The Future of Economic Convergence

Dani Rodrik

I. Introduction

Novelists have a better track record than economists at foretelling the future. Consider then Gary Shteyngart's timely comic novel Super Sad True Love Story (Random House 2010), which provides a rather graphic vision of what lies in store for the world economy. The novel takes place in the near future and is set against the backdrop of a United States that lies in economic and political ruin. The country's bankrupt economy is ruled with a firm hand by the IMF from its new Parthenon-shaped headquarters in Singapore. China and sovereign wealth funds have parceled America's most desirable real estate among themselves. Poor people are designated as LNWI ("low net worth individuals") and are being pushed into ghettoes. Even skilled Americans are desperate to acquire residency status in foreign lands. (A degree in econometrics helps a lot, as it turns out) Ivy League colleges have adopted the names of their Asian partners and yuan-backed dollars are the only safe currency.

This is sheer fantasy of course, but one that seems to resonate well with the collective mood. A future in which the United States and other advanced economies are forced to play second fiddle to the dynamic emerging economies in Asia and elsewhere is rapidly becoming

cliché. This vision is based, in part, on the very rapid pace of economic growth that emerging and developing economies experienced in the run-up to the global financial crisis of 2008-09. For once, it wasn't just China and the usual Asian Tigers that grew by leaps and bounds. Latin America benefited from a pace of economic development that it had not experienced since the 1970s, and Africa began to close the gap with the advanced countries for the first time since countries in the continent received their independence. Even though most of these countries were hit badly by the crisis, their recovery has also been swift. By 2010, developing countries (including the former socialist economies) had grown to constitute half of the world economy, and were responsible for the bulk of global growth. Discussion about the developing world's prospects extended beyond"BRIC" (Brazil, Russia, India, China) to China's global economic dominance (Subramanian, 2011), "the next convergence," (Spence 2011), Global Growth Generators (Citigroup 2011), and the new African middle class (African Development Bank 2011).

Optimism on developing countries is matched by pessimism on the rich-country front. The United States and Europe have emerged from the crisis with debilitating challenges. They need to address a crushing debt burden and its unpleasant implications for fiscal and monetary policy. They also need to replace growth models that, in many instances, were based on finance, real estate, and unsustainable levels of borrowing. Japan has long ceased to exhibit any growth dynamism. And the euro zone's future remains highly uncertain—with the economic and political ramifications of its unraveling looking nothing less than scary. In such an environment, rapid growth in the developing world is the only thing that could propel the world economy forward and generate increasing demand for rich-country goods and services—the only silver lining in an otherwise dreary future. Provided, that is, one doesn't take Shteyngart-type nightmare scenarios too seriously.

The question I address in this paper is whether this gap in performance between the developed and developing worlds can continue, and in particular, whether developing nations can sustain the rapid growth they have experienced of late. I will not have anything to say

on the prospects for the advanced economies themselves, assuming, along with conventional wisdom, that their growth will remain sluggish at best. My focus is squarely on the developing and emerging countries and on the likelihood of continued convergence.

My first point is that growth in the developing world should depend not on growth in the advanced economies themselves, but on the difference in the productivity levels of the two groups of countries—in other words, on the "convergence gap." The rate at which lagging economies catch up is determined by their ability to absorb ideas and knowledge from the technology frontier. This frontier doesn't recede simply because the countries that have developed the technology are growing at a slower pace. Moreover, as I will show below, the developing countries' convergence gap stands as wide today as in 1950 (even though it has closed somewhat over the last decade). Consequently, their potential growth rate is as high as it has ever been since the end of the Second World War.

Yet I find much of the optimism regarding the prospects for rapid convergence misplaced. In practice most of the convergence potential is likely to go to waste—just as it has since the world economy first got divided into a rich North and a poor South. As the empirical literature on growth has documented, convergence is anything but automatic. It is conditional on specific policies and institutional arrangements that have proved hard to identify and implement. Indeed, the recipes seem to vary from context to context. The experience of highly successful Asian countries is difficult to transplant in other settings.

It is true that the policy and institutional setting has improved across the developing world—at least as judged by conventional criteria. Developing countries have opened up to the world economy, place greater emphasis on macroeconomic stability, and are for the most part better governed. These changes have led many observers to think "this time will be different." My reading of the evidence is that these are improvements that serve mainly to enhance these economies' resilience to shocks and help avert crises, which often interrupted economic progress in the past. They do not necessarily stimulate ongoing economic dynamism and growth.

Sustained growth, of the type that a handful of countries in Asia have managed to generate, requires something on top of—and sometimes in lieu of—conventional macroeconomic and openness policies. It requires active policies that promote economic diversification and foster structural change from low-productivity activities (such as traditional agriculture and informality) to mostly tradable higher-productivity activities. It requires pulling the economy's resources into those sectors that are on the automatic escalator up. A striking (and new) stylized fact that I describe in the paper is that there is indeed *unconditional* convergence in individual manufacturing industries. Once an economy gets to produce electric generators, or, say motor vehicles, labor productivity in that industry is placed on an automatic upward trajectory. The trajectory is steeper the lower the starting point. The trick is to get a toehold in these automatic-convergence industries and to expand domestic employment in them.

The requisite structural transformation is rarely the product of unassisted market forces. It is typically the result of messy and unconventional interventions that range from public investment to subsidized credit, from domestic-content requirements to undervalued currencies. Such policies are difficult to manage both for informational reasons—how do we know where and how to intervene?—and for political reasons—how do we prevent them from being captured by powerful rent-seekers?

In addition, low growth in the rich countries creates a difficult external environment for the conduct of structural transformation policies in developing economies. Policymakers in the United States and Europe have long stopped viewing subsidies and overvalued currencies in developing nations with benign neglect. With unemployment stuck at high levels and the economy stagnating, such policies are likely to attract even more vociferous opposition. Greater pushback from the IMF and the WTO on industrial policies and "currency manipulation" is to be expected.

Sustained convergence will continue to be a challenge in this environment, no less so than in previous periods. Economic performance will likely remain heterogeneous. Some countries will have the ability to stimulate structural change and diversification, but many others

will fail for domestic or external reasons. Some of those that have done well in the past will run into new constraints they will find harder to overcome. China, especially, may find itself in this category, as I will suggest at the end of the paper. Countries that are further away from the productivity frontier may find it easier to grow for a while than others who have already pulled closer.

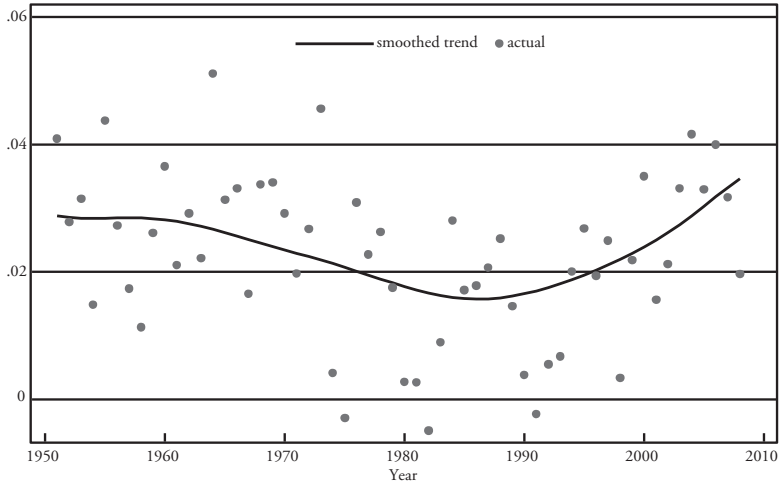
So, generalized, rapid convergence is possible in principle, but unlikely in practice. Our baseline scenario has to be one in which high growth remains episodic. Sustained convergence is likely to remain restricted to a relatively small number of countries.

II. A Very Special Decade

The world economy experienced very rapid growth in the decade before the global financial crisis. In fact, once we smooth out the annual variations, growth reached levels that were even higher than those in the immediate aftermath of World War II (Chart 1), which is remarkable in view of the fact that growth in the early 1950s was boosted by reconstruction and recovery from the war. The growth pattern of the world economy since 1950 looks U-shaped: a downward trend from about 1960 until the late 1980s, followed by a strong recovery since then.

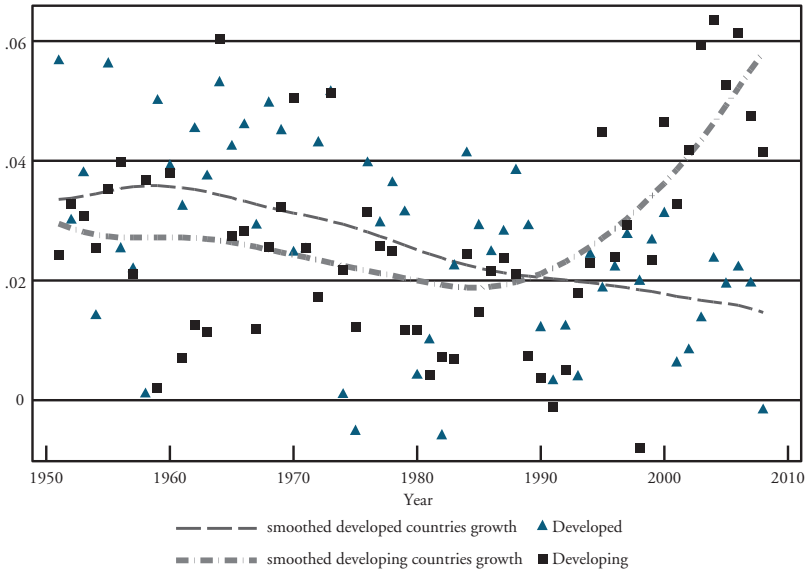
What this trend hides, however, is the divergent performance of developed and developing countries. As Chart 2 shows, developed countries have experienced a steady decline in growth since the 1960s, from around 3.5 percent per annum in per capita terms during the 1950s to below 2 percent in the early years of the new millennium. The recent recovery in global growth is due entirely to a remarkable improvement in the performance of the developing parts of the world. Growth in developing countries nearly tripled from around 2 percent per capita in the 1980s to almost 6 percent before the crisis of 2008. It is China (and the rest of developing Asia) that accounts for the bulk of this performance. But high growth in East and Southeast Asia predates the new millennium, and what is especially noteworthy about the recent experience is that Latin America and Africa were, for once, part of the high-growth club. Growth picked up in both regions starting around 1990, and surpassed levels

Chart 1
Growth Trends in World Economy: GDP Per Capita Growth Rates, 1950-2008



Source: Author's calculation using data from Maddison (2010)

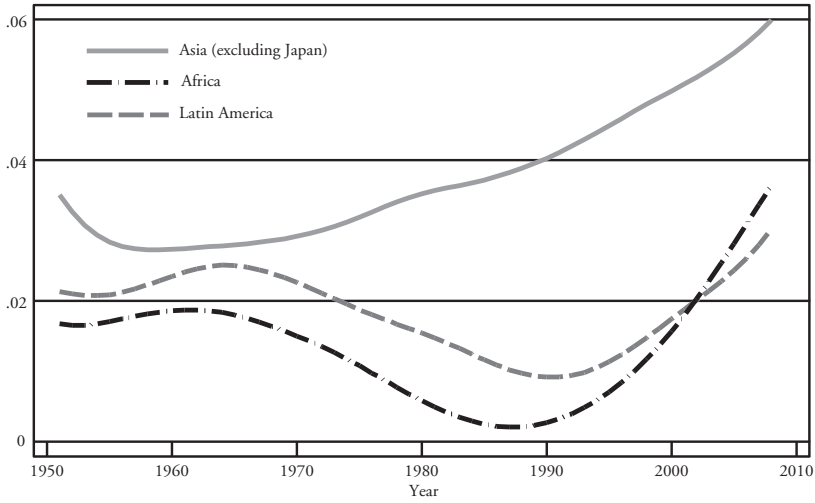
Chart 2
Growth Trends in Developed and Developing Countries, 1950-2008



Notes: The list of developed countries covers the United States, Canada, Western Europe, New Zealand, Australia, and Japan. Developing countries are the rest.

Source: Author's calculation using data from Maddison (2010)

Chart 3
Developing Country Growth Trend by Region, 1950-2008



Source: Author's calculation using data from Maddison (2010)

not experienced since the 1960s (Chart 3). As Arvind Subramanian (2011) has documented, growth in the developing world was both rapid and, for once, very broadly based.

As a result, for the first time ever in the postwar period, developing countries as a whole have been growing faster than the rich countries. Put differently, there is economic convergence. As Chart 2 shows, the gap between the growth rates of rich and poor nations has steadily widened, and stood at an astounding 4 percentage points in 2008.

Post-crisis prognostications that project rapid global growth on the back of emerging and developing countries' performance are largely extrapolations from this recent performance. Citigroup economists, for example, predict that per-capita incomes in the world economy will grow by 3.6 percent in 2010-2030 (very similar to the pre-crisis levels), even though each of the advanced regions of the world are projected to grow at below 2 percent (again, just as in the pre-2008 period) (Citigroup 2011, Figure 24). Subramanian estimates global growth at 3.4 percent over the same period, with emerging and developing countries growing at 4.6 percent (2011, Table 4.2). The accounting and consulting firm PwC (2011) projects China, India, and Nigeria to

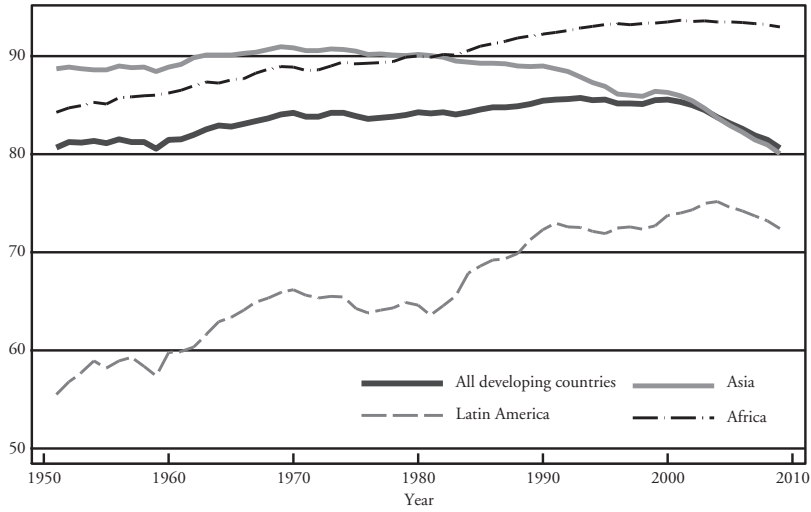
grow at rates exceeding 4.5 percent until 2050. (All these estimates are in PPP and per-capita terms.) Underlying all these approaches is the supposition that developing countries will sustain very rapid growth rates and economic convergence will continue unabated.

From the standpoint of economic theory, there is nothing wrong with this supposition. Developing countries do not need to develop from scratch technologies that are already available; they simply need to adapt and adopt them. Their investment in physical and human capital need not be constrained by domestic saving; they can borrow from global financial markets to finance their accumulation. Their production need not be limited to small domestic markets; they can access rich countries' much larger markets. Standard growth models therefore predict rapid catch-up for countries behind the technology frontier. Convergence ought to be the normal state of things.

The convergence potential of countries is typically measured by the income gap that separates them from rich countries. For developing countries as a group, this gap has steadily increased since the 1950s until 2000, and has precipitously dropped over the last decade, bringing it back to levels that prevailed in the early 1950s (Chart 4). Asia has been closing the gap steadily since the late 1970s, while Africa and Latin America have only recently experienced what appears to be, over a long time horizon, a comparatively small turn in the same direction. (The trend for developing countries as a whole is heavily influenced by the growing share of fast-growing China in the total.) The basic conclusion from Chart 4 is that the potential for catch-up growth remains huge, especially in Latin America and Africa where the convergence gap is wider than at any time since before the 1990s.

Yet the fact that widespread convergence is a relatively recent phenomenon should give us pause before we accept these points uncritically. Ever since the Industrial Revolution propelled Western Europe forward, most developing parts of the world have experienced divergence rather than convergence (Pritchett 1997). Rapid growth of the kind that the optimists expect has been very rarely sustained. Latin America has experienced periods of convergence that have proved short-lived, as in the 1970s (Chart 4).

Chart 4
Convergence Gaps by Region, 1950-2008
(Difference in Income Levels, as Percent of Developed Country Incomes)



Notes: The list of developed countries covers the United States, Canada, Western Europe, New Zealand, Australia, and Japan. Developing countries are the rest.

Source: Author's calculation using data from Maddison (2010)

A look at economic history is sobering. Table 1 shows the list of countries that have sustained per-capita growth exceeding 4.5 percent per annum over a period of three decades or more at any time since the early part of the 19th century. This is a short list, with a few features that stand out. First, such rapid and sustained growth almost never took place before 1945. The only exceptions are Australia and New Zealand in the 19th century and Venezuela (off the back of an oil boom) in the early decades of the 20th. Second, the post-1950 episodes come in three clusters. There are the countries in southern Europe and its periphery in the immediate aftermath of the Second World War (Italy, Spain, Portugal, Greece, Israel, and Yugoslavia). There are the oil boom countries (Saudi Arabia, Iraq, Libya, and Oman). And then there are the Tigers of East and Southeast Asia.

The first and third of these are classic convergence stories that would need to be replicated for rapid growth to be sustained. I will turn to some of the lessons from their experience later in the paper.

Table 1
Countries That Have Grown at 4.5 Per Annum Per Capita (or Faster) Over 30 Years or More

Country	Fastest growth rate achieved over three decades (%)	Period
Before 1900		
Australia	5.8	1823-1853
New Zealand	7.1	1840-1870
Between 1900 and 1950		
Venezuela	5.5	1907-1939
Since 1950		
Italy	5.9	1945-1975
Spain	4.9	1949-1980
Portugal	4.6	1950-1980
Greece	7.3	1945-1975
Israel	4.7	1953-1983
Yugoslavia	4.9	1952-1982
Iraq	5.3	1950-1980
Saudi Arabia	6.1	1950-1980
Libya	7.4	1950-1980
Oman	7.4	1950-1985
Japan	7.4	1945-1975
North Korea	4.7	1951-1981
Taiwan	7.2	1946-1976
South Korea	7.3	1965-1995
Singapore	6.7	1964-1995
Hong Kong	6.0	1958-1988
Malaysia	5.1	1967-1997
Indonesia	4.7	1967-1997
Burma	4.9	1977-2007
China	6.7	1976-2007
Botswana	7.3	1960-1991
Cape Verde	5.5	1977-2007
Equatorial Guinea	9.3	1974-2004
Ireland	4.6	1976-2006

Source: Author's calculations from Maddison (2010)

But it should be clear that the performance of the last decade covers a short period, and cannot be safely extrapolated.

III. Could This Time be Different?

Perhaps this time will be different. That is the view explicitly articulated, for example, by Willem Buiter and Ebrahim Rehbari (Citigroup 2011), who expect strong growth in developing and emerging market economies to continue:

> *For poor countries with large young populations, growing fast should be easy: open up, create some form of market economy, invest in human and physical capital, don't be unlucky and don't blow it. Catch-up and convergence should do the rest. (Citigroup 2011, p. 1)*

Buiter and Rehbari include Bangladesh, China, Egypt, India, Indonesia, Iraq, Mongolia, Nigeria, Philippines, Sri Lanka, and Vietnam in their list of "Global Growth Generators (3G)"—countries with the most promising growth prospects. Less dramatically but equally optimistically, Arvind Subramanian points to the Chinese and Indian experiences:

> *Few countries in economic history have grown as fast and for such a long time period, structurally transformed their economies to such an extent, and remained as politically and macroeconomically stable as China and India—and yet not become at least half as rich as the frontier country. Any precipitous slide in the fortunes of China and India cannot be ruled out, of course, but history is more on their side than against them. (Subramanian 2011, p. 67; footnote omitted)*

Unlike other countries (such as Venezuela and Brazil) whose high growth was interrupted by external or internal shocks, Subramanian argues that these countries are politically stable, follow prudent macroeconomic policies, and have become global powerhouses in tradables (manufacturing or services).

Both studies recognize that the historical record of convergence is patchy and that there have been too many false starts. But both also assert that recent growth is here to stay. Buiter and Rehbari argue that

there are occasionally what they call "game changers." They view the transition from socialism to market economies and from autarkic economic policies to the embrace of globalization in that light (Citigroup 2011, 29-30).

There are four planks to the growth optimists' argument, all relating to favorable changes in policies, institutions, or the external context. First, there has been significant improvement in the conduct of monetary and fiscal policies in the developing world. With rare exceptions, macroeconomic populism has gone out of fashion. Price stability and debt sustainability have become the norm rather than the exception. This is a key reason why the developing world did not suffer lasting damage from the global financial crisis: their macroeconomic and financial fundamentals were in generally good shape.

Second, again with few exceptions, developing countries have opened themselves up to international trade (and to capital flows). Even though tariff rates still tend to be higher in poor countries, they now average in the low teens rather than the 30-60 percent range as used to be the case. Indeed, developing nations are now more integrated to the global economy than at any time since the 19th century, when it was routine for European powers to impose openness on them through colonial rule or one-sided free trade treaties.

Third, developing nations are now generally much better governed. Most of Latin America is now ruled by democratically elected governments. In Africa, peace settlements have restored some semblance of stability to the conflict-ridden countries of Congo, Sudan, Sierra Leone, Liberia, Cote d'Ivoire (Ivory Coast), and elsewhere. In many cases, democracy has replaced dictatorship. The quality of institutions—which many economists believe is the ultimate determinant of long-term economic performance—has definitely improved, although the extent and durability of the improvement can be debated.

Finally, the globalization of markets and the spread of global production networks have created a more hospitable environment for economic catch-up, at least for countries with the necessary background conditions (so-called "fundamentals"). These allow for the faster spread of ideas and blueprints, and facilitate the plugging of

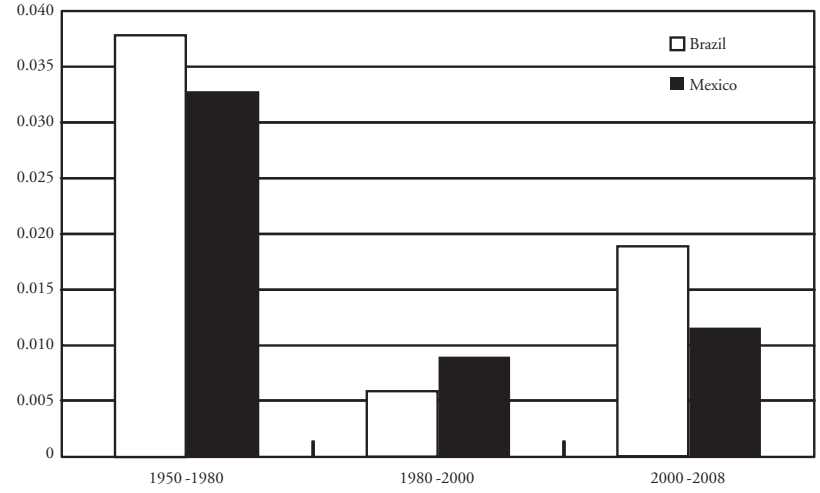
firms from poor countries into advanced technologies. As long as these firm-level productivity gains can be passed on to the rest of the domestic economy, growth can be both rapid and widely shared.

Prudent macroeconomic management, openness, and improved governance surely help avoid large policy mistakes and economic disasters. By eliminating the lower tail of growth outcomes, they raise the average performance. What is less clear is whether these policy improvements in the conventional sense are sufficient—or indeed even necessary—for promoting sustained economic growth. As recently as the mid-2000s, when Latin American growth still seemed disappointing, it was commonplace for economists to argue that macroeconomic and institutional reforms had not gone far enough. Growth was unimpressive, the story went, because the reforms were timid, limited in range, and lacked political commitment. "Meant Well, Tried Little, Failed Much" was the title of a speech that Anne Krueger gave in March 2004, on the reforms in emerging market economies (Krueger 2004, Rodrik 2006). Now that the growth picture looks brighter, there is evidently a tendency to portray those same reforms in a better light.

Countries with improved policies and institutions have been doing better of late, but it is equally true that many have yet to replicate their performance from previous eras. Brazil and Mexico, for example, are two countries that have become poster children for the new policy mindset in emerging markets. Yet these two have recently registered growth rates that are only a small fraction of what they had experienced during the three decades before 1980 (Chart 5). And note that this cannot be explained by growth having become harder over time: these two countries had larger convergence gaps in 2000 than they did in 1950.[1] As a share of developed-country incomes, their incomes shrank from 30 percent and 42 percent in 1950 (for Brazil and Mexico, respectively) to 24 percent and 32 percent in 2000.

Moreover, none of the Asian growth superstars, with the possible exception of Hong Kong, fit the standard paradigm neatly. China, India, and the East Asian cases are all instances of mixing the con-

Chart 5
Average Per-Capita Growth Rates of Brazil and Mexico, by Period



Source: Author's calculations from Maddison (2010)

ventional and the unconventional—of combining policy orthodoxy with unorthodoxy (Rodrik 2007, chapter 1).

China's policies on property rights, subsidies, finance, the exchange rate, and many other areas have so flagrantly departed from the conventional rule book that if the country were an economic basket case instead of the powerhouse that it has become, it would be almost as easy to account for it. After all, it is not evident that a dictatorship that refuses to even recognize private ownership (until recently), intervenes right and left to create new industries, subsidizes loss-making state enterprises with abandon, "manipulates" its currency, and is engaged in countless other policy sins would be responsible for history's most rapid convergence experience. One can make similar statements for Japan, South Korea, and Taiwan during their heyday, in view of the rampant government intervention that characterized their experience.

As for India, its half-hearted, messy liberalization is hardly the example that multilateral agencies ask other developing countries to emulate. Foreign economists advise India to speed up the pace of liberalization, open its financial system, rein in corruption, and pursue

privatization and structural reform with greater vigor. India's political system meanwhile dithers. Economists are prone to interpret the paralysis as lack of political leadership or worse. But often the hesitancy reflects genuine uncertainty—and differences of views—over how to achieve a better-functioning market economy in the Indian context, and to do so without social costs and upheavals.

There is a fundamental question that we bump up against in these debates: What determines convergence? The empirical literature on economic growth has established that convergence is not automatic. There is only conditional convergence, not unconditional convergence. But what are those conditioning circumstances?

There is a sense in which this question has an easy answer. Growth econometricians have identified a longish list of variables which, once they are controlled for (individually or collectively), permit the convergence gap to exert significant leverage on actual growth. The investment rate, educational attainment or schooling, the share of trade in GDP, financial deepening, and government consumption are some of the most common indicators on this list. The estimated coefficient on initial income typically turns negative and statistically significant as soon as we throw any combination of these variables on the right-hand side of a growth regression. The interpretation is that convergence requires high enough levels of investment, schooling, trade, and so on.

The trouble with such regressions is that they do not tell the policymaker what they are really after, which is the set of policies that guarantee convergence. Investment, schooling, or trade levels are not policy levers that one can directly set or adjust. They are the outcomes of many different things going on simultaneously, including external and exogenous circumstances as well as policies of unknown effectiveness and unclear direction of impact. It is hard to know, for example, the impact that import liberalization would have on the export-GDP ratio, or whether export subsidies and free trade zones would not be more effective at boosting it. When instead we condition convergence on policies directly under the control of governments—such as tax rates or tariff levels—we rarely get clear-cut or robust results.

Some years back Larry Summers gave a lecture in which he chided the skeptics who quibble about the determinants of convergence. "I would suggest," he said,

"that the rate at which countries grow is substantially determined by three things: their ability to integrate with the global economy through trade and investment; their capacity to maintain sustainable government finances and sound money; and their ability to put in place an institutional environment in which contracts can be enforced and property rights can be established. I would challenge anyone to identify a country that has done all three of these things and has not grown at a substantial rate" (Summers 2003).

But what appears at first sight to be a sweeping affirmation of the robustness of our knowledge about what countries need to do is on closer look an ingeniously crafted hedge which illustrates and reinforces my point about the extent of our actual ignorance.

Notice Summers' choice of words: "ability to integrate with the global economy," not low tariffs or capital-account convertibility; "capacity to maintain sustainable government finances and sound money," not any particular fiscal or monetary rule; "ability to put in place an institutional environment in which contracts can be enforced and property rights can be established," not any particular regime of private property rights and corporate governance. By resorting to the ability and capacity to achieve outcomes that are systematically correlated with growth instead of the actual policies that deliver those outcomes, Summers' statement ducks the hard questions. The "ability" to do X and "capacity" to manage Y do not tell us what the requisite policies are. The moment we try to give these directives operational content—by substituting, say, low tariffs for integration into the world economy—we run again into a familiar problem: Unorthodox Asians have generally done much better than orthodox Latin Americans, and many Latin Americans have done a whole lot better when they were unorthodox than when they turned orthodox.

What is probably the most comprehensive empirical analysis of the link between policies and growth was undertaken by Bill Easterly in a chapter for the Handbook of Economic Growth (Easterly 2005).

Easterly ran standard growth regressions using 5-year panels over the period 1960-2000. He included the following "policies" as independent variables on the right-hand side of the equation: inflation, budget deficits, black-market premia for foreign currency, overvaluation, M2/GDP, trade/GDP, and government consumption/GDP. (Note again that many of these are not, strictly speaking, policy variables.) In the baseline specification, most of the indicators enter with coefficients that have the expected sign and are statistically significant, either on their own or collectively. He then re-estimates the regression by removing observations with "extremely bad policies" (i.e., cases where inflation or the black market premium > 35%, overvaluation > 68%, budget deficits/GDP > 12%, M2/GDP > 100%, trade/GDP > 120%). He finds that policy variables no longer enter significantly, individually or collectively. Easterly's bottom line is that empirical evidence gives little reason to have confidence that moderate changes in policies will yield systematic or sizable growth effects. Another way of putting the same result is to repeat the point made above: avoiding truly awful policies can prevent a country from turning into an economic basket case, but "good" policies of the conventional type do not reliably generate high growth.

To return to the question of this section's title, perhaps this time will be different. But there is plenty of reason to think that we cannot rely on prudent macro policies, greater openness, and better governance on their own to do the trick. To get a better sense of the likelihood of sustained convergence we need to take a closer look at the mechanics of growth in developing countries, which is the task of the next section.

IV. The Convergence Engine: Structural Change and Diversification

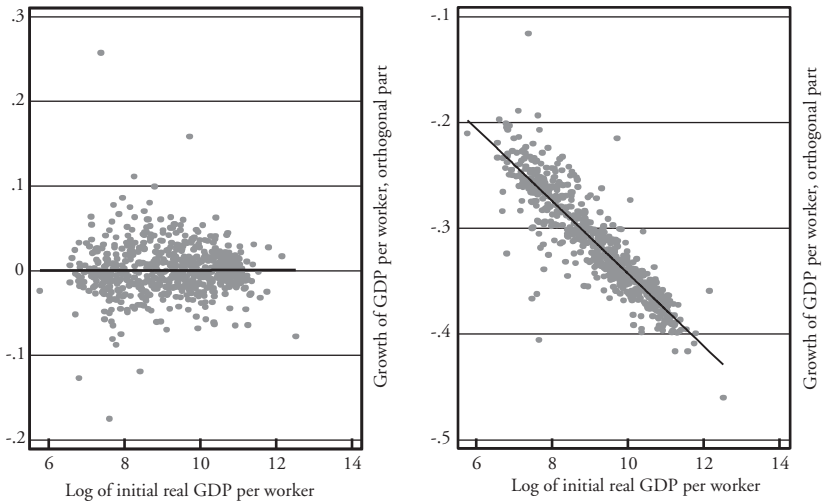
Convergence may fail for many different reasons. The usual, if impossibly broad, presumption is that a combination of exogenous and policy circumstances discourage firms and entrepreneurs from undertaking productivity enhancing investments. A slight refinement on this argument would start from the recognition that developing and emerging market economies typically encompass economic activities of widely varying levels of productivity. They exhibit much greater

dispersion in productivity across activities than rich countries. This is as true at the level of individual plants as it is for broad economic sectors (Bartelsman and others 2006, Hsieh and Klenow 2009, McMillan and Rodrik 2011). Typically, productivity levels tend to converge within economies over the course of economic development, in parallel with the convergence with rich countries' income levels (McMillan and Rodrik 2011).

This heterogeneity means that not all firms or industries are uniformly behind the global technology frontier. Some are considerably more advanced. For example, in India labor productivity in the paper, pulp, and paperboard industry is only 3 percent of the level in the corresponding industry in the United States. This ratio rises to 19 percent—more than six times higher—in the case of motor vehicles.[2] Even making an allowance for differences between average and marginal productivity, India's overall productivity would rise significantly if labor were to move from the paper industry to the auto industry. In a more fine-grained analysis, Hsieh and Klenow (2009) estimate that between a third and a half of the gap in India and China's manufacturing TFP vis-à-vis the United States would be closed if the dispersion in plant productivity within industries were brought to U.S. levels. These findings run parallel to the tradition of "dual economy" models in development economics, which have emphasized the growth gains from shifting resources across broad sectors—from traditional agriculture and informality to manufacturing and modern services.

One reason for such heterogeneity or dualism is that convergence may be easier in some activities than others. Technology may be more standardized and require less local adaptation. It may be easier for firms to access it when they can be part of international production and marketing networks. Direct foreign investment can serve as a vehicle for technology transfer in some areas but not others. Domestic policies and institutions may pose greater obstacles in some sectors than others. In other words, the economy may be a mixture of activities that are already on the escalator up and activities that are going nowhere. Economies that grow rapidly are those that are able to push their resources into the escalator sectors. And those that

Chart 6
Unconditional (Left Panel) and Conditional (Right Panel) Growth Regressions, Decadal Regressions for 1970-2008



Notes: Growth during each decade is regressed on initial log GDP per worker, decade dummies, and (in the case of the regression shown on the right panel) country dummies. Each observation in the figures corresponds to one country over a specific decade (1970s, 1980s, 1990s, or 2000s).

Source: Author's calculations using Penn World Tables data

grow in a sustained fashion are those that can accomplish this on an ongoing basis.

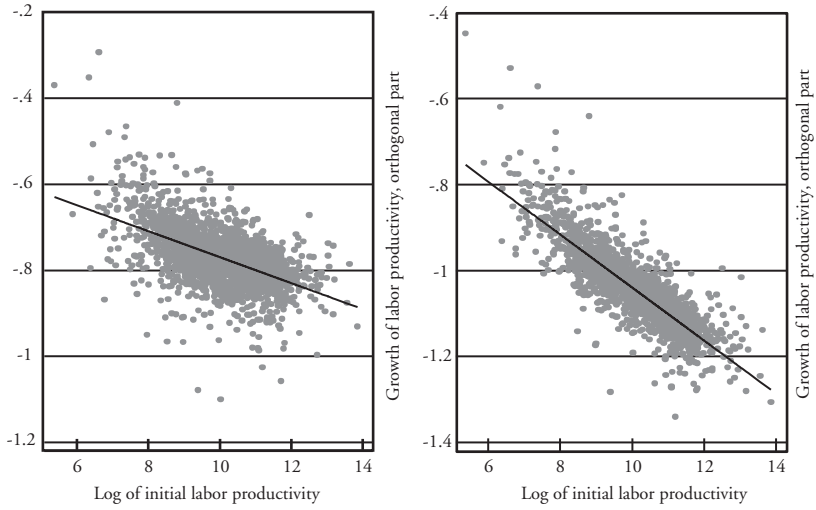
Tradable industries, and manufactures in particular, are the archetypal escalator industries. The best way to see this is to examine the process of productivity convergence at the level of individual industries. To set the stage, let's look first at aggregate productivity, which we know doesn't exhibit automatic (unconditional) convergence. Chart 6 plots the growth in GDP per worker against its initial level. Each dot in the scatter plot corresponds to a country during a specific decade. Four different decades are covered (1970s through the 2000s) so that each country enters the scatter plot (a maximum of) four times. I have controlled for decade-specific influences by introducing decade dummies, so that the plots represent the relationship between initial economywide labor productivity and subsequent growth after those influences are taken out.

Convergence implies that countries starting out with lower productivity experience faster growth in productivity. The scatter plot should show a negatively sloped relationship. In reality, as the left panel of Chart 6 shows, the slope is essentially zero. A country with low labor productivity is no more (or less) likely to grow rapidly than one with high productivity. We obtain convergence only when we condition on specific country characteristics. The right panel shows this with an extreme form of conditioning, the inclusion of country fixed effects. Now we have a clearly negative (and tightly estimated) slope to the relationship. There is convergence conditional on non-time varying country characteristics (e.g., geography, policies, and institutions that do not change over time). Or to put it more directly, growth slows down over time as countries get richer.

The estimated conditional convergence parameter (from the right panel of Chart 6) is -0.034 (with a country-clustered t-statistic of 4.69). This implies that a country with half the income of another grows 2.4 percent (=0.034 x ln(2)) faster per year, assuming it shares all other economically relevant characteristics. This convergence parameter is somewhat above the 0.01-0.03 range that is typically found in the growth literature (Durlauf and others 2005), but that is not surprising in view of my use of country fixed effects.

So far, there is nothing particularly new. Now let's carry out the same exercise for specific manufacturing industries instead of aggregate productivity. I use data from UNIDO's industrial statistics data base (INDSTAT4) to compute labor productivity at the 4-digit level of disaggregation for manufacturing.[3] These data cover mostly the formal, organized parts of industry. They do not go back as far as the Penn World Tables, so I have to restrict the analysis to the period since 1990. In order to maximize the number of countries I pool successive 10-year periods from 1990 to 2007. The analogue of the previous set of convergence results is shown in Chart 7. Unconditional convergence regressions include dummies for industries and decades, while conditional regressions include country fixed effects in addition. Each dot on the scatter plot now represents a 4-digit industry in a specific country over a particular decade.

Chart 7
Unconditional (Left Panel) and Conditional (Right Panel) Growth Regressions for Labor Productivity at the Industry Level, Decadal Regressions for 1990-2007



Notes: The figure depicts the relationship between initial labor productivity and growth in labor productivity during the subsequent decade across ISIC 4-digit industries in pooled decadal cross-sections over 1990-2007. Unconditional regressions (left panel) include industry and decade dummies; conditional regressions (right panel) include country dummies in addition.

Source: Author's calculations from original UNIDO data

The results are quite striking in that they reveal, for the first time, unconditional convergence. The further away from the frontier is an industry, the more rapid the growth in its labor productivity, regardless of the policies or institutions of the country in which it is located (left panel of Chart 7). Once a country gets a toehold in agricultural machinery, say, or motorcycles, there is an automatic tendency for productivity in these industries to converge to the frontier. Moreover the estimated rate of convergence is quite rapid. The coefficient on initial labor productivity is -0.031 and highly statistically significant, not much smaller (in absolute value) than the conditional convergence estimated at the aggregate level. Naturally, conditional convergence at the industry level is even more rapid, with a coefficient of -0.063 (as indicated by the steeper slope on the right-hand side panel of Chart 7).

Two other recent studies have produced related results. In his Harvard dissertation Hwang (2007, chapter 3) has documented that there is a tendency for unconditional convergence in export unit values in highly disaggregated product lines. In other words, once a country begins to export something, it travels up the value chain in that product regardless of domestic policies or institutions.[4] Hwang also shows that the lower the average unit value of a country's manufactured exports, the faster the country's subsequent growth, unconditionally. Second, Levchenko and Zhang (2011) have estimated model-based relative productivity trends for 19 manufacturing industries from the 1960s through the 2000s and show that there has been steady convergence across countries. They interpret this as the erosion of Ricardian comparative advantage.

Further analysis with my data shows that unconditional convergence is not uniform across manufacturing industries. It is least rapid in textiles and clothing (with a coefficient of -0.012) and most rapid in machinery and equipment (-0.039), with transport equipment and iron, steel and metal products somewhere in between. So there is a hierarchy within manufacturing that accords well with intuition. Even within manufacturing some of the escalators move up more quickly than others.

Why then does unconditional convergence within manufacturing —and possibly some modern, tradable services as well—not translate into economywide unconditional convergence? The answer is that the economic activities that are good at absorbing advanced technologies are not necessarily good at absorbing labor. As a result, too large a fraction of an economy's resources can get stuck in the "wrong" sectors—those that are not on the escalator. When firms that are part of international production networks or otherwise benefit from globalization employ little labor, the gains remain limited. Even worse, intersectoral labor flows can be perverse with the consequence that convergence within the "advanced" sectors is accompanied by divergence by the entire economy.

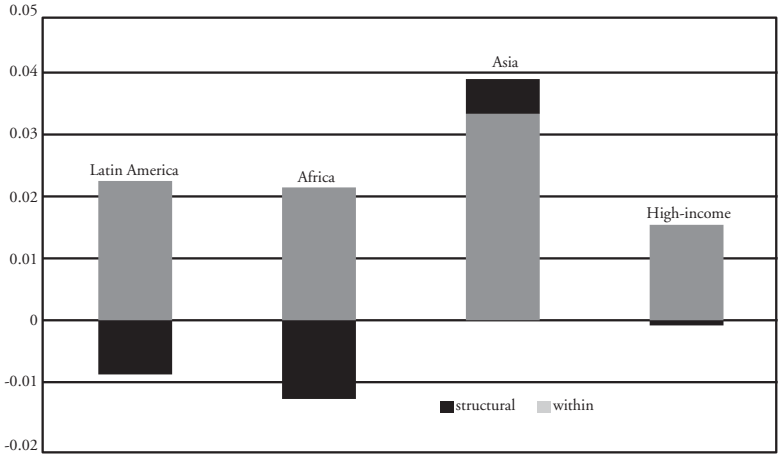
This is not just a theoretical possibility. It turns out to be a large part of the explanation of why Latin America and Africa have underperformed relative to Asia in recent decades. Maggie McMillan and I recently

examined a sample of 38 countries at widely varying levels of income with the requisite data (McMillan and Rodrik 2011). We divided each economy into nine broad sectors and decomposed economywide productivity growth over the 1990-2005 period into two components: (a) productivity growth within individual sectors; and (b) productivity growth resulting from the intersectoral reallocation of labor.[5] The second component, which we call the structural-change component of aggregate productivity growth, can be large when labor productivity varies greatly across different parts of the economy.

Our results, summarized in Chart 8, reveal a striking result: Latin America and Africa have both experienced sizable growth-reducing structural change during 1990-2005. What this means is that labor has tended to move from high-productivity activities, such as manufacturing and tradable services, to low-productivity services, informality, and in some cases even agriculture. This difference with Asia, where structural change has made a positive contribution, accounts in fact for the bulk of the variation in regional growth rates. Asia's labor productivity growth in 1990-2005 exceeded Africa's by 3 percentage points (per annum) and Latin America's by 2.5 percentage points. Of this difference, the structural change term accounts for 1.8 points (61 percent) in Africa and 1.5 points (58 percent) in Latin America. In other words, where Asia has outshone the other two regions is not so much in productivity growth within individual sectors, where performance has been broadly similar, but in ensuring that the broad pattern of structural change contributes to, rather than detracts from, overall economic growth.

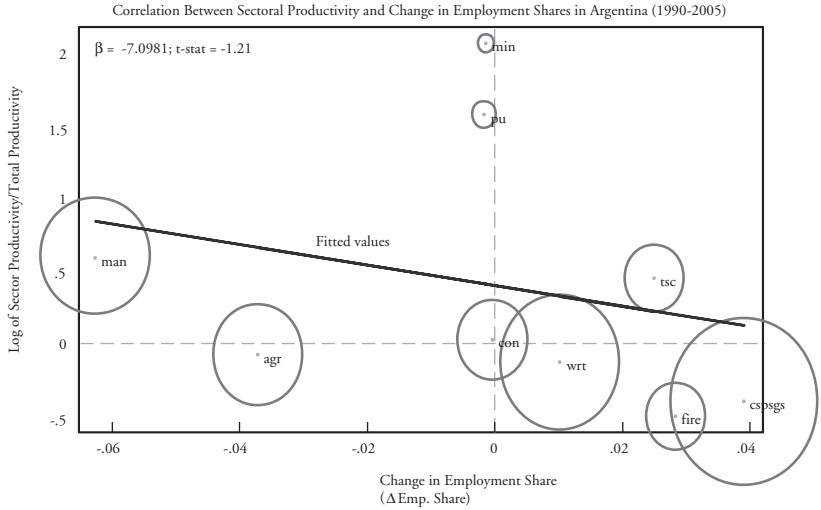
To observe a particularly egregious case of growth-reducing structural change, turn to Argentina's experience (Chart 9). The sector with the largest relative loss in employment over 1990-2005 is manufacturing, which also happens to be the largest sector among those with above-average productivity. Most of this reduction in manufacturing employment took place during the 1990s, under the Argentine experiment with hyper-openness. Even though the decline in manufacturing was halted and partially reversed thanks to a competitive currency during the recovery following the financial crisis of 2001-2002, this was not enough to change the overall picture for the

Chart 8
Decomposition of Growth Between "Within" and "Structural Change" Components, 1990-2005



Note: Regional averages are unweighted averages for countries for which data are available.
Source: McMillan and Rodrik (2011)

Chart 9
Growth-Reducing Structural Change in Argentina, 1990-2005



*Note: Size of circle represents employment share in 1990
** Note: β denotes coefficient of independent variable in regression equation: $\ln(p/P) = \alpha + \beta\Delta$ Emp. Share
Source: McMillan and Rodrik (2011)

period 1990-2005. By contrast, the sector experiencing the largest employment gain is community, personal, and government services, which has a high level of informality and is among the least productive. Hence when we plot the employment gains of individual sectors against their relative productivity we get a sharply negative slope (Chart 9).

We know from the work of Carmen Pages and her co-authors at the Inter-American Development Bank, which inspired my own research in this area, that this pattern of perverse growth-reducing structural change is relatively recent. During the quarter century between 1950 and 1975, the contribution of structural change to overall productivity growth was positive and large, of roughly the same magnitude as the "within" component (slightly below 2 percent per annum; Pages 2010). What seems to have happened since 1990 is that the productivity growth experienced in sectors exposed to external and internal liberalization (manufacturing and state-owned enterprises) has come in part through rationalization and employment reductions. In theory, those displaced from previously sheltered activities ought to have ended up with jobs that are more productive. In practice, it has been low productivity services and informality that have expanded. Asian countries, which liberalized gradually and continued to protect employment in state enterprises and import-substituting firms, were spared the adverse experience.

One of the findings in McMillan and Rodrik (2011) is that dependence on commodity exports makes it tougher for countries to push their resources into the right sectors. Specialization in a few highly profitable primary activities tends not to generate much productive employment, even when it spurs growth. This is yet another version of the natural resource curse.

Africa faces this challenge in particularly severe form. Its recent growth is driven in part by a commodity boom, and in part by better macroeconomic policies and governance reducing the severity and frequency of growth decelerations (Page 2009). Much of it reflects recovery from an extended period of decline (Chart 4). There is scant evidence that a genuine growth engine is in place. As John Page notes, "changes in such 'growth determinants' as investment,

export diversification, and productivity have not accompanied the growth boom." And as Chart 8 shows, perverse structural change has been an even bigger problem constraining aggregate productivity growth than in Latin America.

So convergence can be easy if an economy is able to push its resources (labor in particular) into the "convergence sectors"—the industries on the automatic escalator up. What stands out in the experience of the countries that have experienced rapid and sustained convergence, with the exception of the few oil economies on the list (Table 1), is that their success was rooted in diversification into manufactures. It is accomplishing this process of structural change that has proved difficult in the lagging economies of Latin America and Africa.

As India's example demonstrates, it may be possible sometimes to generate growth on the back of tradable services, such as software and information technologies (IT). But as India also shows, there are limits to the extent of structural change such a model can accomplish. The trouble is that IT industries rely on education and skills that only a small part of the country's huge workforce possesses. Manufacturing industries have much greater potential to absorb the "surplus" labor presently employed in traditional agriculture or informal activities. As India has not been able to demonstrate comparable success in manufactures, its economy generates far too few high-productivity jobs for the unskilled workforce with which it will remain abundantly endowed for some time (Bosworth, Collins, and Virmani, 2007).

V. Why Structural Transformation Requires Unconventional Policies

A "structuralist" focus on growth reorients our attention from broad macroeconomic policies and institutions to the composition of output and sectoral considerations. It points to the need to stimulate desirable structural change in order to ignite and sustain economic growth. It helps us understand why conventional policies of openness and liberalization often fall short, and how they may occasionally backfire. And it explains why the policies behind sustained convergence in Asia have been a mixture of the orthodox (macro stability, investment in human capital, emphasis on exports) with the

unorthodox (undervalued currencies, industrial policies, and significant state intervention).

If some economic activities, such as manufacturing and modern services are growth-drivers, one would expect entrepreneurs, firms, capital, and ultimately employment to gravitate in their direction. For this process to unfold on its own accord, however, markets need to work reasonably well. Only then do sectors with high productivity or good future prospects appear profitable and send the right price signals to investors. Weak markets and institutions impose an especially high "tax" on modern, technologically advanced industries since these rely on an extended division of labor and require a well-developed contractual environment (Rodrik 2008b).

Why then do the conventional policies of macroeconomic stability, liberalization, and openness not do the trick? After all, their objective is precisely to ensure that markets can work better and generate the requisite incentives. As a practical matter, however, creating well-functioning market economies requires considerably more than tinkering with specific policy instruments. It is a process that involves deeper institutional transformation measured in decades rather than years. Laws and regulations can be rewritten quickly, but that is not by and large where a nation's institutions reside. The rules of the game that we call "institutions" are cognitive constructs that shape expectations about how other people behave (North 1990, Pistor 2000). These expectations are difficult to modify and replace, short of wars, occupation, revolutions, or other cataclysmic events. Furthermore, as long as the beneficiaries of the established order remain politically strong, they can easily circumvent reforms that undercut their privileges. As Daron Acemoglu and James Robinson have emphasized in their various writings, sustainable economic growth ultimately requires political change (Acemoglu and Robinson, forthcoming).

One not very helpful manner in which these practical realities have been taken on board is to make the list of requisite reforms ever longer and hazier. So what was initially a (mostly) straightforward list of "ten commandments" (as originally articulated by John Williamson in the Washington Consensus) has been embellished several times over with increasing vagueness. Concrete reforms such as trade liberalization and privatization have been supplemented

with objectives such as "improving macroeconomic and labor market institutions, and strengthening legal and judicial systems" (Singh and others 2005). First-generation reforms were succeeded by second- and third-generation reforms. "Structural reforms" became a code word for everything that prevents an economy from working like its textbook counterpart. Many of the institutional recommendations would eventually morph into an impossibly broad and ambitious agenda under the general heading of governance reforms.

With such broad characterizations of what growth requires it becomes effectively impossible to provide well targeted policy advice. Telling poor countries in Africa or Latin America that they should set their sights on the institutions of the United States or Sweden is like telling them that the only way to develop is to become developed. Nor is it possible to judge whether countries have undertaken the requisite reforms. If countries are not growing it must be because they haven't done enough. If they are, it is thanks to their reforms. As mentioned previously, the very same reforms that were criticized as inadequate a few years ago are now hailed as the reason for emerging and developing countries' recent performance.

A different, more constructive perspective on successful reform is that it requires not checking off a list of textbook recommendations, but shortcuts that overcome second-best interactions and political constraints. Skilled reformers know that a given economic objective can be achieved in diverse ways, some more unorthodox than others. Integration into the world economy can be accomplished via export subsidies (as in South Korea and Taiwan), export processing zones (as in Mauritius or Malaysia), special economic zones (as in China)—or free trade (as in Hong Kong). Domestic industries can be promoted through subsidized credit (South Korea), tax incentives (Taiwan), trade protection (Brazil, Mexico, and Turkey), or by reducing barriers to entry and lowering their costs of doing business. Property rights can be enhanced by importing and adapting foreign legal codes (as in Japan during the Meiji restoration) or by developing domestic variants (as in China and Vietnam). A "messy" reform that buys off the beneficiaries of status quo may be preferable to the "best practice" which proves impossible to implement.

Nowhere has this opportunistic approach to economic reform been taken further than in China. Consider how China engineered a boom in private investment, which was led until the mid-1990s by Township and Village Enterprises (TVEs). Ownership in TVEs was typically held by local governments, but private entrepreneurs were effectively partners with the government. In a system where courts were weak and corruptible, letting the government hold residual rights in the enterprise may have been a second-best mechanism for avoiding expropriation. In such circumstances, the expectation of future profits can exert a stronger discipline on the public authority than fear of legal sanction. Private entrepreneurs felt secure not because the government was prevented from expropriating them, but because, sharing in the profits, it had no interest to expropriate them. This allowed China to provide a semblance of effective property rights despite the absence of private property rights.

We can multiply the examples. China provided market incentives through two-track reform rather than across-the-board liberalization, which would have been the standard advice. Hence, in agriculture and industry, price efficiency was achieved not by abolishing quotas, planned allocations, or price controls, but by allowing producers to trade at market prices at the margin. In international trade, openness was achieved not by reducing import protection, but by creating special economic zones with different rules than those that applied for domestic production. When China eventually joined the WTO, the country did not stop promoting its industries, but shifted from trade and direct industrial policies (now banned by international rules) to currency undervaluation (Rodrik 2008a, 2010a).

These and other instances of locally tailored policy innovations have been at the core of China's successful reforms. Chinese reformers had the willingness to experiment with different remedies, the self-confidence to defy external blueprints, and the room to pursue economic growth as their overarching goal. In societies whose political economy is more constraining—India immediately comes to mind—it may be considerably more difficult to devise and apply the tailored policy solutions that will accomplish the needed economic changes.

A second complication is that the standard remedies overlook market imperfections inherent to establishing a beachhead in new industries and getting them off the ground. Such market failures include:

learning externalities—valuable technological, marketing, and other information that spills over to other firms and industries;

coordination externalities—lumpy and coordinated investments that are required to establish new industries;

credit market imperfections—limited liability, asymmetric information, and other imperfections that prevent entrepreneurs from financing worthwhile projects;

wage premia—monitoring, turnover, and other costs that keep wages above market-clearing levels and employment low.

Such problems can plague all kinds of economic activity in developing countries, but arguably their effects are felt much more acutely in modern industries (Rodrik 2008b). Consequently, structural change can remain too slow even when markets are liberalized, opened up, and made to work "better" in the conventional manner. Growth requires remedies targeted at these "special" sectors rather than general policies.

These considerations explain why successful countries have typically found it easier to accomplish the needed structural transformation in an unorthodox manner, by subsidizing their modern tradables directly rather than attempting to remove market and government imperfections and waiting for markets to work their magic. Such subsidies include undervalued currencies, explicit industrial policies in support of new economic activities (trade protection, export subsidies, domestic content requirements, tax and credit incentives), and a certain degree of repression of finance to enable subsidized credit, development banking, and currency undervaluation. What has come to be called the "Asian model" or sometimes the "Beijing consensus" has proved more effective at gaining traction on growth—even though the extent to which it can be applied in other settings remains unclear.

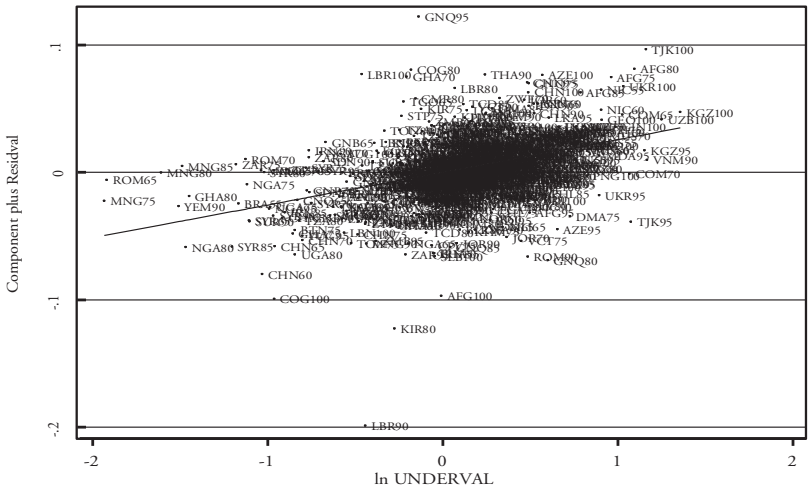
Of all methods of subsidizing modern tradables, perhaps the most effective is currency undervaluation. Growth-promoting structural change is greatly assisted by a highly competitive real exchange rate. In Rodrik (2008b) I show that there is a systematic and robust association between undervaluation and economic growth, a relationship that seems to work through undervaluation's positive effects on industrialization. (My measure of "undervaluation" is the inverse of the relative price level in a country, stripped off the Balassa-Samuelson effect.) This relationship is portrayed in Chart 10, which shows that it is driven neither by outliers nor by the adverse effects of overvaluation alone. As I show in Rodrik (2008b), the estimated relationship is not affected by removing large overvaluations from the sample. According to the baseline specification, a 50 percent undervaluation—which corresponds to roughly one standard deviation—is associated with a boost in annual growth of real income per capita of 1.3 percentage points, a moderately large effect.

Importantly, this result holds only for developing countries, and it is larger in magnitude the lower the income level of the country in question. The real exchange rate has no statistically perceptible effect on growth for countries at or above Spain's or Taiwan's level of income. This reinforces the idea that undervaluation helps offset market and government failures that are endemic to underdevelopment.

There is less evidence on the efficacy of specific industrial policies, and indeed much controversy over whether they work or not (Rodrik 2008b). Two things seem clear and uncontroversial. First, there have been many failures: grandiose projects, white elephants, and infant industries that never grew up while continuing to swallow public resources. Second, many (if not most) of the developing world's successful export industries were bolstered by industrial supports during their early years.

Examples abound in Asia, as usual. The Korean steel firm, POSCO, was nurtured under public ownership and protected behind high walls of protection. It eventually became the most efficient firm in the global steel industry by the 1990s. Domestic content re-

Chart 10
Real exchange rate competitiveness and economic growth in developing countries



Notes: The figure shows the (partial) relationship between an index of undervaluation of the currency and economic growth over five-year time horizons, controlling for initial income levels and country and time fixed effects.

Source: Rodrik (2008b).

quirements, the bane of trade economists, have been instrumental in creating nearly world class first-tier suppliers to the auto industry in both China and India (Sutton 2005). But there are illustrations elsewhere, too. Embraer, the Brazilian aircraft company, was established and promoted through state ownership, benefited from export subsidies, and became a leading global competitor prior to, but especially after, its privatization. Chile's highly successful salmon industry is largely the creation of Fundacion Chile, a quasi-public agency that acted as a venture fund and developed and disseminated the relevant technology. In fact, it is rather difficult to identify instances of nontraditional export successes in Latin America and Asia that did not involve government support at some stage (Rodrik 2007, chapter 4).

Nevertheless, the fact that such policies are so controversial is indicative of the problems that their use often entails. The difficulties come in two forms. First, there is the informational question of appropriate targeting. Broad, economywide reforms may be ineffective or fail to hit the right targets, but at least they do not create

inefficiencies on their own, unless through some adverse second-best interaction. But supporting the economies' activities that do not generate spillovers, or are otherwise subject to market failures, will waste resources straight and simple. Since the requisite information is always imperfect at best, poor targeting is an ever-present risk with industrial policies. Currency undervaluation is often preferred for its nonselective nature, but that is actually a big problem in this context:undervaluation ends up subsidizing a lot of activities—traditional commodity exports, in particular—that do not need to be subsidized while also unnecessarily taxing imports across the board.

The second complication is the problem of political capture. As the opponents of industrial policy never tire to point out, selective and sectoral policies can be manipulated by firms and become a source of rent seeking. Politically connected businessmen can lobby for and obtain subsidies, protection, and entry barriers to generate easy profits under the guise of building new industries.

These difficulties, along with economists' natural aversion to government intervention in markets, have given industrial policies a bad name at least since the 1980s—even though their empirical record is nowhere as bad as is often asserted.[6] Often policymakers from countries that have manifestly benefited from them, such as Chile, do their best to hide it, as if their market-oriented reputation would be tarnished if the fact were better known.[7] Even though they are coming back into fashion, industrial policies are often smuggled into the discussion through the backdoor, by packaging them under different names such as innovation policies, productive development policies, competitiveness policies, cluster policies, etc.

Despite the intellectual opprobrium, the external environment has been traditionally quite permissive of the use of industrial policies by developing countries, at least until recently. The WTO has fairly strict rules against the use of export subsidies (defined somewhat broadly) and domestic content requirements—except for the poorest countries, which are exempt. But many practices have remained under the radar screen. A determined government can get an entire

industry up and running by the time the WTO appellate panel rules on a case. We can expect this to change if industrial policies are used more widely and the rich nations continue to struggle with high unemployment and low growth. Policies that favor domestic industries will then be perceived—with some justification—as violating the basic rules of the game and aggravating economic problems in importing countries. There will be much greater domestic political pressure to retaliate against such policies.

There are no internationally binding agreements against currency undervaluation, but the question of "currency manipulation" has already become a flash point in the global economy. Unlike industrial policies, which need not create macroeconomic imbalances,[8] currency undervaluation is associated with trade surpluses. That means in turn that advanced countries, as a whole, must be willing to run the counterpart trade deficits. The United States, as the largest deficit country, tended to treat its external imbalance with benign neglect. The financial and economic crisis has rendered that approach more difficult to sustain.

One of the striking features of the high-growth period in the run-up to the financial crisis was the turnaround in the current account position of the developing world. Even though China attracted the greatest attention with a surplus that amounted to more than 18 percent of its exports of goods and services in 2002-08, all regions of the world, including Africa and especially Latin America, experienced a sharp improvement in their current account balances (Table 2). India essentially ran a balanced current account over 2002-08, while Latin America ran a surplus for the first time in decades. Whether driven by undervalued currencies and mercantilism or not, developing country trade surpluses are inconsistent with the desire of industrial countries to prop up aggregate demand for their flailing economies.

No emerging country faces a bigger challenge here than China. Prior to the late 1990s, China's manufacturing industries were promoted by a wide variety of industrial policies, including high tariffs, investment incentives, export subsidies, and domestic content requirements on foreign firms. As a pre-condition of WTO membership, China had to phase out most of these policies. From levels that

were among the highest in the world as late as the early 1990s China's import tariffs fell to single-digit levels by the end of the decade. Local content requirements and export subsidies were eliminated. Currency undervaluation, or protection through the exchange rate, became the de facto substitute.

It has now become conventional wisdom in the West that China has to transition to a different growth model, one that replaces foreign with domestic demand. However, if what matters for China's growth is ultimately the structure of production, a shift in the composition of demand may do real harm to the economy's growth. A reorientation toward services and domestic consumption would reduce the demand for its industrial products and blunt the forces of convergence described earlier.

To get a sense of the growth penalty in question, we can resort to the estimates I reported earlier, from Rodrik (2008b). The partial correlation between my index of (log) undervaluation and annual growth is 0.026 for developing countries as a whole, and 0.086 for China. The higher estimate we get for China may be due to the country's large reservoir of surplus labor and the huge gap in the productivity levels of modern and traditional parts of the economy. This estimate implies that a 20 percent appreciation would reduce China's growth rate by nearly 2 percentage points (0.20x0.086 = 1.72). This is a sizable effect, and a slowdown of this magnitude would push China dangerously close to the minimum threshold its leadership apparently believes is necessary to maintain social peace and avert social strife.

China is a special case for sure. Its leadership has been very successful since the late 1970s in tinkering with the policy regime in order to maintain the growth momentum. Perhaps it will continue to show similar ingenuity in the future. But China's case illustrates in extremis the difficulties that growth policies that promote structural transformation in the developing world will pose for underperforming industrial economies. Both because they are difficult to use and because they will raise tensions with trade partners when successful,

it is difficult to envisage that growth promoting diversification policies will be employed en masse and effectively.

VI. Concluding Remarks

There is good news and bad news in this paper. The good news is that there is unconditional convergence after all. But we need to look for it in the right place: in manufacturing industries (and possibly modern services) instead of entire economies. The key to growth is getting the economy's resources to flow into those "convergence industries."

The bad news is that this is not easy to accomplish. It would be nice if governments simply had to stabilize, liberalize, and open up, and markets would do the rest. Alas, that is not how sustained convergence was achieved in the past. Continued rapid growth in the developing world will require proactive policies that foster structural transformation and spawn new industries—the kind of policies that today's advanced economies employed themselves on the way to becoming rich. Such policies have never been easy to administer. They will face the added obstacle over the next decade of an external environment that is likely to become increasingly less permissive of their use.

One of the paradoxes of the last two decades of globalization is that its biggest beneficiaries have been those countries that have flouted its rules—countries like China and India that have effectively played the game by Bretton Woods rather than post-1990 rules (controlled finance, controlled currencies, industrial policies, significant domestic maneuvering room). But as such countries become large players and turn into targets for emulation, the tensions become too serious to ignore. How we handle those tensions will determine not only the future of convergence but the future of the world economy, as well.

Author's note: I am grateful to Arvind Subramanian for helpful conversations and to UNIDO for making their INDSTAT4 data base available. I also thank Cynthia Balloch for research assistance and the Weatherhead Center for International Affairs at Harvard for financial assistance.

Endnotes

[1]Neither does demography help explain the underperformance. Recent growth rates look even more disappointing, compared to the earlier period, when expressed in per-worker terms.

[2]These data are from UNIDO's INDSTAT database and are for 2005. Note that differences in capital intensity cannot explain this heterogeneity. Labor shares of value added are similar for the two countries in the paper industry, and actually higher in India in the case of motor vehicles.

[3]Illustrative industries: macaroni, noodles and similar products, pesticides and other agro-chemical products, agricultural and forestry machinery.

[4]Hwang demonstrates his result for both 10-digit U.S. HS import statistics and 4-digit SITC world trade statistics. The first classification contains thousands of separate product lines.

[5]The decomposition is:

$$Y_t = \sum_{i=n} \theta_{i,t-k} \quad y_{i,t} + \sum_{i=n} y_{i,t} \quad \theta_{i,t}$$

where Y_t and $y_{i,t}$ refer to economywide and sectoral labor productivity levels, respectively, and $\theta_{i,t}$ is the share of employment in sector i. The Δ operator denotes the change in productivity or employment shares between t-k and t. The first term in the decomposition is the weighted sum of productivity growth within individual sectors, where the weights are the employment share of each sector at the beginning of the time period. This is the "within" component of productivity growth. The second term captures the productivity effect of labor reallocations across different sectors.

[6]The TFP growth of Latin American countries after 1990 lagged significantly the performance prior to 1980 (Bosworth and Collins 2003). This suggests, at the very least, that the import-substitution policies of the past were able to produce respectable efficiency gains overall.

[7]Chile's export industries in agriculture (grapes, wine), forestry, and fisheries (salmon) have all benefited greatly from government support in the form of subsidies and public R&D.

[8]A production subsidy on tradables can spur the output and employment in tradables without generating a trade surplus, if the exchange rate is allowed to adjust appropriately. See Rodrik (2010b).

References

Acemoglu, Daron, and James Robinson. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, Crown Business, New York, forthcoming.

African Development Bank. (2011). "The Middle of the Pyramid: Dynamics of the Middle Class in Africa," Market Brief, Chief Economist Complex, April.

Bartelsman, Eric, John Haltiwanger, and Stefano Scarpetta. (2006). "Cross Country Differences in Productivity: The Role of Allocative Efficiency," December.

Bosworth, Barry M., and Susan M. Collins. (2003). "The Empirics of Growth: An Update," Brookings Institution, Washington, D.C., September (*http://www.brookings.edu/papers/2003/0922globaleconomics_bosworth.aspx*).

Bosworth, Barry M., Susan M. Collins, and Arvind Virmani, (2007). "Sources of Growth in the Indian Economy," NBER Working Paper No. 12901, February.

Citigroup Global Markets. (2011). "Global Growth Generators: Moving Beyond 'Emerging Markets' and 'BRIC'," Global Economics View, 21 February.

Durlauf, Steven N., Paul A. Johnson, and Jonathan R.W. Temple. (2005). "Growth Econometrics," in P. Aghion and S.N. Durlauf, eds., *Handbook of Economic Growth*, vol. 1a, Elsevier North-Holland, Amsterdam.

Easterly, William. (2005). "National Policies and Economic Growth: A Reappraisal," in P. Aghion and S.N. Durlauf, eds., *Handbook of Economic Growth*, vol. 1a, Elsevier North-Holland, Amsterdam.

Hsieh, Chang-Tai, and Peter J. Klenow. (2009). "Misallocation and Manufacturing TFP in China and India," *Quarterly Journal of Economics*, November.

Hwang, Jason J. (2007). "Patterns of Specialization and Economic Growth," unpublished Ph.D. dissertation, Economics Department, Harvard University, May.

Krueger, Anne O. (2004). "Meant Well, Tried Little, Failed Much: Policy Reforms in Emerging Market Economies," Roundtable Lecture, Economic Honors Society, New York University New York, March (*http://www.imf.org/external/np/speeches/2004/032304a.htm*).

Levchencko, Andrei A., and Jing Zhang. (2011). "The Evolution of Comparative Advantage: Measurement and Welfare Implications," NBER Working Paper No. 16806 (*http://www.nber.org/papers/w16806*), February.

Maddison, Angus, "Historical Statistics of the World Economy: 1-2008 AD," available at *http://www.ggdc.net/maddison/Historical_Statistics/horizontalfile_02-2010.xls.*

McMillan, Margaret S., and Dani Rodrik. (2011). "Globalization, Structural Change and Productivity Growth," NBER Working Paper No. 17143, (*http://www.nber.org/papers/w17143*), June.

North, Douglass C. (1990) Institutions, Institutional Change, and Economic Performance, Cambridge University Press, Cambridge and New York.

Page, John. (2009). "Africa's Growth Turnaround: From Fewer Mistakes to Sustained Growth," Commission on Growth and Development Working Paper No. 54, Washington, D.C.

Pages, Carmen ed. (2010). "The Age of Productivity" Inter-American Development Bank, Washington, D.C.

Pistor, Katharina. (2000). "The Standardization of Law and Its Effect on Developing Economies," G-24 Discussion Paper series, No. 4, June (*http://www.unctad.org/en/docs/pogdsmdpbg24d4.en.pdf*).

Pritchett, Lant. (1997). "Divergence, Big Time," The Journal of Economic Perspectives, vol. 11, no. 3, Summer, pp 3-17.

PwC. (2011). "The World in 2050 – The accelerating shift of global economic power: challenges and opportunities," January (*http://www.pwc.com/en_GX/gx/world-2050/pdf/world-in-2050-jan-2011.pdf*).

Rodrik, Dani. (2006). "Goodbye Washington Consensus, Hello Washington Confusion?" *Journal of Economic Literature*, XLIV, December, pp 969-983.

Rodrik, Dani. (2007). *One Economics, Many Recipes: Globalization, Institutions and Economic Growth*, Princeton University Press.

Rodrik, Dani. (2008). "Second-Best Institutions," *American Economic Review, Papers and Proceedings*, May.

Rodrik, Dani. (2008b). "The Real Exchange Rate and Economic Growth," *Brookings Papers on Economic Activity*.

Rodrik, Dani. (2008c). "Normalizing Industrial Policy," Commission on Growth and Development Working Paper No. 3, Washington, D.C.

Rodrik, Dani. (2010). "Making Room for China in the World Economy," American Economic Review, Papers and Proceedings, May.

Rodrik, Dani. (2010b). "Growth After the Crisis," in Michael Spence and Danny Leipziger, eds., Globalization and Growth: Implications for a Post-Crisis World, Commission on Growth and Development, Washington, D.C.

Singh, Anoop, Agnes Belaisch, Charles Collyns, Paula De Masi, Reva Krieger, Guy Meredith, and Robert Rennhack. 2005. "Stabilization and Reform in Latin America: A Macroeconomic Perspective of the Experience since the 1990s," IMF Occasional Paper 238.

Spence, Michael. (2011). The Next Convergence: The Future of Economic Growth in a Multispeed World, Farrar, Straus and Giroux, New York.

Subramanian, Arvind. (2011). *Eclipse: Living in the Shadow of China's Economic Dominance*, Peterson Institute for International Economics, Washington, D.C.

Summers, Lawrence H. (2003). "Godkin Lectures," Harvard University, Kennedy School of Government.

Sutton, John. (2005). "The Auto-component Supply Chain in China and India: A Benchmark Study," in Francois Bourguignon and Boris Pleskovic, eds., *Annual Bank Conference on Development Economics 2005: Lessons of Experience,* Washington D.C., World Bank.