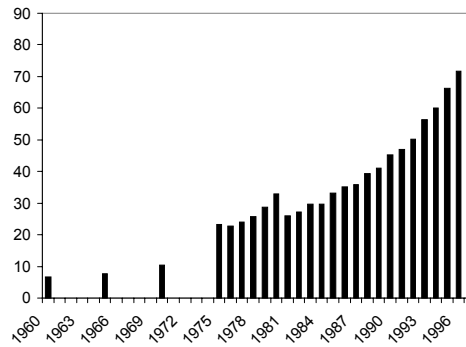


Figure 3c: Median Fertility rate in Developing Countries (births per woman)

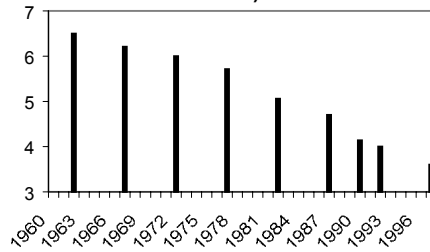


Figure 4a: Confidence Interval for Median Budget Balance (excluding Grants) in Developing Countries



Figure 4b: Confidence Interval for Median Budget Balance (including Grants) in Developing Countries

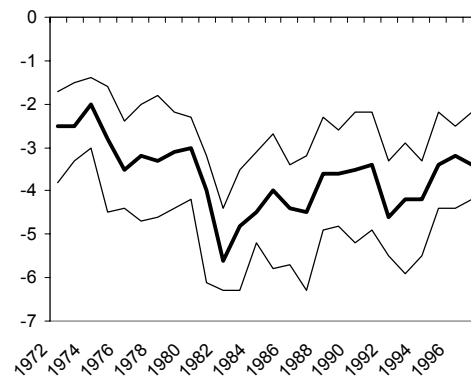


Figure 5: Median institutional measures in developing countries

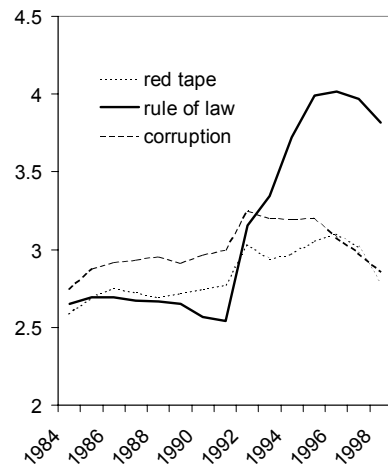


Figure 6a: Confidence Interval for Median Black Market Premium in Developing Countries

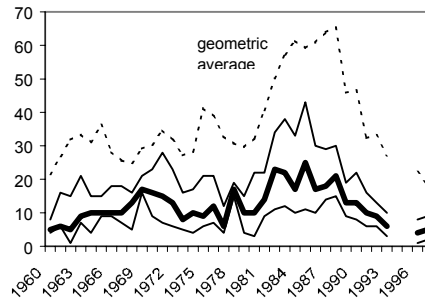


Figure 6b: Confidence Interval for Median Inflation in Developing Countries

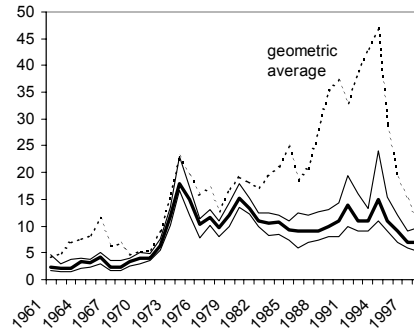
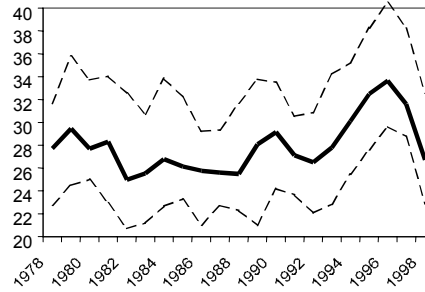


Figure 6c: Median Export to GDP Ratio in Developing Countries



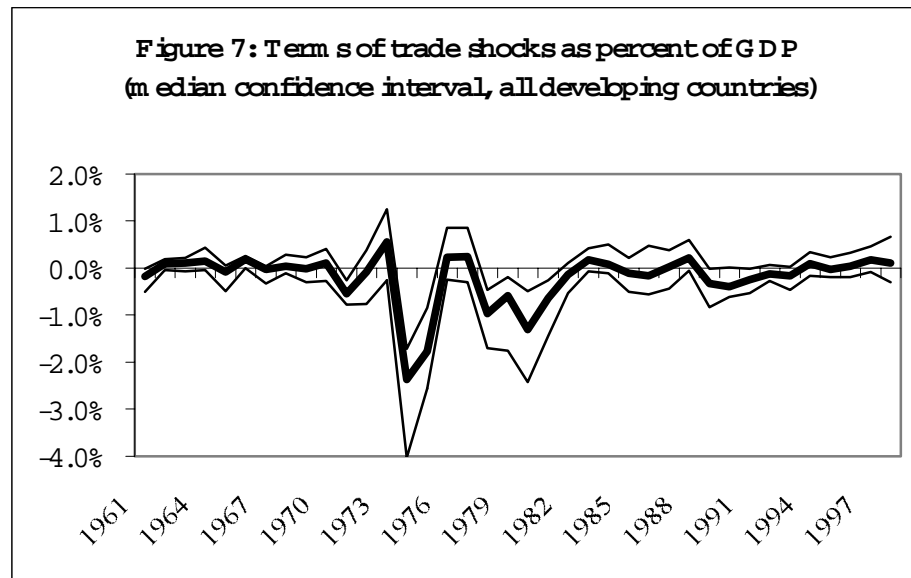
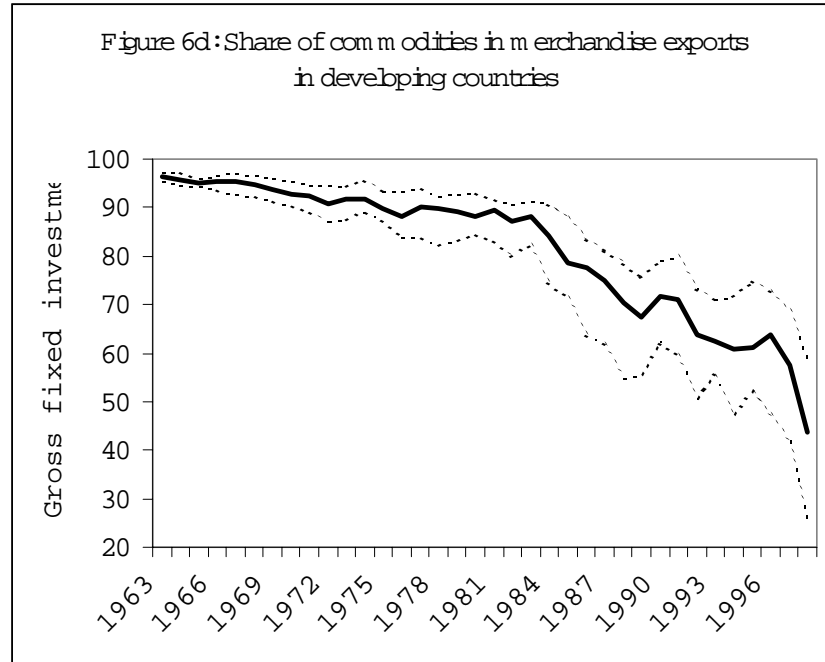


Figure 8a: Real Interest Rate in United States

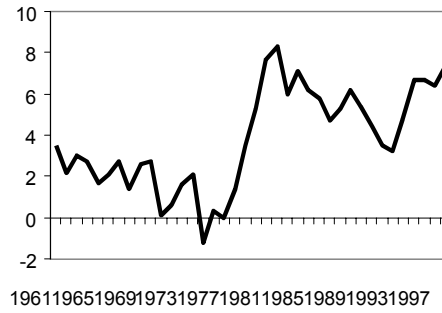


Figure 8b: Interest on external debt as ratio to GDP, confidence interval for median for developing countries

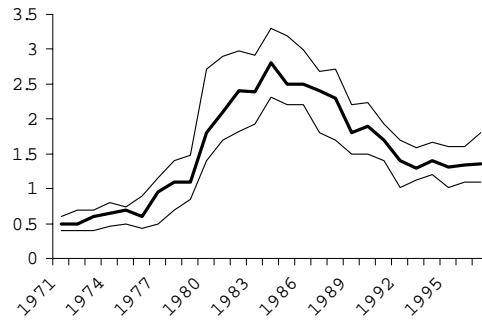


Figure 9a: Net flows on external debt to 90 developing countries in billions of 1995 dollars

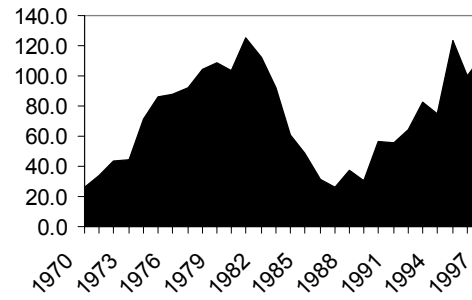
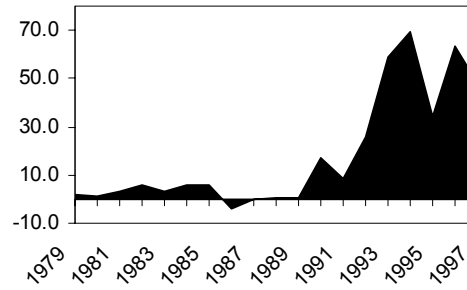
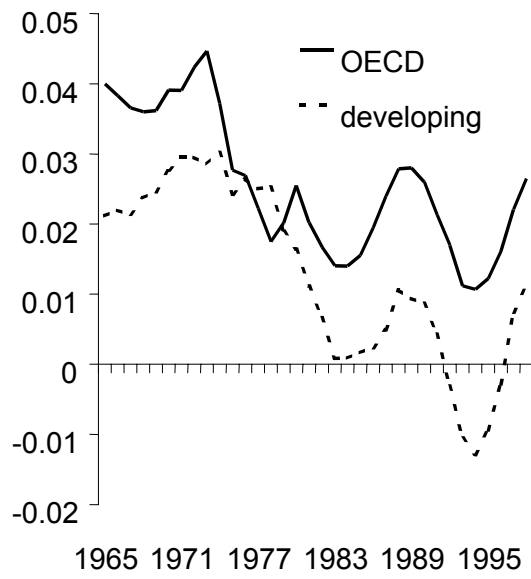
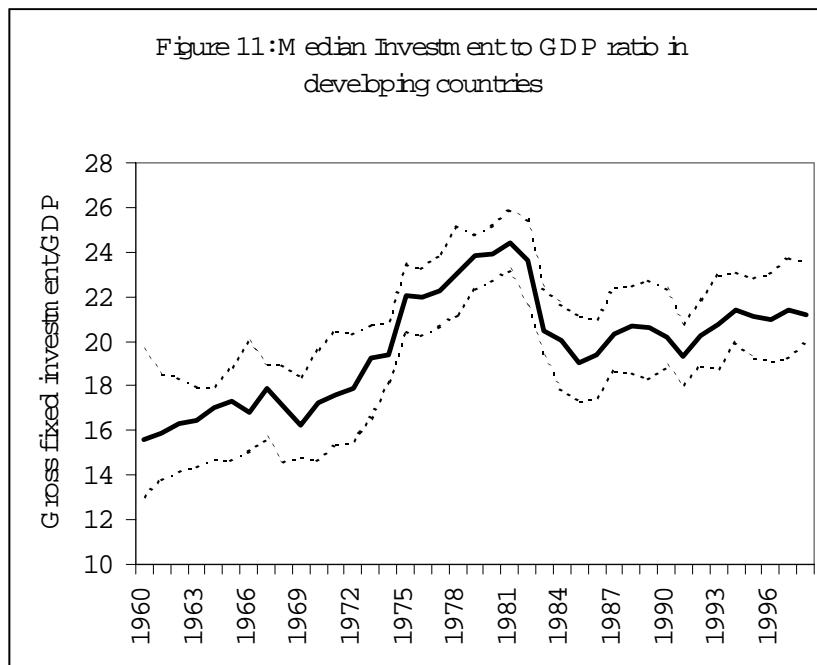


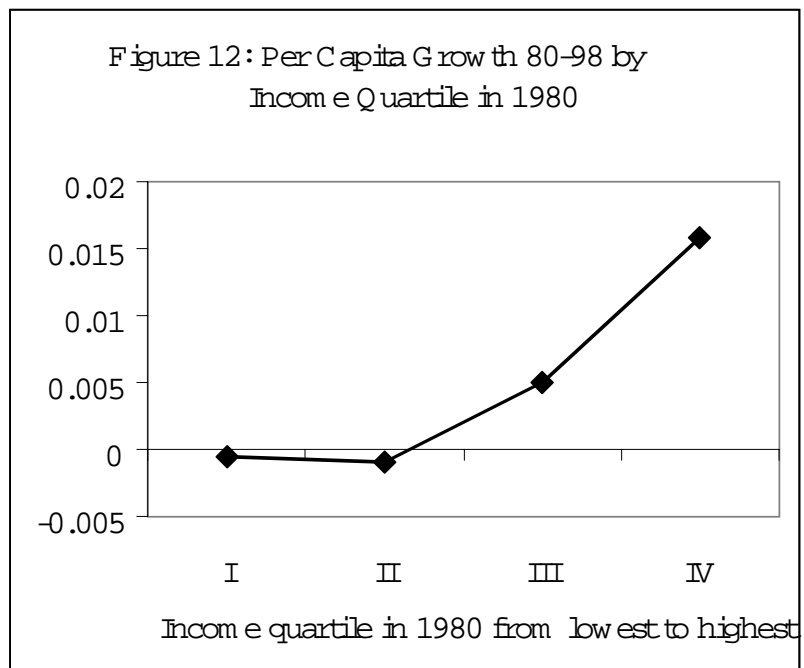
Figure 9b: Portfolio investment in 35 developing economies in billions of 1995 dollars



**Figure 10: Per capita growth in
OECD and Developing Economies
(5-year moving average)**







Notes

-
- ¹ The median weights all countries equally, which seems appropriate if we treat each country as an observation of a given set of country policies and characteristics. The median is 0.0 for both the 80s and 90s taken separately. The weighted average growth rate shows less of a decline, because of accelerated growth in India and China in 1980-98. The 1980-98 figures include the ex-Communist countries in Europe and Central Asia that had strong output declines. Excluding developing countries from Europe and Central Asia, the median per capita growth 1980-98 was still only 0.3 percent.
- ² The findings on the negative effect of inequality on growth have been recently attacked by Forbes 2000, who was in turn counter-attacked by Deininger and Olinto 2000.
- ³ King and Levine 1993a,b, Levine and Zervos 1998, Levine, Loayza, and Beck 1999
- ⁴ I also checked a measure of political instability, revolutions per year, but it displays no trend over 1960-93.
- ⁵ The geometric mean is calculated as $\text{EXP}(\text{MEAN}(\text{LOG}(P(t)/P(t-1))))-1$
- ⁶ Bruno and Easterly 1998 find no robust evidence of a negative correlation between inflation and growth below 40 percent per annum; Barro 1998 finds a lower breakpoint of 15 percent per annum, below which there is no significant correlation between growth and inflation.
- ⁷ World Bank, World Development Indicators 2000.
- ⁸ As pointed out earlier, Bruno and Easterly 1998 find that the cross-section relationship between growth and inflation is zero on average. They explain this by the pattern of sharp output declines associated with “inflation crises”, with output reverting to trend after the end of the inflation crisis. Levine and Zervos 1994 also find inflation not to be robustly related to growth.
- ⁹ Easterly and Levine 1997b have a finding somewhat related to this: an effect of neighboring countries’ growth rates on the home country, for the entire cross-country sample. Another possible explanation for the trading partner growth effect could be common shocks that affected both OECD and developing countries.
- ¹⁰ For descriptions of the potential of the E-revolution, see Cohen et al. 1999, David and Wright 1999 and Quah 1997.