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On the Determinants of Economic Growth

Rebelo, Sergio

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Sérgio Rebelo

University of Rochester
N.B.E.R. and C.E.P.R.

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Abstract

The fate of different countries is amazingly diverse. Some economies expand at a fast pace, quickly developing new sectors and introducing new products and technologies. Workers see their standard of living increase, while soaring stock markets reward domestic savings and attract eager foreign investors.

In other economies everything goes wrong. Investment is scarce and flows often to technologically outdated sectors. Workers see little change in their standard of living; they have the same jobs and perform the same tasks as their parents. Investors see their capital earn meager rewards. The only sure ways to succeed seem to be across the border; domestic savings fly abroad in search of better returns and workers migrate in search of higher wages.

Growth theory tries to identify the source of this diversity in growth performance and provide usable policy advice. In the last fifteen years there have been a large number of researchers engaged in developing what became known as "endogenous growth theory". The goal of this research program has been to improve on the models built in the 50's and 60's, which left two of the key factors underlying economic growth--technological progress and population growth--unexplained. The new work on growth theory resulted from the combination of novel theoretical insights with the availability of new data sets, which allowed researchers to test their theories and search for new empirical regularities.

This paper reports on the progress made by this new body of literature in answering the question "Why do Growth Rates Differ?" It reviews what we currently know about the mechanics of growth miracles and of poverty traps, as well as the tentative policy advice that these mechanics suggest.

Journal of Economic Literature Classification: E10, 010
Keywords: Economic growth, capital accumulation, innovation, human capital

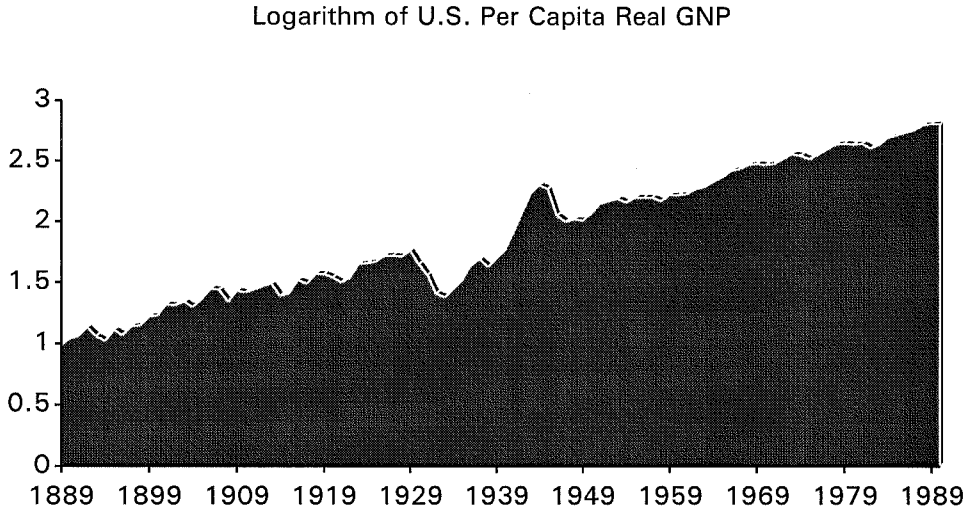
1. Introduction

Anyone who follows the economy by reading the financial press might be led to think that business cycles, the mechanics of expansions and recessions, are the most important policy problem facing any government. Forecasts of the end of an expansion or analyses of what is causing a recession tend to make the headlines of the financial press and be allocated prime time in televised news programs.

There is a common perception that the evolution over time of national income resembles a sine wave, or a roller coaster ride; that it is dominated by highs and lows, booms and busts. Nothing could farther from the truth. Although short term fluctuations in output and employment seem to always be on the spotlight, the most salient fact about national income in most countries is that it grows over time.

Figure 1 shows US. per capita GDP between the period of 1889 and 1990. Even though this period includes the Great Depression and the two World Wars, the most notable empirical regularity that this figure suggests is the steady rise in income that the US economy has experienced.

FIGURE 1



The income of an average American in 1990 was 1.8 times higher than in 1960, 3.2 higher than in 1930 and 7 times higher than in 1870. If the US manages to sustain its current rate of growth its per capita income will double every 35 years. This is an amazing performance by historical standards. It is also an impressive performance when compared to that of the least dynamic economies in the word, described in Table 1. In countries such as the Central African Republic or Guyana, time seems to stand still. Little, if any, economic progress, takes place from generation to generation.

But by the standards of the growth miracles witnessed in the last three decades, US growth seems painfully slow. Table 1 also reports the rates of expansion for the world's most dynamic economies between 1960 and 1985. At its current rate of growth the Singapore economy doubles its income every 11 years! If this rate of expansion were maintained, the income level of Singapore's next generation would be rouglhy 80 times higher than its current level.

TABLE 1

The 10 Most Dynamic Economies

Hong Kong (6.5%), Singapore (6.4%), Hong-Kong (6.2%), Taiwan (6.1%), Malta (5.4%), Japan (5.3%), Bostwana (4.9%), Portugal (4.7%), Thailand (4.6%), Malasya (4.4%) amd Cyprus (4.4%)

The 10 Least Dynamic Economies

Madagascar (-2.1%), Chad (-1.93%), Mozambique (-1.5%), Somalia (-1.2%) Central African Republic (-1%), Angola (-1%), Zambia (-0.9%), Guyana (-0.9%), Sierra Leone (-0.6%), Nicaragua (-0.4%), Burundi (-0.4%), Haiti (-0.4%)

The number in parenthesis indicates the Annual Growth Rate of Per Capita Real GDP, 1960-1992.

Source: Updated version of Summers and Heston (1991) data set.

Can the US economy grow at the same rate as Singapore or Japan? And why do so many countries fail to develop? These are some of the questions that growth theory tries to answer.

In the rest of this paper I will try to summarize what the current state of knowledge is, and the tentative policy advice that this knowledge suggests.

2. The Engines of Growth

The increase in the level of US income between 1870 and 1990 reflects the large volume of investment that took place during this period of time. Investment can take many forms: acquisition of new machines, building of new infrastructures, devoting time to learning how to perform a task or how to operate a new piece of equipment, trying to develop a new product, etc. Traditional growth theory, which built on the neoclassical growth model developed in the 1960's by, among others, Nobel laureate Robert Solow, emphasized the role played by the accumulation of physical capital. Clearly the level of physical capital in the US. is much larger today than in 1870. The US has now more buildings, more machines and more infrastructure equipment than in the 19th century.

But the accumulation of physical capital is only one part of the story. The most striking difference between most contemporary economies and those of a century ago, is that today we have much better goods and technologies. We have better buildings and infrastructure and faster, more efficient machines that produce more desirable products. All this is due to technological progress. Investment in research and development (R&D), which Solow's neoclassical model treated as being exogenous, has been the focus of the recent theoretical work.

The first wave of new growth models stemmed from Paul Romer's (1983,1986) thesis at the University of Chicago. Romer set out to explore the conditions under which sustainable growth is feasible when there are no exogenous increases in productivity. He, thus, focused on the most important drawback of the models 50's and 60's: their inability to explain sustained growth without assuming exogenous increases in productivity (often labeled "exogenous technical progress").

Romer's work was influenced by two observations: (i) the growth rate in the developed world shows no signs of a decline; and (ii) sustained growth is only feasible when there are no decreasing returns to capital accumulation (if new investment brings down the real rate of return, unceasing growth is not feasible). This led him to propose a model in which there were no diminishing returns to capital because of externalities associated with capital accumulation. These externalities meant that the productivity of an individual firm is higher the higher the aggregate stock of capital.

Work on the link between externalities of the form proposed by Romer and growth continues to attract interest (Caballero and Lyons (1992), Benhabib and Jovanovic (1991)).[i] However, it became clear at a theoretical level that externalities were not essential for sustainable growth (Jones and Manuelli (1990), Rebelo (1991)) and that probing deeper into the essence of technological progress would require more sophisticated models.

Romer also pioneered the second wave of work on growth models by proposing in 1990 a model in which private firms invested in R&D so they could create new goods that increased the efficiency of the production process. This model dealt with the fact that private firms will only invest in R&D if there exist patents and other form of property rights protection that allow them to appropriate the rewards to its innovation process. These patent systems create, however, a temporary monopoly by restricting the number of users of the technology. From a short run perspective these monopoly situations are undesirable. Once a given firm invents a new drug, a new software program or a better synthetic material it would be better to allow other firms to compete in the production of the new product. But this would eliminate any incentives for the private sector to engage in R&D. The monopolistic nature of markets for new goods is necessary so that R&D investment takes place.

Aghion and Howitt (1992) and Grossman and Helpman (1991) studied the "creative destruction" dimension of R&D investment. New, more desirable products displace the demand for older products, forcing firms with outdated technology to fail. There is, thus, a close link between technological progress, the dynamics of firm creation and firm destruction, and the behavior of unemployment. Jobs may be less secure, spells of unemployment more frequent and opportunities for older workers more scarce in an economy with fast technological progress. This link between growth and business cycles was first discussed in the writings of the German economist Joseph Schumpeter in the

1930's, but it was only the last few years that these ideas have been incorporated in complete, coherent models that can be used as laboratories to study the effects of public policies (see e.g. Aghion and Howitt (1991)).

Another important form of investment that has gained recent recognition in the work of Robert Lucas (1988) is the accumulation of human capital. Developed economies invest heavily in their education system. The average individual devotes much more time to formal schooling than his father and his grandfather did. High levels of education interact with technological progress at least at two levels. First, highly skilled individuals, who underwent long periods of formal schooling, are responsible for the vast majority of innovations. Inventions such as the radar and the transistor involved trained technical staff working in research laboratories. Second, the effective use of new technologies often require high levels of human capital. A powerful workstation in the hands of someone not familiar with its operating system is less useful than a small calculator.[ii]

The available empirical evidence (Psacharopoulos (1985)) suggests that there are high rates of return to primary and secondary education. These basic education levels involve moderate investments and build skills that are essential for a successful diffusion of technical progress. There is also evidence (Bartel and Lichtenberg (1987)) that skilled workers are essential in setting up new plants and in the process of learning by doing by which a new plant raises its productivity. As a consequence the ratio of skilled to skilled workers is higher for newer plants.

Formal schooling is not the only source of human capital accumulation. Arrow (1962), Stokey (1988), and Young (1991) have stressed the role of other forms of skill improvement, such as "learning-by-doing" and on-the-job-training. The incentive for firms and workers to engage in this type of training depends heavily on the structure of the labor market. In Japan, where worker turnover rates are low because of the high benefits associated with tenure at a firm, on-the-job-training plays a much more prominent role than in the US (Lynch (1993)).

The high wage rates enjoyed by developed countries reflect two factors: (i) the existence of a large stock of high-technology capital goods that make the productivity of labor high; and (ii) the investment by workers of time and resources to learning how to operate those technologies.

Recognizing that there are three engines responsible for economic development--technological progress, human capital accumulation, and physical capital investment--does not answer the question of why some countries fail to growth.[iii] What inhibits these factors from operating?

3. The Role of Public Policy

The most obvious potential source of cross-country growth differentials is public policy. Different economies choose different tax systems, financial intermediation regulations, trade policy, industrial organization policy, monetary policy, property rights protection, etc. Table 2, extracted from Easterly et al (1993), provides some empirical support to the link between policy and growth. This table, which identifies the variables that are statistically different when we compare fast-growing and slow-growing countries, was constructed using an augmented version of the Summers and Heston (1991) data set.[iv] This data set has played a critical role in the wealth of empirical work accumulated over the past decade.[v]

3.1 The Importance of Investment

The first three variables in Table 2 reflect the importance of overall investment and of resources devoted to education. Fast-growing economies devote higher shares of GDP to investment purposes and feature higher rates of enrollment in primary and secondary education.[vi]

The work of Alwyn Young (1994, 1992) has recently clarified the role played by high levels of investment in the growth process. A standard explanation for the extraordinary rates of growth obtained by East Asia's "Newly Industrialized Countries" (Hong Kong, Singapore, South Korea and Taiwan), is that these countries have experienced extraordinary productivity growth. This growth in productivity has often been attributed to clever public policy that has directed public and private investment to promising sectors of activity.

Young shows that manufacturing productivity growth in the NIC's is low. It ranges from -1.0% in Singapore to 2.7% in South Korea. High growth rates have not been the result of extraordinary productivity growth but of very high rates of investment. Investment as a share of GDP has been, in the last 20 years, about 30% for Hong Kong and South Korea, 25% in Taiwan and 40% in Singapore. These countries also invested heavily in education. The fraction of the working population that has completed secondary education has increased between 1966 and 1990 by three fold in Hong Kong and South Korea, by 2.5 fold in Taiwan and by four fold in Singapore.

TABLE 2

	Fastgrowers	Slowgrowers
Share of Investment in GDP	27%	17%
Secondary School Enrollment Rates	27%	7%
Primary School Enrollment Rates	90%	52%
Government Expenditures/GDP	14%	13%
Government Consumption/GDP	8%	12%
Inflation Rate	8.4	16.5
Standard Deviation of Inflation	8.8	19.4
Black Market Exchange Rate Premium	4.7	75.0
Standard Deviation of Black Market Premium	6.5	105.7
Share of Exports in GDP	44%	29%

Source: Easterly et al (1994).

The idea that high levels of investment explain most of the growth miracles in East Asia also finds support in the work of De Long and Summers (1991) and Jones (1991). These papers document the presence of a strong nexus between equipment investment and growth. Their regressions suggest that the high rates of expansion in East Asia do not reflect the effectiveness of industrial organization policy. They are simply the result of high levels of investment in general, and of high levels of equipment investment in particular.

The high levels of investment in countries such as the NIC's have been financed mainly by domestic savings. The high savings rates observed in these economies have often been attributed to cultural factors. However, in a recent study Carroll, Rhee and Rhee (1994) have found that the savings behavior of immigrants into Canada is independent of their ethnic origin. At the same time these authors have found that immigrants from Asia spend more on education than other immigrants.

High investment in physical capital and in education must partly reflect the influence of policies that encourage investment. Table 2 shows that fast growing countries have slightly higher levels of government expenditures but significantly lower levels of government consumption (which Barro (1991) has used as a proxy for wasteful government activity).

3.2 Inflation

Stanley Fischer (1993) studied the relation between high and variable rates of inflation and poor growth performance. Inflation has obvious negative effects on growth by raising the amount of time and resources used to economize on money holdings. But these direct effects of inflation are likely to be small. After all, the private sector can adapt to inflation by using indexation systems and by transacting in foreign currencies. Fischer (1993) stresses that high inflation is, most likely, a symptom of general uncertainty about public policy that inhibits investment. The negative association between the variability of the black market exchange rate premium and growth performance is also consistent with the well-established theoretical prediction that policy variability is detrimental to growth.

3.3 Trade Policy

Successful countries have been much more open to trade than stagnant economies. Import substitution strategies have not paid off. A large body of theoretical literature, which includes the work of Grossman and Helpman (1991) and of Rivera-Batiz and Romer (1991), has explored this connection between trade openness and growth.[vii] Open economies tend to absorb better the new technologies that are essential to sustainable growth for two reasons: (i) they are forced to compete with the world's most advanced countries so they cannot follow the strategy of selling shoddy goods to domestically.protected markets; and (ii) they can more easily adopt and develop new goods and technologies by being constantly exposed to state-of-the-art products.

At a world-wide level, international trade provides incentives for countries to pursue different R&D avenues, thus avoiding the costly duplication of research efforts that tends to take place when economies are isolated (think about how much resources

were wasted in the duplication of research effort between Western economies and the former Soviet block).

Romer (1994) has shown that the welfare cost of tariffs and other barriers to trade may be much higher than has been suggested by traditional trade analyzes which take the number of goods existent in an economy as fixed. The welfare cost of impediments to trade becomes much higher, when we take into account their negative impact on the number of different goods available in the economy.

A free trade policy is desirable, even in cases where the protection of certain "infant industries" can be given a theoretical justification (e.g., Krugman (1987)). In practice the mechanisms used to grant protection are likely to be manipulated by influence groups in their favor, and lead to the adoption of welfare-reducing forms of protection.

3.4 Financial Intermediation

King and Levine (1993) have found that measures of the size of the financial intermediation system (which were not included in the construction of Table 2) are correlated with high growth rates. These authors found empirical evidence that accords with the predictions of a battery of theoretical models reviewed in Greenwood and Smith (1993). These models emphasize the well-known role of the financial markets in allocating capital to its most efficient use. But they also show that financial markets perform less obvious growth enhancing functions: they foster the specialization that is essential to growth and allow agents to pool risk, making them more willing to invest in the development of new technologies.

This combination of theory and evidence suggesting that financial intermediation is beneficial to growth has severely reduced the number of adherents to Joan Robinson's view that finance is a parasitic activity, crystallized in her famous phrase "where enterprise leads, finance follows".

3.5 Infrastructure Investment

There is a strong relation between fraction of GDP devoted to infrastructure and the rate of growth. The importance of infrastructure investment for productivity and

growth, first examined in the work of Aschauer (1985), has been the focus of a large literature. Easterly and Rebelo (1993) have found a strong, robust association of between growth and public investment in transport and communication in panel data regressions. It is difficult to discern at the macroeconomic level whether infrastructure investment causes growth or whether investment in infrastructure is simply procyclical. Some microeconomic data agrees, however, with theories that view infrastructure investment as an important precondition to growth (Barro (1990)): ex post private real rates of return on transport and communication investment financed by the World Bank are higher than for other types of investments (Bandyopadhyay and Devajaran (1993)).

3.6 A Growth Recipe

Table 2 suggests that we might be able to isolate the effect of each policy on growth to create a "growth recipe". This is not the case for two reasons.

The first, stressed by Levine and Renelt (1992), is that governments that adopt good policies along one dimension also tend to adopt good policies along other dimensions, thus making the effects of an individual policy difficult to isolate. Countries that adopt good trade policy also tend to follow good policies towards financial intermediation , taxation, education, etc. In contrast, countries that adopt a particular policy discouraging investment and growth are likely to adopt other growth hampering policies. High taxes, hefty bureaucratic obstacles to economic activity, and poor protection of property rights tend to hinder the adoption of new technologies that enhance productivity. As the domestic industry looses its competitiveness, it becomes difficult for the government to resist subsidization schemes and projectionist measures, such as tariffs and quotas or dual exchange rates. Subsidizing and protecting inefficient industries often leads to high public deficits and to high rates of inflation.

The second impediment to creating a growth recipe is that there is a wide range of policies, such as taxation, tariffs and property rights protection, that we suspect are important in the growth process but which are difficult to measure empirically.[viii] As new data becomes available we might be able to make more progress in uncovering policies that are empirically correlated with good growth performance.

3.7 The Political Process

The "creative destruction" theories of Aghion and Howitt and of Grossman and Helpman make clear that not everyone is necessarily a winner in growth process. Owners of old firms, workers whose skills are specific to old technologies (watchmakers, type-setters, etc.) tend to lose in the presence of technical progress. Many economists suspect that countries that have been successful are those that have created institutional arrangements that compensated the losers and thus allowed growth to continue. In contrast, stagnant countries may have been those in which institutional arrangements have favored the protection of the status quo. These countries often see technological progress a threat to which they need to respond by using protectionist measures, regulation, and other forms of government intervention.

It is a difficult task to explain why different countries adopt different institutional arrangements. But here too there has been progress in the last few years. Work by Persson and Tabellini (1994), Alesina and Rodrick (1991) and many others have begun to explore the influence of income inequality on the policies adopted by different countries. Persson and Tabellini's theoretical work predicts that democracies with high inequality adopt aggressive tax policies to redistribute income toward the poor. These policies reduce the private incentives to invest, thereby hampering the growth process. Persson and Tabellini find empirical support for their prediction that democracies with initially low income inequalities tend to grow faster than economies featuring high income inequality and serious distributional conflicts.

The importance of distribution of income in shaping public policy regarding human capital accumulation has also been the subject of recent research. Saint-Paul and Verdier (1992) provide an explanation for why the extension of political rights to the poor implemented in most democracies, has not led to a slowdown in growth through the mechanism highlighted by Persson and Tabellini (1994). In Saint-Paul and Verdier's model redistribution can enhance the growth process when it takes place through the public provision of education, which tends to foster human capital accumulation and growth.

4. Luck and Poverty Traps

Some economists think that public policy cannot be blamed for all the development gaps we see around the world. Easterly et al (1993) investigate the possibility of luck playing a role in generating different growth performances. Suppose that all countries invest in configurations of industries that, from an ex-ante perspective, yield the same real rate of return. We will find, ex-post, that some countries did better than average while others did worse than average, even though their investment prospects looked equally promising to start with. Easterly et al (1993) find support for the presence of this type of randomness in the fact policies are highly correlated across different periods of time, while growth rates display very low correlation. This suggests that countries that followed similar policies in different periods may have obtained very different growth performances.

Another reason to believe that there are other factors besides policy affecting the course of development is that the number of countries with stagnant economies is extremely high. Easterly (1994) reports that 46 out of 87 developing countries have rates of growth that are not statistically different from zero. Can policy differences alone, explain why so many countries are stagnant?

Growth theorists have recently explored the possible existence of "poverty traps", which is an idea that was popular in the development literature of the 50's and 60's (e.g. Nelson (1956)). A poverty trap can arise when development prospects depend on the initial stocks of physical and human capital, and on the level of technological sophistication.

Azariadis and Drazen (1990) explore a simple but appealing form of poverty trap, for which they find empirical support. They stress that human capital may be difficult to accumulate in economies with an initially small stock of human capital. Countries with low literacy rates, in particular, often find it very costly to increase their stock of human capital. This implies that investment in human capital is often scarce. Each generation starts out with a low level of human capital and makes few investments in raising the level of skills of their children, thereby perpetuating the low skill nature of the labor force.

The English economist Thomas Malthus is famous for his prediction that steady population growth eventually leads to a reduction in the level of per capita income. Malthus' predictions have been regarded as fallacious in view of the sustained growth experienced by many economies in the post-war period. However, recent work by Becker, Murphy and Tamura (1990) suggests that Malthusian forces might underlie the stagnation of many LDC's.

Building on the work by Barro and Becker (1988) on endogenous population growth, these authors uncovered a different poverty trap that results from the interaction between fertility and capital accumulation decisions. They show that parents with a low level of education tend to have a large number of children to whom they provide low education levels. In contrast, parents with high human capital generally choose to have a small number of children to whom they provide a high level of education. At an economy-wide level these joint decisions about human capital acquisition and fertility may create a poverty trap. Countries where the level of human capital is low will tend to have high fertility rates and to invest little in education, thus remain in a Malthusian poverty trap.

In recent work Ciccone (1993) has explored yet a different poverty trap mechanism.. In his model specialized human capital is complementary to specialized capital goods. A poverty trap can arise because of a coordination failure: new capital goods may not be developed because of lack of skilled workers to use them; at the same time workers may choose not to become skilled because they fear that the capital goods necessary to make their skilled valuable will not be introduced in the economy.

5. Do levels of income converge in the long run?

One central prediction of the neoclassical growth model is that income levels should converge in the long run. Underneath this convergence prediction is the assumption that there are diminishing returns to capital--the real rate of return to capital is high in economies in which capital is scarce and low where capital is abundant.

The mechanics of convergence are quite simple. Imagine that a war destroys part of the capital stock of an economy. When peace resumes, capital will be scarce and command high returns. High returns to capital encourage investment that increases the

growth rate of the economy. This means that the economy will grow faster than it did before the war, and that in the long run it will converge to the same level of income it would have enjoyed if the war had not taken place.

FIGURE 2

Convergence Predictions, Neoclassical Growth Model

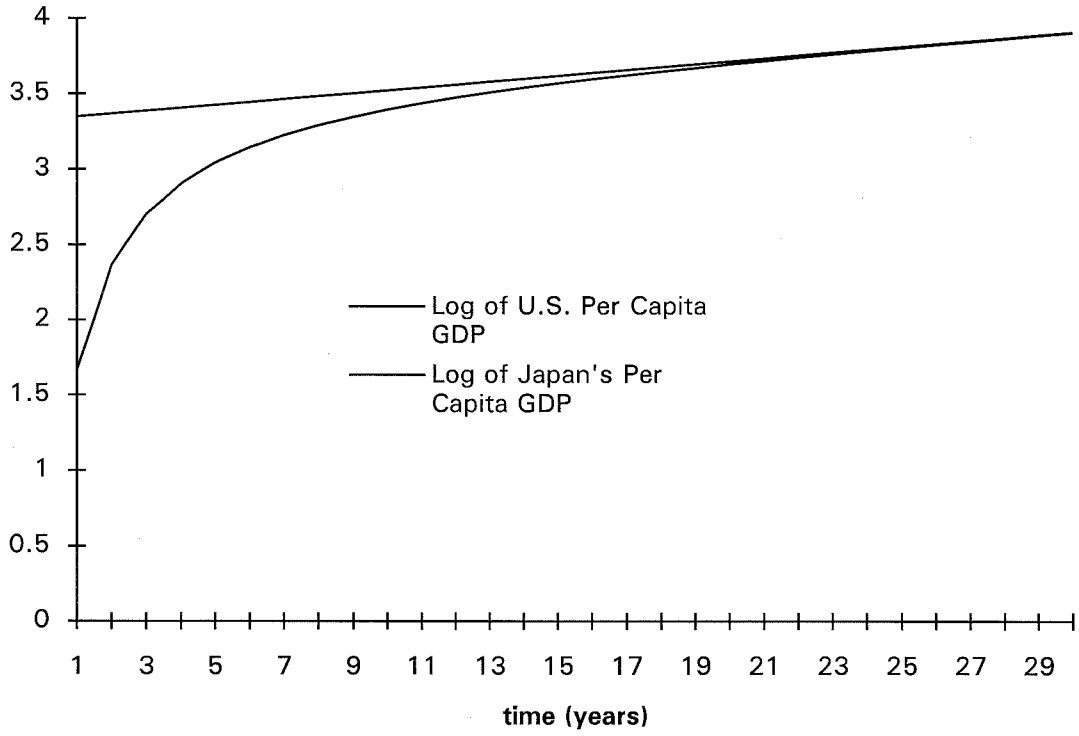
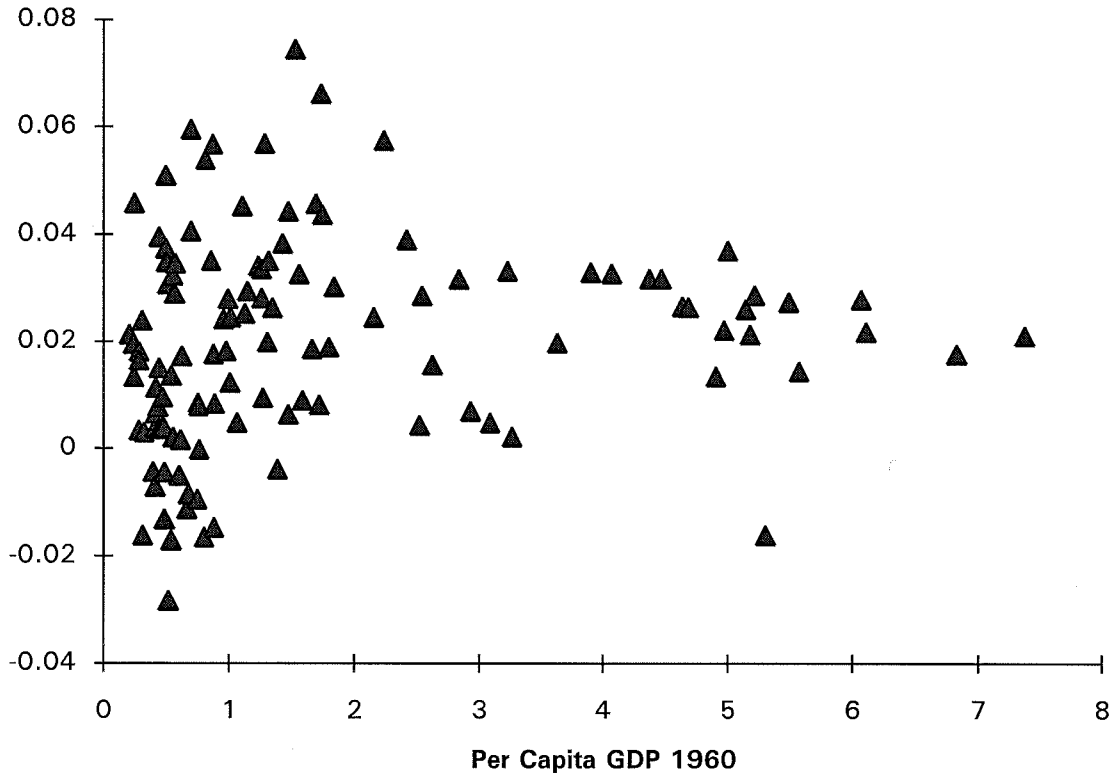


Figure 2, extracted from King and Rebelo (1993), shows the predictions of the neoclassical model for Japanese growth after World War II. Notice that Japan grows faster than the US and eventually catches up to the US income level.

FIGURE 3

Growth Rate of Per Capita GDP, 1960-1985



These convergence dynamics mean that since in poor countries the stock of physical capital is low, their economies should display high real rates of return to investment and high rates of growth. Figure 3, which plots the growth rate of GDP for the period 1960-1985 against the initial level of income for a cross-section of countries from the Summers and Heston (1991) data set, shows that this convergence prediction is not borne out by the data. Poor countries do not tend to grow faster than rich countries. The correlation between growth and the initial level of income is not positive but not statistically different from zero. Furthermore, there is no evidence that real rates of returns are high in poor economies.

This failure of a central prediction of the neoclassical growth model was one of the motivations for the development of new growth models. But in a series of papers Robert Barro and Xavier Sala-i-Martin (1992), have revived the idea of convergence. They showed that convergence has occurred among the different US states and among regions of Europe, in the sense that the dispersion of income across these regions has declined over time. They also found that some convergence has taken place among OECD countries. The rate of convergence among US states and among OECD countries is 2% per annum. What this means is that every year each country completes 2% of the difference between its current income level and its long run income path. This rate of convergence is very slow. It means, for instance, that East Germany will take 35 years to close half of the gap between its current income level and that of West Germany.

Barro and Sala-i-Martin (1992) and Mankiw, Romer and Weil (1992) also argue that underneath Figure 3 one can find a more subtle notion of convergence that Barro named "conditional convergence". Since countries are different along many dimensions one would not expect them to converge to the same long run path. Most likely, each country is converging to its own growth path. This means that there is convergence in growth rates but not in levels of income. If a country sees it capital stock destroyed it will grow faster and eventually catch up with the path that it was following before the shock took place. This long term path does not, however, have to be the same for all countries. Barro argues that there is evidence of this form of convergence and that, surprisingly, the rate of conditional convergence is also 2% per year.

While much of the work on convergence has used the neoclassical growth model as its point of departure, there are other forces omitted in this model that can lead to convergence. Two obvious ones are migration and technological diffusion.

Workers tend to migrate from low wage countries to economies where the wage rate is high. This increases the capital-labor ratio in their home country at the same time it lowers the capital-labor ratio in the economy to which they migrate, thus reducing factor intensity differences in the two economies.

Poor countries can also raise their standard of living by adopting technologies that have been created elsewhere. This "catching up" effect must have played an important role in the Asian growth miracles. As these countries approach the technology frontier, it will become more difficult to sustain high rates growth.

The evidence supporting the convergence hypothesis is surprising. However, it is also clear that a convergence rate of 2% per annum is a very weak force that leaves unexplained most of the cross-country diversity in growth experiences.

6. Conclusion

The growth theories developed in the 50's and 60's treated as exogenous the only factors responsible for long-run growth in aggregate income: population growth and technological progress. As a consequence, policies that distorted the returns to accumulation could lead to a temporary slowdown but did not affect long-term growth prospects.

In contrast, recent work on growth theory emphasizes repeatedly the idea that any factors reducing the rewards to investment by the private sector will permanently slow down the rate of economic expansion. There are abundant examples of this type of factors: high taxes, bureaucratic red tape, obstacles to financial intermediation, corruption, barriers to trade, inefficient education systems, lax patent protection, poor protection of general property rights, political instability, etc.

This list of policy variables might suggest that it is possible to trace all differences in growth experiences to differences in public policy. It is, however, likely that initial conditions, such as the stock of physical and human capital and the state of economic development, might play a role in determining the prospects for economic development. Some configurations of initial conditions, namely ones with very low levels of human capital, might lead the economy to remain in a "poverty trap".

Other configurations of initial conditions, namely ones with low levels of physical capital, may be associated with high rates of return and high rates of growth. The recent literature has revived the idea that poor countries should--everything else equal--grow at faster rates than rich countries. This tendency toward convergence is, however, weak and can easily be overwhelmed by other factors.

There are also random factors affecting growth performance. Some countries might have invested in industries that looked promising but ended up yielding low rates of return, while others were lucky in their choice of sectoral investment.

The recent literature has taken seriously the idea that policy is neither exogenous nor chosen by a benevolent dictator. Policies are always shaped by interest groups and political forces. The institutional factors that condition the interaction between political actors can be of primary importance in the development process. In the next decade, we hope to learn more about the link between institutions, policy and growth.

Technological innovation has created blueprints for numerous goods that have generated an unprecedented increase in standards of living. Economists and political scientists have now the opportunity of creating the blueprints for new institutional arrangements that can spread the beneficial aspects of technical progress around the world.

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[i]A recent assessment of the empirical evidence on externalities in the US manufacturing sector is provided by Burnside (1996).

[ii]Kleenow (1995) discusses the limitations of growth models that rely on human capital as their sole engine of growth. He argues that measures of human capital cannot explain the differences in total factor productivity in a panel of U.S. industries. Technological differences, not differences in human capital, seem to be the essential determinant of industrial productivity.

[iii]An abundance of natural resources is often thought to have played an important role in US. economic development. However, Sachs and Warner (1995) show that, in the 1970-89 period, resource-poor economies outperform resource-rich ones. They rationalize this finding as being an implication of the Dutch disease. Economies rich in natural resources will tend to have a larger share of non-tradables production, which are mostly concentrated in the service sector, and a correspondingly smaller manufacturing sector. To the extent that services productivity grows less rapidly than manufacturing productivity, this may cause the economy to grow at a slower pace.

[iv]Fast-growing countries were defined as being those whose growth rates exceed the cross-country average plus one standard deviation. Slow-growing countries are those whose growth rates are below the average minus one standard deviation.

[v]This data set corrects the national income accounts of a large sample of countries for deviations relative to "purchasing power parity". When we translate the per capital income of India into dollars using the exchange rate, we are implicitly assuming that "purchasing power parity" holds. That is, we are assuming that the prices of all goods is the same in India and in the US. This assumption is grossly counterfactual, thus making it difficult to compare real incomes across countries. The Summers and Heston (1991) data set uses information on prices in several countries to surpass this problem.

[vi]The data set employed to construct this table did not include information on R&D expenditure or on technology adoption.

[vii]Grossman and Helpman (1991) revisit many of the themes of trade theory in a dynamic context that highlights the role of technical progress. In particular they study the forces that determine a country's comparative advantage.

[viii]Evidence on the relation between these policies and growth is provided by Easterly and Rebelo (1993) and Knack and Keefer (1994).