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## GROWTH AFTER THE CRISIS

Dani Rodrik

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Dani Rodrik, Harvard University and CEPR

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Centre for Economic Policy Research  
53–56 Gt Sutton St, London EC1V 0DG, UK  
Tel: (44 20) 7183 8801, Fax: (44 20) 7183 8820  
Email: [cepr@cepr.org](mailto:cepr@cepr.org), Website: [www.cepr.org](http://www.cepr.org)

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## **ABSTRACT**

### **Growth After the Crisis\***

How hospitable will the global environment be for economic growth in the developing world as we come out of the present financial crisis? The answer depends on how well we manage the following tension. On the one hand, global macro stability requires that we prevent external imbalances from getting too large. On the other hand, growth in poor nations requires that the world economy be able to absorb a rapid increase in the supply of tradables produced in the developing world. It is possible to render these two requirements compatible, but doing so requires greater use of explicit industrial policies in developing countries, which have the potential of encouraging modern tradable activities without spilling over into trade surpluses. The “price” to be paid for greater discipline on real exchange rates and external imbalances is greater use (and permissiveness towards) industrial policies.

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Dani Rodrik  
Kennedy School of Government  
Harvard University  
79 John F. Kennedy Street  
Cambridge, MA 02138  
USA  
Email: [dani\\_rodrik@harvard.edu](mailto:dani_rodrik@harvard.edu)

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## I. Introduction

The last fifty years were a remarkable period in world economic history. Not only did we experience unprecedented rates of technological advance and economic growth in this period, but an increasing number of hitherto poor countries—those in the periphery of the North Atlantic economic core—were able to participate in this progress. The current crisis presages a new era, one which may be significantly less hospitable to the growth of poor countries. It is too early to know how long it will take for financial stability to be restored in the advanced countries and recovery to set in. But even with the worst of the crisis over, it is likely that we will enter a period in which world trade will grow at a slower pace, there will be less external finance, and the appetite of the United States and other rich nations to run large current account balances will be significantly diminished.

This paper focuses on the implications of this scenario for the growth prospects of developing nations. In particular, it asks whether we can reconcile two apparently conflicting demands on the world economic system. On the one hand, global macroeconomic stability requires that we avoid large current account imbalances of the type that the world economy experienced in the run-up to the crisis. Epitomized by the U.S-China bilateral trade relationship, these imbalances played at the very least an important supporting role in bringing the financial crisis on. In the next stage of the world economy, there will be much greater pressure on countries with large deficits or surpluses to reduce these imbalances through adjustments in their currency and macroeconomic policies.

But on the other hand, a return to high growth in the developing countries requires that these countries resume their push into tradable goods and services. As I will argue below, countries that grew rapidly in the post-war period were those that were able to capture a growing

share of the world market for manufactures and other non-primary products. Prior to the crisis of 2008, this push was accommodated by the willingness of the United States and a few other developed nations to run large trade deficits. This is no longer a feasible strategy for large or middle-income developing nations.

So are the requirements of global macro stability and of economic convergence at odds with each other? Will the developing nations' need to generate large increases in the supply of tradables inevitably clash with the world's intolerance of trade imbalances?

No, not necessarily. There is in fact no inherent conflict, once we understand that what matters for growth in developing nations is not the size of their trade surplus, nor even the volume of their exports. As I will show in this paper, what matters for growth is their *output* of non-traditional tradables, which can expand without limit as long as domestic demand expands at the same time. Maintaining an undervalued currency has the upside that it subsidizes the production of tradables; but it also has the downside that it taxes the domestic consumption of tradables—which is why it generates a trade surplus. It is possible to have upside without the downside, by encouraging tradables production directly. A large part of this paper is devoted to making this rather simple, if important and overlooked point.

There are many ways in which the profitability of tradables can be enhanced, including reducing the cost of non-traded inputs and services through appropriately targeted investments in infrastructure. But it is reasonable to expect that industrial policies will be part of the arsenal. So the external policy environment will have to be more tolerant of such policies, including explicit subsidies on tradables (as long as the effects on the trade balance are neutralized through appropriate adjustments in the real exchange rate). Permissiveness on industrial policies is the “price” to be paid for greater discipline on real-exchange rates and external imbalances.

The bottom line is that the growth potential of developing nations need not be severely affected as long as the implications of this new world for domestic and international policies are well understood.

To trace out the likely effect of the crisis on growth, we need to have a good fix on the drivers of growth. So I begin the paper by providing an interpretation of growth performance in the world economy since the end of the Second World War. I argue that engine of growth has been rapid structural change in the developing nations—from traditional, primary products to non-traditional, mostly industrial products. This structural transformation was facilitated by what I will call “productivist” policies in successful countries. I then ask how the contours of the world economy post-crisis is likely to affect this process. Slow growth in the developed world and reduced appetite for international lending do not directly threaten growth prospects in developing nations. The threat is that lower demand for (or acceptance of) imports from developing countries will make it harder for these countries to engage in rapid structural change. This threat can be averted by developing nations employing more balanced growth strategies which allow consumption of tradables to expand alongside production. I present the simple analytics of subsidies on tradables to show how it is possible to engineer structural change in the direction of tradables without generating trade surpluses along the way. I also provide some illustrations of the kind of policies that can be used.

## II. The miracle years

The period since 1950 has been quite unique in terms of economic growth. As Figure 1 reveals, what is truly remarkable about this era is not that the *overall* rate of economic growth has been high by historical standards. In fact, taken as a whole, the post-1950 period did not

greatly outperform the gold standard era during 1870-1913. What stands out after 1950 is the stupendously high rates of growth achieved by the *best performing* countries. Japan, South Korea, and China were the growth champions during the three sub-periods 1950-1973, 1973-1990, and 1990-2005, respectively, with annual per-capita growth rates between 6 to 8 percent. These rates are historically unprecedented and greatly exceed those experienced by the growth champions of earlier eras. For example, the most rapidly growing country under the classical gold standard, Norway, registered a per-capita annual growth rate barely above 2 percent.

So something happened in the world economy after about 1950 which allowed it to support much more rapid economic convergence in the lower income countries. What was this change? Commodity-price led booms and capital-inflow cycles can explain short-term changes in economic performance, and these clearly had something to do with the high growth we have seen throughout the developing world in the most recent decade prior to the crash of 2008. But the longer-term nature of the expansion of the growth frontier suggests that something more fundamental, and much more of a secular nature, changed as well.

Conventional accounts, heavily influenced by the Chinese miracle of the last quarter century, emphasize the enabling role of globalization. This too provides a poor explanation. The international integration of markets in goods and assets gathered speed slowly and reached its apogee only after the 1990s, whereas economic convergence on the part of successful countries was as rapid in the couple of decades after 1950 as it has been more recently. China was preceded by South Korea, which was in turn preceded by Japan. There was, if anything, a greater number of developing countries in Asia, Latin America, and Africa that experienced rapid convergence in the initial decades after the Second World War than there has been in more recent decades (Rodrik 2007a, chapter 1).

What is common about Japan, South Korea, and China is that they based their growth strategies on developing industrial capabilities, rather than on specializing according to their (static) comparative advantages. They each became manufacturing superpowers in short order—and much more rapidly than one would have expected based on their resource endowments. China’s export bundle was built up using strategic industrial policies that forced foreign companies to transfer technology, and as a result resembles one for a country that is three or four times as rich (Rodrik 2006). South Korea started out with very little manufacturing capability and quickly moved from simple manufactures (in the 1960s) to more complex products (in the 1970s). Japan, unlike the other two countries, had developed an industrial base (prior to the Second World War), but this base was totally destroyed in the war and was restored thanks to trade and industrial policies that protected domestic producers.

The general lesson to be drawn from the experience of these post-war growth champions is this: High-growth countries are those that are able to undertake rapid structural transformation from low-productivity (“traditional”) to high-productivity (“modern”) activities. These modern activities are largely tradable products, and within tradables, they are mostly industrial ones (although tradable services are clearly becoming important as well).<sup>1</sup> In other words, poor countries become rich by producing what rich countries produce.

This experience is quite different from the 19th century pattern of growth, where success in the periphery was based on specialization in commodities and primary products. It explains why high-performers in the postwar period have been able to grow so much faster than the growth champions of earlier eras (e.g., Mexico in 1870-1913 or Norway in 1913-1950--see Figure 1).

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<sup>1</sup> See Felipe et al. (2007) for a recent analysis of structural change patterns in Asia which emphasizes that many services have become important contributors to economy-wide TFP growth alongside industry.



The close association between movement into industry and high growth is evident in the post-war data. This is shown in Figures 2 and 3 for two measures of industrial activity, the share of industrial value added in GDP and the share of industrial employment in total employment respectively. I have regressed 5-year averages for economic growth on corresponding averages for industrial activity, controlling for initial income levels as well as fixed effects for countries and time periods. Note that the economically relevant distinction here is between “modern” and traditional, not between industry and the rest of the economy. There are modern, tradable activities in agriculture (e.g. horticulture) and services (e.g., call centers) as well. But in the absence of data for a large enough sample of countries, I use “industry” as my proxy for non-traditional activities.

The scatter plots show what happens to growth when the shares of industrial output or employment change over time within a country. (Note that country fixed effects absorb time-invariant factors specific to individual economies.) In each case, the message is loud and clear. An expansion of industrial activity is closely associated with faster economic growth. Moreover, unlike what a simple comparative advantage story would suggest, this relationship is not any weaker in lower-income countries. The slope coefficient changes very little over different income ranges.

Why is transition into modern industrial activities an engine of economic growth? As I discuss in Rodrik (2009) and in line with a long tradition of dual-economy models, the answer seems to be that there exist significant gaps between the social marginal productivities in traditional and modern parts of developing economies. Even very poor economies have economic activities—horticulture in Ethiopia, auto assembly in India, consumer electronics in China—

where productivity levels are not too far off from what we observe in the advanced economies.<sup>2</sup> As resources move from traditional activities towards these, economy-wide productivity increases. These gaps can be due to a wide range of features that are specific to underdevelopment. I discuss two broad categories in Rodrik (2009). One has to do with institutional weaknesses-such as poor protection of property rights and weak contract enforcement-which make themselves felt more intensively in tradable activities. The second are various market failures and externalities-e.g., learning spillovers and coordination failures-associated with modern activities. In both cases, industrial activity and investment are underprovided in market equilibrium. Anything that speeds up structural transformation in the requisite direction will speed up the rate of economic growth.

What is the secret for achieving this structural transformation? Even though actual policies have differed significantly across successful countries, one can still identify some important common elements. First, it is clear that sound “fundamentals” have played a role, as long as we interpret the term quite broadly and not associate it with any specific laundry list of policies (such as the Washington Consensus or the governance reforms that are in fashion currently). Thus all successful countries have had governments that have prioritized economic growth, followed market-friendly policies, and maintained macroeconomic stability. It is probably true to say that these are the sine qua non of economic growth. But the ways in which these principles can be put into practice are so numerous and context-specific that enunciating them hardly provides a guide to action (Rodrik 2007).

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<sup>2</sup> What is striking also is that there exists significant heterogeneity in productivity within “modern” activities as well. This is documented in detailed McKinsey productivity studies (McKinsey Global Institute 2001 and 2003) as well as recent academic work (Bartelsman et al. 2006, Hsieh and Klenow 2007). One way to interpret these findings is that segments of what we normally think of as “modern” are really more akin to “traditional” activities. The structural transformation that is called for is also *within* these sectors.

Second, all successful countries have followed what one might call “productivist” policies. These are activist policies aimed at enhancing the profitability of modern industrial activities and accelerating the movement of resources towards modern industrial activities. They go considerably beyond the conventional recommendation to reduce red tape, corruption, and the cost of doing business. They entail in addition (or sometimes instead):

- explicit *industrial policies* in support of new economic activities (trade protection, subsidies, tax and credit incentives, special government attention);
- *undervalued currencies* to promote tradables; and
- a certain degree of *repression of finance*, to enable subsidized credit, development banking, and currency undervaluation.

It true that industrial policies have often failed. But it is also true that it is virtually impossible to identify countries, whether in Asia (South Korea, Taiwan) or in Latin America (Chile), that have done well without them. Just as it is the case with fiscal policy, say, or education policy, what distinguishes good performers from bad performers is not the presence or absence of the policy, but the skill with which it has been implemented.

The reason that undervaluation of the currency works as a powerful force for economic growth is that it acts as a kind of industrial policy. By raising the domestic relative price of tradable economic activities, it increases the profitability of such activities, and spurs capacity and employment generation in the modern industrial sectors that are key to growth. Table 1, adapted from Rodrik (2009), shows the mechanism at work. Columns (1) and (2) are fixed-effects panel regressions which establish that high levels of the real exchange rates (undervalued currencies) are associated with larger industrial sectors, measured by either output or employment. Columns (3) and (4) are in turn the second-stage of TSLS regressions which show

that undervalued currencies result in higher growth, *through* their effects on the size of industry. As discussed in detail in Rodrik (2009), this association between undervalued currencies and high growth is a very robust feature of the post-war data, particularly for lower-income countries.

Undervaluation has the practical advantage, compared to explicit industrial policies, of being an across-the-board policy not requiring selectivity and therefore entailing fewer agency problems (rent-seeking and corruption). Perhaps this accounts for its widespread success in promoting development, as just documented. But it also has several disadvantages. First, it requires that the macroeconomic policy framework be sufficiently flexible and adaptable to the needs of undervaluation: a real exchange rate depreciation is possible only if the economy can generate an increase in saving relative to investment, which has obvious implications for fiscal and other policies (Rodrik 2009). Second, undervaluation does an imperfect job of targeting modern economic activities: traditional primary products receive a boost in profits alongside new industrial activities. And third, undervaluation is not just a subsidy on the production of tradables; it acts also as a domestic tax on their consumption (it raises the relative price of imported goods). That is why it produces an excess supply of tradables—a trade surplus. The last point is of special relevance to the subject of this paper, and I will return to it below.

Finally, there was an important *external* element that enabled the postwar growth miracles to take place. The advanced nations of the world, and the United States in particular, essentially had an attitude of benign neglect towards the policies in the developing world that made the industrial transformation possible. The GATT system placed very few restrictions on developing countries. The disciplines were few and far in between on trade policies, and non-existent on subsidies and other industrial policies. The IMF could be tough when it came to conditionality on monetary and fiscal policies—but only in instances where countries faced

external deficits (and had *overvalued* currencies). There was no presumption in favor of financial liberalization or capital-account opening, since many of the advanced economies themselves retained financial controls well into the 1970s. Consumers in the U.S. were happy to absorb the excess supply of tradables on the world market, even at the cost of rising borrowing from abroad.

The global environment became less permissive over time. Unlike its predecessor, the World Trade Organization (WTO) placed severe restrictions on the conduct of industrial policies in middle-income developing countries. Financial liberalization and capital mobility became the norm, with developing countries expected to converge towards “best-practice” in these areas (although, it became recognized, in the aftermath of the Asian financial crisis, that too rapid liberalization may be undesirable). Finally, the U.S. trade deficit with China and the undervaluation of the Renminbi became serious issues, with the IMF charged to carry out surveillance over “currency manipulation” (although in practice the effort led nowhere).

Despite these changes, until the present crisis the global context remained largely benign with respect developing countries’ need to diversify into industrial products in order to accelerate their growth. It is much less clear that we will be able to say the same about the environment going forward.

### III. What will be different after the crisis?

It is a safe bet that financial stability in the U.S. and other advanced countries will be eventually restored one way or another. Given the magnitude of the crisis, however, its residue is likely to linger for quite a while. In particular, the developed world may not recover quickly, and their growth may remain low or non-existent for some years to come. Japan’s stagnation

following its crisis in the early 1990s—after a period of very high growth—provides one worrisome antecedent. It is difficult to know whether U.S. and Europe will replicate this experience, but it is certainly impossible to rule the possibility out.

While slower growth in the advanced countries would be bad news, its implications on the developing world would be largely indirect. When rich nations grow more slowly (or not at all) the stock of knowledge and technology which is available to firms in poor countries is not reduced. The potential for productivity enhancement and catch-up remains fully in place. From an economic standpoint, the rate of growth of developing countries depends not on the speed at which rich countries grow, but on the difference between their and rich nations' income levels—i.e., the “convergence gap”. The former does affect the latter, but only slowly and over time.

The indirect effects operate through the channels of international trade and finance. Three likely developments here are of potential concern: (i) reduced appetite for cross-border lending; (ii) slower growth in world trade; and (iii) less tolerance for large external trade imbalances. I will discuss each in turn.

(i) Reduction in cross-border lending

Weaknesses in the financial markets of developing nations had little to do with the emergence of the financial crisis of 2008. Nevertheless, since it will take some time for the trend towards deleveraging and flight to safety to reverse itself, it is reasonable to expect that there will be some predictable, negative effects on capital flows to developing countries.

Whether one thinks this is a big deal or not depends on one's views about the growth process in developing nations. If we believe that the binding constraint to growth lies on the saving side, then we would conclude that a reduction in net inflows comes with a significant

growth penalty. This would be the conventional inference drawn from the neoclassical growth model and the presumption that private returns to investment are higher in poor nations than in rich nations. But the experience of the last few decades gives us ample reason to take this view with a heavy grain of salt. The presumption that the saving constraint binds in most poor nations is contradicted by one important stylized fact: high-growth and net capital inflows are negatively (rather than positively) correlated across developing countries. This was demonstrated in an important paper by Prasad, Rajan, and Subramanian (2007), whose central finding is shown in Figure 4. China, of course, is the best-known case of a high-growth country with a trade surplus, but as the Prasad et al. evidence shows, China's experience is not an anomaly. Rapidly growing countries are more likely to be net exporters of capital than net importers (and this is true even when aid flows, which tend to go disproportionately to the worse-off countries, are taken out).

This should not be surprise in light of the growth story I laid out in the previous section. The binding constraint in that interpretation is not the supply of loanable funds, but investment demand in tradables. What limits growth is not access to finance but the low (private) profitability of modern tradables. Accordingly, the key to growth is not more finance, but enhanced private profitability in tradables. Moreover, in typical second-best fashion, more finance can result in lower growth if it aggravates the more significant constraint. How? Through the effect of capital inflows on the real exchange rate. As shown in Prasad et al. (2007) and Rodrik (2009), countries with larger net capital inflows and more open capital accounts tend to have more overvalued currencies. This mechanism goes a long way to explain why financial globalization has proved so disappointing for the vast majority of developing nations (Rodrik and Subramanian 2009).

No doubt there are some countries for which low domestic saving is indeed a binding constraint. This constraint can be relaxed, in principle at least, through access to foreign finance. Brazil, for example, has built a diversified agricultural and industrial base (thanks in large part to industrial policies in earlier decades) but all indications are that investment levels in modern economic activities are currently constrained primarily by the high cost of capital driven by low domestic saving (Hausmann 2008). Turkey represents a similar case. So growth and investment in Brazil and Turkey go up and down with net capital inflows. However, since capital flows are highly volatile and subject to “sudden stops,” neither Brazil nor Turkey has been able to generate consistently high growth since the end of the 1980s. So even in saving-constrained cases such as these, the appropriate remedy lies not in resuscitating financial globalization, but in domestic policies (such as, in this instance, reductions in fiscal deficits and encouragement of private saving).

Neither is there much cause to be concerned about a reduction in global risk-sharing. In principle, higher levels of gross (two-way) flows allow countries to insure themselves against idiosyncratic risks. But here too, the evidence cuts the other way. Kose, Prasad, and Terrones (2007) find that consumption risk sharing has actually gone down in the developing world since the 1990s (while it has improved in the rich countries). One reason of course is the greatest prevalence of financial crises in a financially globalized world.

The bottom line is that developing nations should not shed too many tears if the world economy experiences some financial deglobalization. Countries that have been recipients of large capital inflows may even end up seeing their growth prospects improved, since they will now experience less pressure for real exchange rate appreciation. And fewer financial crises is nothing to get upset about.



(ii) Less buoyant world trade

Lower growth in the advanced countries also implies a lower rate of expansion of their import demand, which has implications for both prices and quantities in world trade.

On the price side, there are two relative prices that matter to developing nations—the terms of trade and the relative price of industrial goods—and they are likely to move in opposite directions. Consider first the terms of trade. The developed and developing worlds share one terms of trade, which are the inverse of each other. As long as domestic demand is slower to pick up in the developed world than in the developing world, which is my baseline assumption here, the terms of trade are likely to move in the rich countries' favor. This will constitute a net loss of real income to the developing countries, but it is unlikely to have much of a perceptible effect on their growth rates. To the extent that developing countries are able to continue to diversify into new products (of the type produced in the rich countries), they can avoid large terms-of-trade declines—as rapidly growing countries have in fact managed to do to date.

The second relative price of consequence is the price of industrial goods relative to primary goods on world markets. This is of independent interest to the developing countries, because it affects the relative profitability of their modern tradable sectors, and hence the speed which structural change and economic growth take place through the mechanisms I have already discussed. This relative price is not exactly the inverse of the rich countries' terms of trade, but it is likely to be negatively correlated with it (since developed countries are net industrial exporters and net commodity importers). Consequently, this particular channel presents some good news for the growth prospects of developing countries. Slower growth in the North reduces the prospects of a Dutch disease in the South.

What about the quantity effects? We normally associate a slower pace in export volumes with lower economic growth, but upon closer look the causal effect from the former to the latter is not at all clear. In the very short run, there may be positive Keynesian effects from export demand. But it is hard to believe that exports can act as an engine of growth for Keynesian, excess-capacity reasons over the medium- to longer-run. And if they could, developing nations could simply substitute fiscal stimulus and get growth that way!

For export quantities to matter over the longer run, one must believe either in learning or other spillovers from exports, which have been hard to document, or in the story I laid out above, in which tradables are special because that is where the higher productivity activities are. The two accounts differ on the importance they attach to the act of exporting per se. The “spillovers-from-exporting” story relies on the technological or marketing externalities that are created when a tradable good crosses an international boundary. The “tradables-are-special” story is indifferent to whether international trade actually takes place or not.

In Table 2 I report the results of regressions where the two hypotheses are allowed to compete against each other. Each column is a regression estimated with fixed effects for countries and time periods, using a panel of five-year subperiods. The regressors, in addition to the fixed effects, are lagged income (to account for convergence), the share of industrial value added in GDP, and the share of exports in GDP. In order to allow comparison of the estimated coefficients on the industry and export shares, I have standardized these indicators. So the coefficient tells us the estimated effect of a single standard-deviation change in the relevant variable.

The first column runs the regression on the entire post-1960 sample for which there is data. Industry and export shares are both statistically significant, but the estimated impact of

industrial activity is more than twice as powerful: a one standard-deviation increase in industrial shares is estimated to increase growth by 1.6 percentage points, while the corresponding increase in export shares boosts growth only by 0.7 percentage points. Moreover, it turns out that the result with export shares is not robust. When the sample is restricted to post-1990 data (column 2), the estimated coefficient on exports becomes insignificant. And the difference in the magnitudes of the effects rises to a factor of between 4 and 5 (0.028 versus 0.006). When a few observations corresponding to countries with very high export shares (e.g., Luxemburg and Hong Kong) are excluded, the significance of the export variable is reduced further (column 3). Perhaps most importantly, when we restrict the sample to developing countries, the coefficient on the export share turns slightly negative (and is statistically insignificant), while the coefficient on the industry share rises (to 0.020) and remains strongly significant (column 4). The horserace between industrial activity and export orientation has a clear winner.

As long as what matters is industrial (and other non-traditional) output, an increase in world trade can in fact even be a mixed blessing for many developing countries. Leaving aside the presence of large trade imbalances, to which I will turn in the next section, growth in exports implies growth in imports. If the former add to demand for domestically-produced tradables, the latter subtract from it. A *balanced* increase in international trade creates no additional net demand for domestic tradables. If imports are dominated by industrial products, as is the case in many developing nations, a large expansion of trade can even be bad for domestic industrial output.

The experiences of various groups of developing countries have differed in this respect. For countries like China and many other low-cost suppliers of manufactures, which were rapidly diversifying into industrial products and became large importers of primary commodities, the

expansion of global trade was an unambiguous benefit for their industrial sector. But many other countries found their industrial sectors coming under severe competition from precisely these low-cost sources. Countries ranging from Ethiopia to Mexico found their manufacturing firms getting squeezed by imports.

Whether the depressed returns to import substitution were more than offset by the higher returns from exporting (and thus industrial activity affected positively on net on account of trade) depended very much on the nature of other economic policies in place. The evidence seems to indicate that the large-scale entry of China and other low-cost producers in world markets affected middle-income countries particularly adversely. This is shown in Figure 5, which displays the relationship between income levels and industrial activity in the periods before and after 1990. This relationship is quite (log-)linear in the earlier period, but becomes visibly concave after 1990. What the picture makes clear is that countries at low income levels were able to support much higher levels of industrial activity after 1990 compared to earlier periods, while the opposite was true for countries at medium- and higher-level of incomes. What was an enabling environment for China and India was not nearly as hospitable to Mexico or Brazil.

The bottom line is that reduced buoyancy in world trade is of smaller consequence to the growth of developing nations than is usually imagined. What matters for growth is the ability to expand industrial economic activities, not trade per se. Industrial activity can increase without increasing trade, if domestic demand rises alongside. The kind of policy changes needed to achieve this outcome will be discussed below.

(iii) Smaller current account imbalances

Finally, industrial nations are likely to tolerate smaller current account imbalances, both as a consequence of lower growth and because of the lesson from the crash of 2008 that large imbalances portend trouble down the road. So countries with large trade surpluses—anything around or over 5 percent of GDP—are likely to come under pressure to adjust their currency and macroeconomic policies, especially if these countries are large and systemically important.

As a matter of accounting, a trade surplus is a source of net demand for a country's tradables. So we do expect trade surpluses and growth to go together, especially in countries which are diversifying into "modern" tradables such as industrial products. This is an important reason behind the negative, rather than positive, association between net capital inflows (= current account deficits) and growth, noted above. So might the lower tolerance of current account surpluses from larger developing countries act as a serious constraint on their growth potential in years ahead?

Once again, we need to remember that the key to growth is the domestic output of modern tradables, and not the excess supply thereof. Systematic evidence on this is provided in Table 3, which presents the results of another horserace, this time between industry shares and trade surpluses. The main result is that, once industry shares in GDP are controlled for, trade surpluses exert no additional positive effect on economic growth. This is true for the full sample (column 1), for post-1990 data (column 2), for samples in which large trade deficits or surpluses have been removed (column 3), and for samples restricted to developing countries (column 4). In each one of these runs, the industry variable is highly significant while the trade surplus is not.

The implication for developing nations that have gotten hooked on trade surpluses as their "engines of growth" should be clear: there is no need to sacrifice growth as long as domestic demand for tradables can be increased alongside the domestic supply. Undervaluation

of the currency may be out. But there are other policy options, as I discuss in the next section, which can spur both the consumption and production of tradables.

#### IV. Promoting industrialization without trade surpluses

Let us return to the interpretation underlying the growth dynamics that I sketched out above. In this model poor countries are poor because too few of their resources are in modern, high productivity activities. Fast growth happens when there is rapid structural transformation from low-productivity traditional sectors to high-productivity modern activities. The reason this transformation is not an automatic, market-led process is that there are severe market or institutional failures whose costs are borne disproportionately by the modern sectors. Sometimes transformation is blocked because of low domestic saving and high cost of capital, which keep investment and structural change sluggish. But more typically the problem is a large wedge between private and social returns in modern sectors. These sectors are subject both to learning spillovers and coordination failures and to high costs imposed by weaknesses in legal and regulatory institutions. These weaknesses are hard to remove in short order, and the experience of advanced economies is that they are addressed only through the long course of decades, if not centuries.<sup>3</sup>

So while it would be desirable to address these shortcomings directly, by removing market failures and fixing institutions, as a practical matter such an agenda is too broad and ambitious and hence too unrealistic. As noted previously, successful countries have pursued growth strategies that alleviate these constraints indirectly, by raising the relative profitability of

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<sup>3</sup> This need not be the case always, of course. Some government imposed constraints (“red tape”) are easier to fix than others (e.g., inefficient courts).

modern activities through other means. What all these strategies have in common is that they act as *subsidies* on tradables.

Once we strip these strategies to their essence, it becomes easier to understand what is central and what is incidental to their working. In particular, we can see that a strategy of subsidizing tradables need not be associated with undervalued exchange rates and trade surpluses.

The point can be made with the help of Figure 6, which shows the equilibrium in the market for tradables. The supply of tradables is increasing in the relative price of tradables ( $R$ , the real exchange rate), while the demand is decreasing. Start from an initial equilibrium ( $R^0$ ,  $Q^0$ ) where there is no excess supply of tradables and therefore the trade balance is zero (Figure 6(a)). Now suppose the government imposes a production subsidy on tradables. This shifts the supply schedule for tradables out, since for any level of  $R$  producers of tradables are now willing to supply a larger amount (Figure 6(b)). Where will the new equilibrium be? If we assume that the real exchange rate remains at  $R^0$ , the subsidy would produce not only an increase in the output of tradables but also a trade surplus (an excess supply of tradables).

But as is shown in Figure 6(c), this is not necessarily the final equilibrium. Unless the government adopts additional macroeconomic policies to maintain the real exchange unchanged, there will be an endogenous appreciation of the real exchange rate to  $R^2$ , which spurs domestic consumption of tradables and brings the trade balance back to zero (Figure 6(c)). Note that in this final equilibrium, the output of tradables still ends up being higher even though the real exchange rate has appreciated and the trade balance has been re-established. That is because the real exchange rate appreciation needed to bring the trade balance back to zero is (proportionately) less than the magnitude of the initial subsidy since, unlike the subsidy, it affects

both the consumption and production margins. Therefore it does not fully undo the effect of the subsidy on the supply side. The full details are worked out in an explicitly general-equilibrium framework in the Appendix.

As this analysis demonstrates, it is possible to enhance production incentives for tradables, and do so by as wide a margin as is necessary, without creating spillovers to the rest of the world in terms of trade imbalances. Unlike currency undervaluation (which taxes domestic consumption of tradables), a policy of explicitly subsidizing tradables (combined with macroeconomic policies that maintain external balance) boosts the domestic consumption of tradables.

What form should this subsidy take in practice? In the rest of this section, I will discuss three approaches for increasing the effective producer price of tradables: (a) industrial policies; (ii) reducing input costs for tradables; and (iii) incomes policies. All of these pose practical policies in implementation, so the appropriate mix will depend on the circumstances of each country.

(i) Industrial policy

In principle, industrial policy is ideally suited to the problem at hand. What needs to be done is to enhance the relative profitability of non-traditional products that face large information externalities or coordination failures, or which suffer particularly strongly from the poor institutional environment. That is what good industrial policy attempts to do. Tax exemptions, directed credit, payroll subsidies, investment subsidies, export processing zones are some of the forms in which industrial policy gets implemented. What is distinctive about these policies is that they target specific firms or sectors, and therefore privilege some at the expense



of others. That is what makes industrial policy controversial of course. But as long as the targeting is done broadly well—as long as it focuses on new activities at the outer margins of a country’s underlying competence—the potential upside is large. The advantage of industrial policy relative to currency undervaluation is precisely that it allows greater fine tuning and discrimination: traditional tradables (such as primary products and industrial products in which a country has already established itself) need not be subsidized, and the consumption of tradables need not be taxed (as explained previously).

There is still a sense in which subsidies on modern tradables can spill across borders. Even if the net supply of tradables does not increase in aggregate, the net supply of those that are targeted for promotion will. Other developing countries will be in the receiving end of this, and if they remain passive, their own industrialization incentives will be blunted. But the right way of expressing this problem is to say that the use of “optimal” industrial policies in some countries increases the costs of not using such policies in others. As some countries alleviate their market imperfections, the costs of not dealing with these imperfections get exacerbated elsewhere. So as long as all countries are following industrial policies that are optimal from their perspective, there are no spillovers to contend with. The spillovers in question can be effectively neutralized as long as other developing countries are following appropriate industrial policies as well.

The two chief arguments against industrial policy are that governments can never do the requisite targeting properly since they lack sufficient information, and that even if they could, the process would become rife with rent-seeking and corruption. There are good counter-arguments to both objections (Rodrik 1997a chap. 4 and 1997b). First, it makes little sense to hold the conduct of industrial policy to the unrealistic standard that governments always be able to pick the winners. In view of the uncertainties involved, mistakes are not only unavoidable; they are

part and parcel of optimal program design: if the government never makes any mistakes, it is as good an indicator as any that it is not ambitious enough. The much more meaningful and desirable requirement is that governments be able to recognize their mistakes and change course when needed. That is obviously a much weaker desideratum than omniscience. And it can be achieved through appropriate institutional design (see Rodrik 1997a chap. 4).

With respect to corruption, that is a real danger of course. But industrial policy is hardly the only area of government policy which is susceptible to corruption. Education policy and tax policy, to name just a couple of other areas, are equally at risk. Yet we never advise governments that they should give up on collecting taxes or that they should not finance education and build schools. Instead, we try to think of ways in which these systems can be rendered less susceptible to corruption and rent-seeking. There is no reason why industrial policy should be any different. Once again appropriate institutional design holds the key to better implementation.

The main external obstacle to the wider use of industrial policies by the larger developing countries is the WTO's Agreement on Subsidies. This Agreement prohibits the use of subsidies which take the form of fiscal expenditures conditioned on export performance. More seriously, it also renders "actionable" the use of subsidies that have the effect of increasing exports, even if they are not directly conditioned on exports. (Least developed countries are exempt from these rules.) A literal application of this standard would rule out many kinds of industrial policies, the objective of which is precisely to increase the domestic supply of tradables. Only subsidies that encouraged import substitution would remain exempt.

In practice, of course, there are many loopholes and one can debate the extent to which this and other WTO agreements actually restrict the space for industrial policies (Rodrik 2007,

chap.4). But it is also the case that the restrictiveness of the Agreement on Subsidies has not been put to a real test. As long as countries were free to use currency policies to encourage industrialization, the WTO constraint did not bind all that much. So China could hugely subsidize its tradables through an undervalued renminbi while abiding (barely) by WTO rules on subsidies or local content.

In a world where economic growth requires the encouragement of modern economic activities in developing nations, the Agreement on Subsidies makes little economic sense.<sup>4</sup> It rules out a desirable second-best policy for promoting economic diversification and structural change. It has the unintended consequence of inducing governments to favor an inferior policy (in view of its spillovers into trade imbalances), namely undervalued currencies. Worse still, it may encourage trade protection as a defensive measure against industrial imports. If we want greater international oversight on currency practices, as I think we should, we will need to substantially relax discipline over industrial subsidies.<sup>5</sup>

(ii) Reducing input costs for tradables

A second type of government policy which can shift relative incentives in favor of tradables is to reduce the costs of inputs which are used intensively by modern economic activities. Certain types of specialized industrial or professional skills (e.g., machinists or call-

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<sup>4</sup> There is a good case to be made that the prohibition on subsidies has little economic rationale, independently from the developmental argument I am making here. After all, subsidies are trade creating (unlike import barriers), and a country that subsidizes its tradables provides the rest of the world an economic “gift” to the extent that the subsidy results in greater supply and lowers world prices. The WTO’s approach to subsidies is mercantilist and overly influenced by the interests of competing producers.

<sup>5</sup> Oversight over currency practices is usually thought of as being the province of the IMF. But Mattoo and Subramanian (2008) have argued that the WTO is a much more suitable organization for this purpose since what’s at stake are imbalances in trade flows and the WTO actually has the capacity to make its rulings stick. The discussion here suggests that any move in this direction should have as a direct quid pro quo the weakening of the discipline on subsidies.

center operators) fit the bill well. Government investment in training in such areas will have the effect of incentivizing modern tradables (and do so in most cases without threatening conflict with the WTO). While straightforward in theory, however, this approach also faces some practical obstacles. The difficulty is that many of the most obvious strategies one can think of produce asymmetric effects across different groups of tradables.

So consider for example what is perhaps the most immediate policy that comes to mind: reducing trade costs in the form of transport and logistics costs. Such costs can be a significant deterrent to trade, which is why many governments are so keen to invest in trade infrastructure (modernization of ports and improving transport). But the effects of this on industrial incentives are ambiguous, for the same reason that trade liberalization yields uncertain dynamic gains. A reduction in trade costs helps export activities; but it also hurts import-substitution activities, because it takes some “natural protection” away from them. The net result depends on whether more new, dynamic activities are crowded in than are crowded out. It cannot be determined a priori without some careful prospective analysis.

Or consider reducing tariffs on intermediate inputs. This will be good for all final goods producers, but no so good for competing intermediate-good producers at home. The net effect is once again indeterminate.

(iii) Wage restraint

The single most important non-traded input in the modern sector is labor. Developing countries typically have segmented labor markets, where formal-sector wages may differ significantly from wages in informal activities and the rural sector. In such settings, the institutional and regulatory setting exerts a large influence on the determination of the wages

most relevant to modern sector firms. Consequently, changes in these arrangements can have a correspondingly significant effect on the relative profitability of modern tradable activities.

In societies where there exists a habit of cooperation among social partners, it may be possible to negotiate wage restraint in the formal parts of the economy in return for the expectation of continued job creation. Unions which are able to think long-term and internalize the interests of their future as well as present membership may be persuaded to moderate wage demands.

Unfortunately, such social pacts are more common in advanced economies with centralized wage bargaining (such as Sweden, Austria, or Ireland) than in developing ones (e.g., Mauritius). When they are set up, it is typically as a temporary arrangement to deal with a severe macroeconomic crisis (e.g., Mexico in 1987, South Korea in 1997). Institutions of conflict management are weak in developing countries, along with all other institutions. For the vast majority of developing nations, therefore, this is no easy alternative to explicit industrial policy.

## V. Concluding remarks

How hospitable will the global environment be for economic growth in the developing world as we come out of the present financial crisis? The answer depends, I have argued, on how well we manage the following tension. On the one hand, global macro stability requires that we prevent external imbalances from getting too large. On the other hand, growth in poor nations requires that the world economy be able to absorb a rapid increase in the supply of tradables produced in the developing world.

For many small developing countries, undervaluation of their currency remains a viable industrialization strategy, although it is not even second-best for reasons I have discussed above.

Given their small footprint in world trade, it is unlikely that they will make a large appearance on the radar screen of surveillance over “currency manipulation practices.” But middle-income and large developing nations have to transition into alternative strategies. They will have to contemplate—and the rest of the world will have to allow them—the use of various explicit industrial promotion measures for non-traditional tradables, including subsidies. Combined with real exchange rate appreciation, such subsidies would boost the supply of non-traditional goods, but be neutral with respect to the trade balance. In effect, industrial policy can be assigned to the structural transformation target while the exchange rate is assigned to the external balance.

Removing the real exchange as a tool for development does represent a cost to the larger developing countries. But failure to realize that there are alternative approaches that can be used as substitutes would greatly magnify the adverse effects on growth.

If the need for such a strategy is not recognized and trade rules on subsidies are enforced blindly, we are likely to find ourselves in a period of great tension in international economic relations. This tension will exhibit itself not only as a North-South divide, but also as a cleavage within the developing world. As the relative size of advanced economies and their markets shrinks, manufactured exports from low-cost suppliers will spill over into the markets of middle income countries with greater force. If the latter do not have their own industrial promotion and diversification strategies, they will come under strong pressure from domestic industry to react in a defensive manner, by erecting protectionist barriers against imports from other developing countries. Restricting the policy space on industrial policies will have the unintended consequence of fostering trade protection.

So there is room for guarded optimism with regard to the prospects for developing nations. The good news is that developing countries can continue to grow rapidly even if there is

some slowdown in world trade and there is reduced appetite for capital flows and trade imbalances. The bad news is that the favorable outcome will not happen on its own, as a result of the magic of market forces. As we reform global rules and re-design domestic strategies, we need to ensure that the environment will be as conducive to structural transformation in the developing world as it has been during the last fifty years.

Appendix: Production subsidies on tradables in general equilibrium

We divide the economy into two sectors, producing tradable and non-tradable goods respectively. Let us take the price of non-traded goods to be the numeraire, and fix it to  $1$ . The demand side of the economy is represented with the expenditure function  $E(R, 1, u)$ , where  $u$  stands for aggregate utility and  $R$  is the (relative) price of tradables and the real exchange rate. The supply side of the economy is represented by a GDP or revenue function given by  $G(R, I)$ , where  $I$  have repressed the factor endowments of the economy since they will be taken to be in fixed supply throughout.

We are interested in the effects of a production subsidy on tradables,  $s$ . The direct effect of such a subsidy is to increase the supply price of tradables, so the GDP function is re-written as  $G(R+s, I)$  while the expenditure function remains unchanged.

Equilibrium in this economy can be expressed using three equations. Note first that the partial derivative of  $G(\cdot)$  with respect to the price of tradables (expressed as  $G_I(R+s, I)$ ) gives us the supply of tradables,  $Q_T$ .

$$(1) \quad Q_T = G_I(R+s, I)$$

The second relationship is an expenditure equals income identity:

$$(2) \quad E(R, 1, u) = G(R+s, I) - s G_I(R+s, I) .$$

We assume that the subsidy is financed through lump-sum taxes, so the income available for private-sector consumption is GDP minus the tax revenue needed to finance the subsidy. The last term in equation (2) is the corresponding tax revenue. Finally, we express equilibrium in the market for tradable goods:

$$(3) \quad E_I(R, 1, u) = G_I(R+s, I) ,$$



where  $E_I(\cdot)$  is the (Hicksian) demand for the tradable good. By Walras' Law, (2) and (3) guarantee that the market equilibrium for non-traded goods holds as well. These three equations determine the three endogenous variables in the system,  $Q_T$ ,  $R$ , and  $u$ .

From (1), it is evident that the output of the tradable good depends exclusively on what happens to its supply price,  $R+s$ . If this price increases in response to an increase in the subsidy, the supply response will be positive.

Performing the comparative statics of the system yields the following result:

$$\frac{d(R+s)}{ds} = \left[ \frac{E_{11}(\cdot)}{E_{11}(\cdot) - R_{11}(\cdot)} \right] \left[ 1 - s R_{11}(\cdot) \frac{E_{1u}(\cdot)}{E_u(\cdot)} \right]^{-1}$$

To interpret this expression, focus first on the case where the subsidy is "small" and we evaluate the expression at  $s=0$ . Since  $E_{11}(\cdot) < 0$  and  $R_{11}(\cdot) > 0$  from the properties of expenditure and revenue functions,  $d(R+s)/ds$  is unambiguously positive in this case, which is to say that the appreciation of the real exchange rate does not fully undo the incentive effects of the subsidy.

In the case where  $s$  is not zero or very small to begin with, income effects come into play, as captured by the last term in the expression. Since  $R_{11}(\cdot) \frac{E_{1u}(\cdot)}{E_u(\cdot)}$  is positive, the second bracketed term cannot be signed in general. But it is conventional to assume, as part of a stability requirement, that this term is not larger than 1, so that  $d(R+s)/ds$  remains positive.

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**Table 1: How undervaluation drives growth through its impact on industrial activity  
(panel of 5-year sub-periods, 1960-2004)**

	Dependent Variable			
	(1) Industry share in GDP	(2) Industry share in employment	(3) Growth - TSLS	(4) Growth - TSLS
<i>ln current income</i>	0.079** (9.99)	0.025 (1.51)		
<i>ln initial income</i>			-0.134** (-8.33)	-0.071** (-4.39)
<i>ln UNDERVAL</i>	0.024** (3.62)	0.042** (4.87)		
<i>Share of Industry in GDP</i>			1.716** (7.59)	
<i>Share of Industry in employment</i>				1.076** (6.15)
Time dummies	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	985	469	938	459

Notes: Industry and agriculture shares in GDP are in constant local currency units. In columns (5) and (6), industry shares are regressed on *ln UNDERVAL*, *ln income*, and lagged *ln income* in the first stage.

\*\* Significant at 1% level

\* Significant at 5% level

**Table 2: Exports and industrial output as determinants of growth  
(panel of 5-year sub-periods, 1960-2004)**

	Dependent Variable: growth in per-capita GDP			
	(1) full sample	(2) post-1990 sample	(3) post-1990 sample, export outliers removed	(4) developing country sample
<i>ln initial income</i>	-0.043** (-7.98)	-0.125** (-8.56)	-0.125** (-8.32)	-0.045** (-5.57)
<i>Share of Industry in GDP</i>	0.016** (4.54)	0.028** (3.57)	0.028** (3.53)	0.021** (4.06)
<i>Share of Exports in GDP</i>	0.007** (2.67)	0.006 (1.69)	0.006 (1.49)	-0.001 (-0.34)
Time dummies	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	850	417	410	527

Notes: Industry and export shares are standardized variables.

Column (3) excludes observations where exports shares exceed 100%.

Column (4) excludes observations with per-capita GDP > \$6,000.

\*\* Significant at 1% level

\* Significant at 5% level

**Table 3: Trade surpluses and industrial output as determinants of growth  
(panel of 5-year sub-periods, 1960-2004)**

	Dependent Variable: growth in per-capita GDP			
	(1) full sample	(2) post-1990 sample	(3) post-1990 sample, trade surplus outliers removed	(4) developing country sample
<i>ln initial income</i>	-0.041** (-7.89)	-0.126** (-8.90)	-0.122** (-8.32)	-0.045** (-5.58)
<i>Share of Industry in GDP</i>	0.018** (4.79)	0.029** (3.75)	0.041** (4.39)	0.021** (3.97)
<i>Trade Surplus as percent of GDP</i>	-0.002 (-1.25)	0.003 (1.02)	-0.007 (-1.19)	-0.002 (-1.17)
Time dummies	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	850	417	359	527

Notes: Industry share and trade surplus are standardized variables.

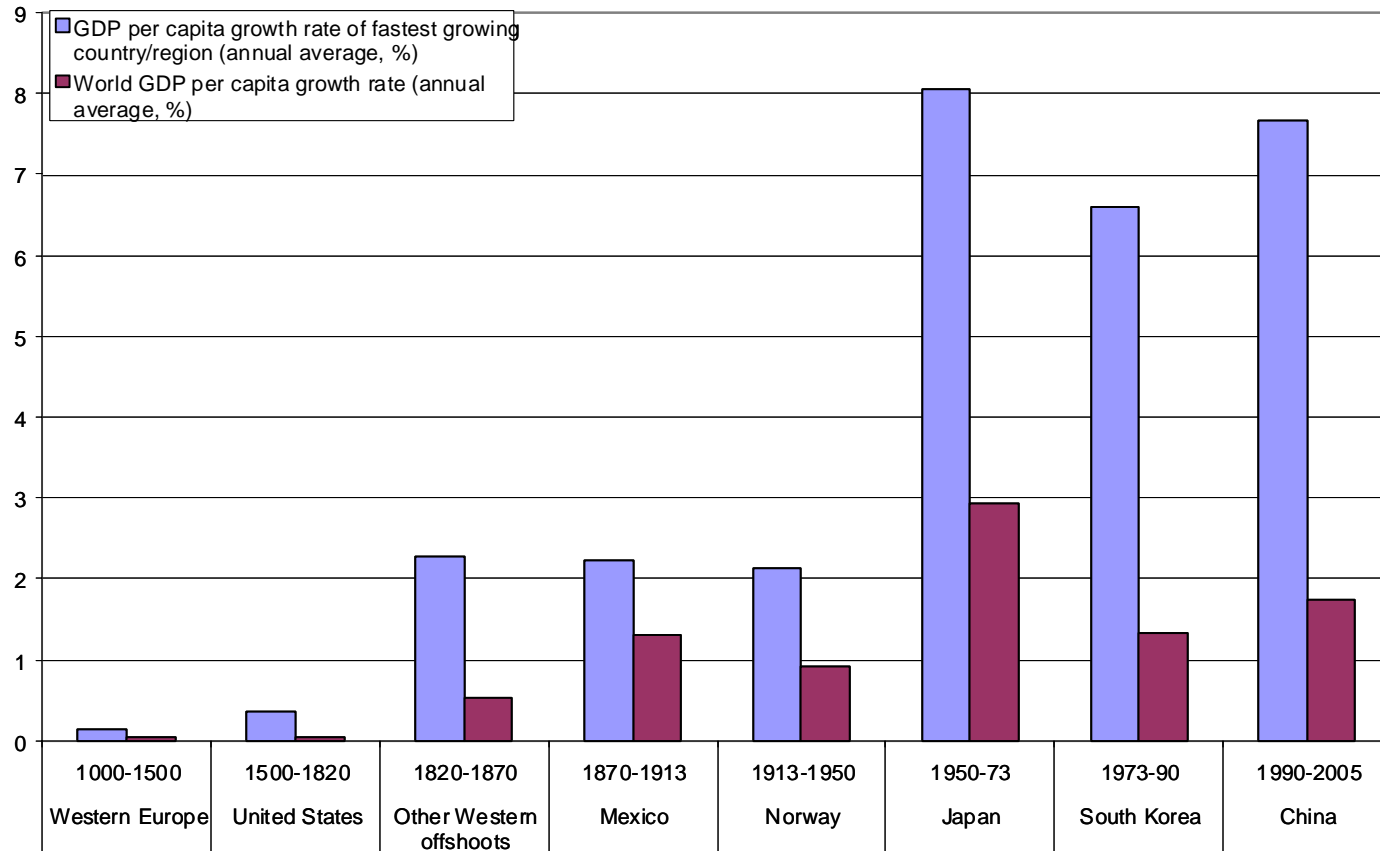
Column (3) excludes observations where the absolute value of the trade surplus exceeds 20% of GDP.

Column (4) excludes observations with per-capita GDP > \$6,000.

\*\* Significant at 1% level

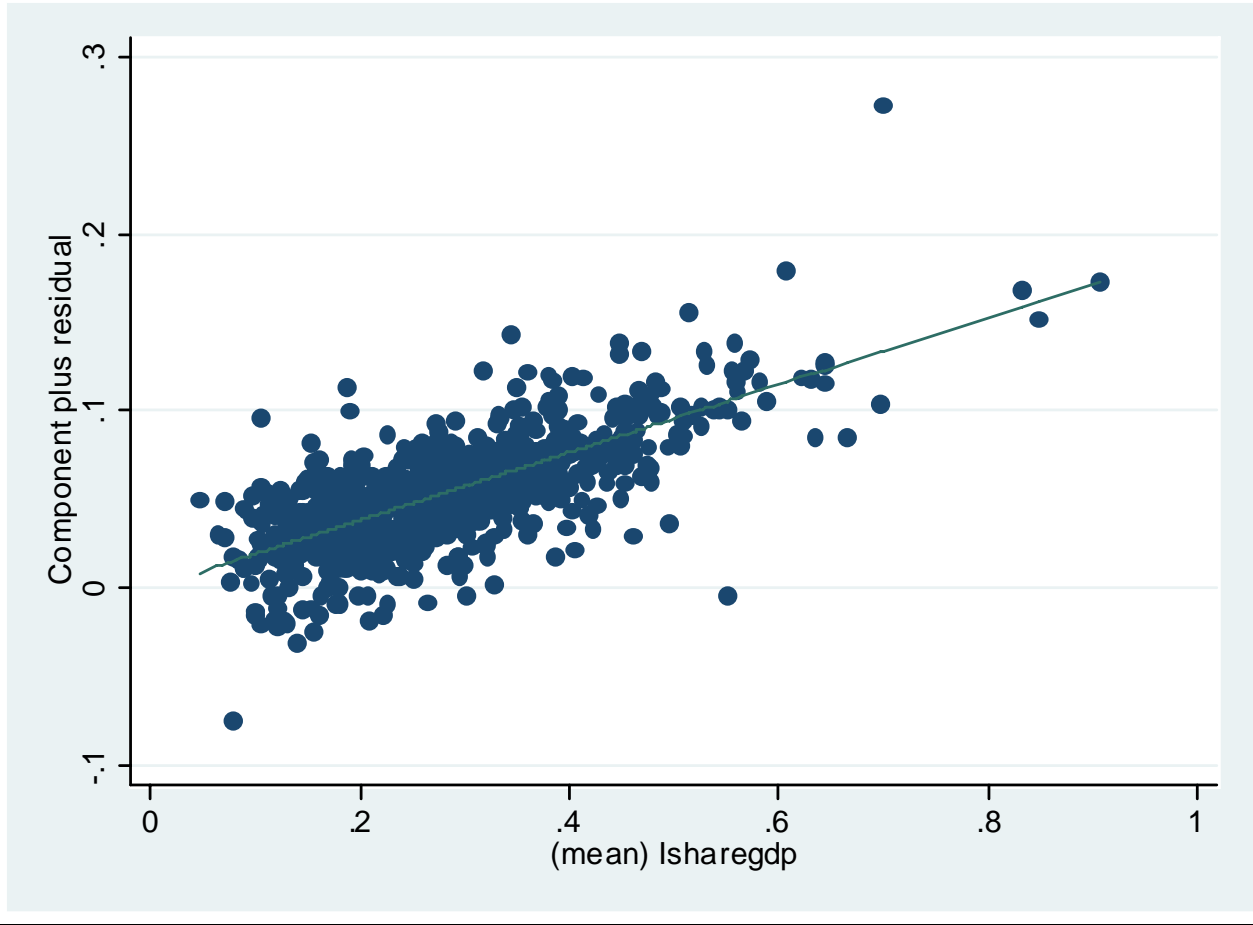
\* Significant at 5% level

### Historical experience with growth



Source: Maddison (2001) and World Bank, World Development Indicators.

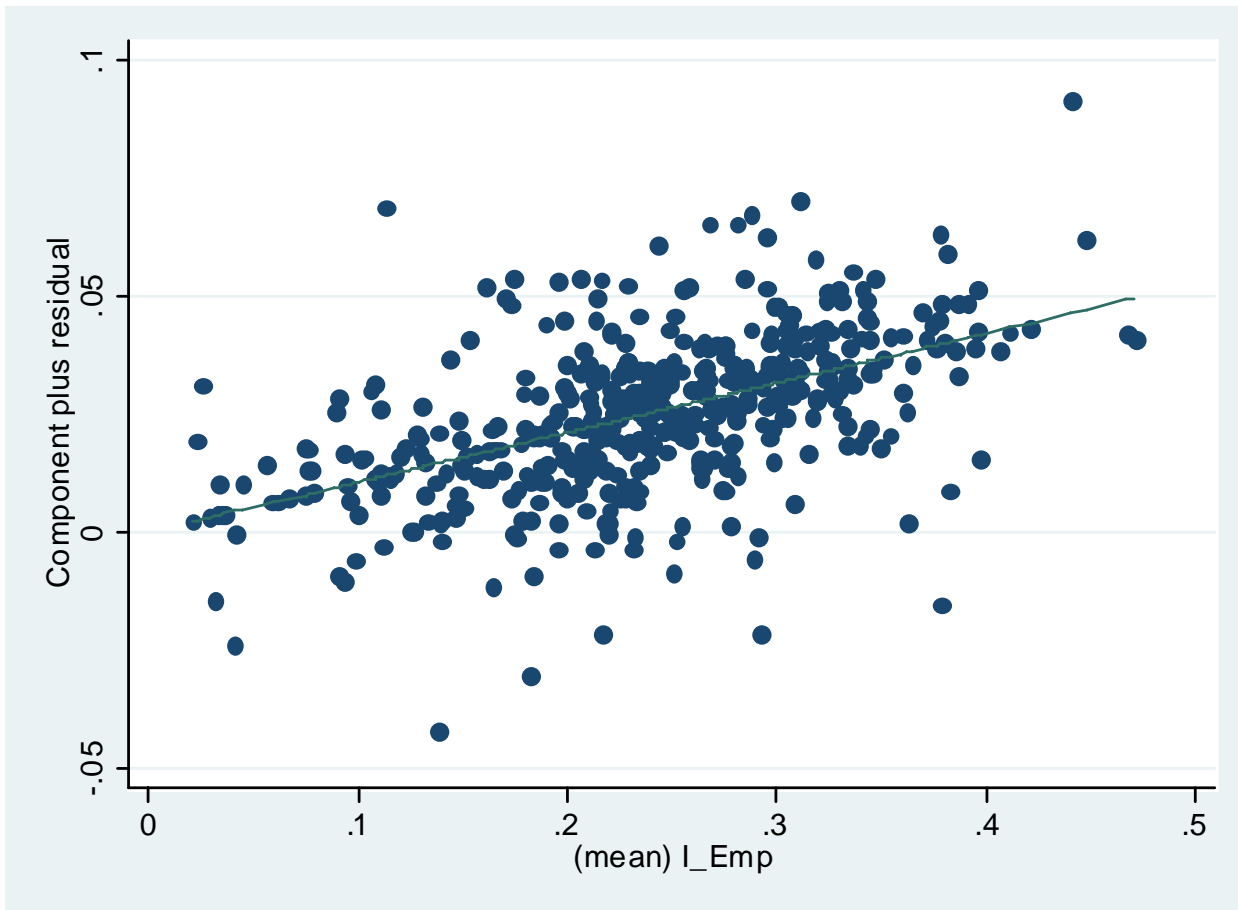
Figure 1: The expanding growth frontier



Source: Author's calculations using data from World Bank, World Development Indicators and Penn World Tables.

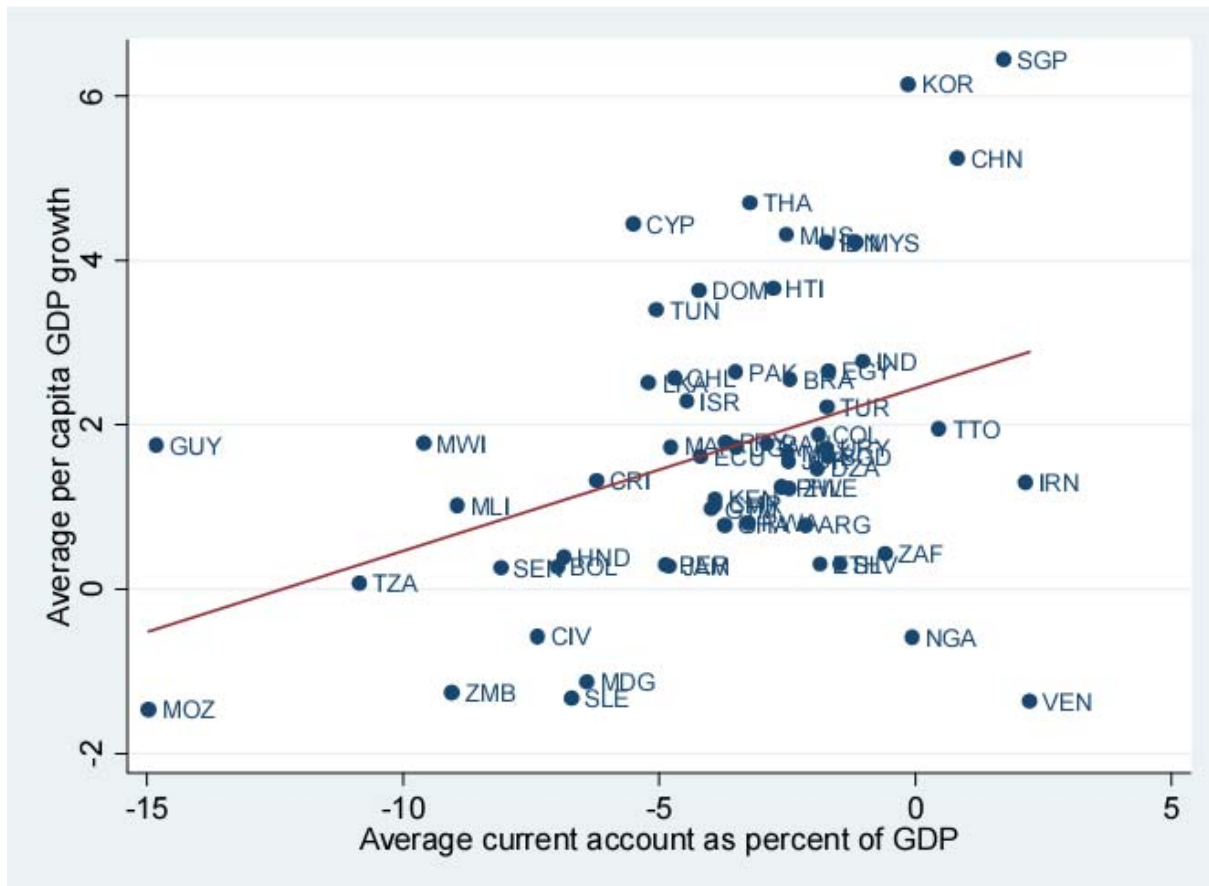
Figure 2: Relationship between industrial share in GDP (horizontal axis) and economic growth (vertical axis). Each point in the chart corresponds to a 5-year subperiod during 1960-2004 for a specific country. The growth rates control for initial income levels and country and period fixed effects.





Source: Author's calculations using data from World Bank, World Development Indicators and Penn World Tables.

Figure 3: Relationship between industrial employment shares (horizontal axis) and economic growth (vertical axis). Each point in the chart corresponds to a 5-year subperiod during 1960-2004 for a specific country. The growth rates control for initial income levels and country and period fixed effects.



Source: Prasad, Rajan, and Subramanian (2007)

Figure 4: Net capital outflows and growth

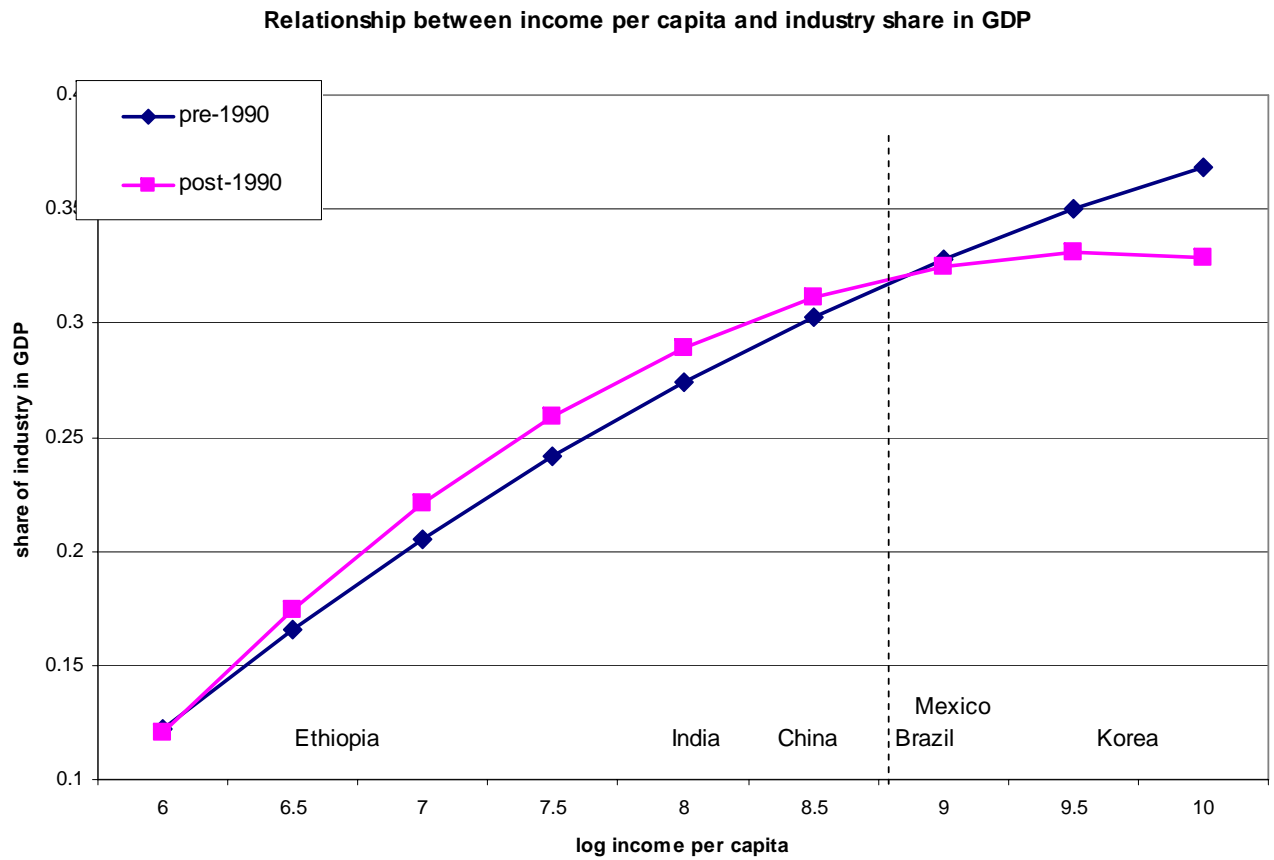


Figure 5: The income gradient of industrial shares in GDP

Note: Relationship is based on a quadratic fit.

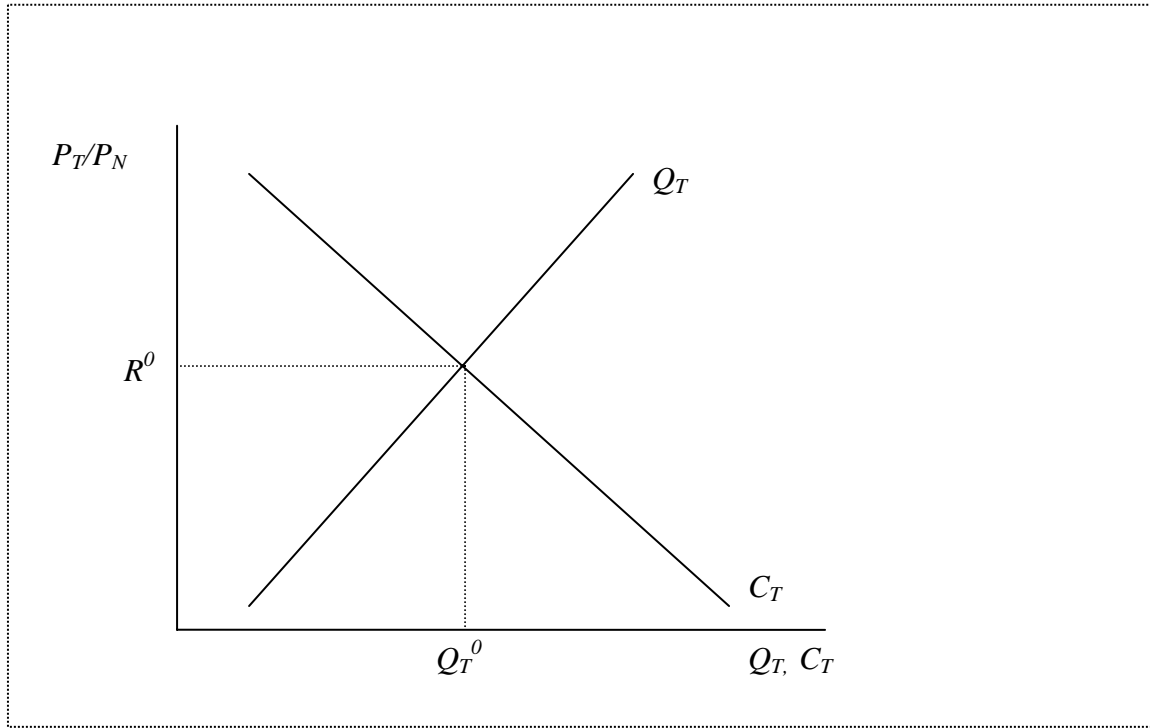


Figure 6(a)

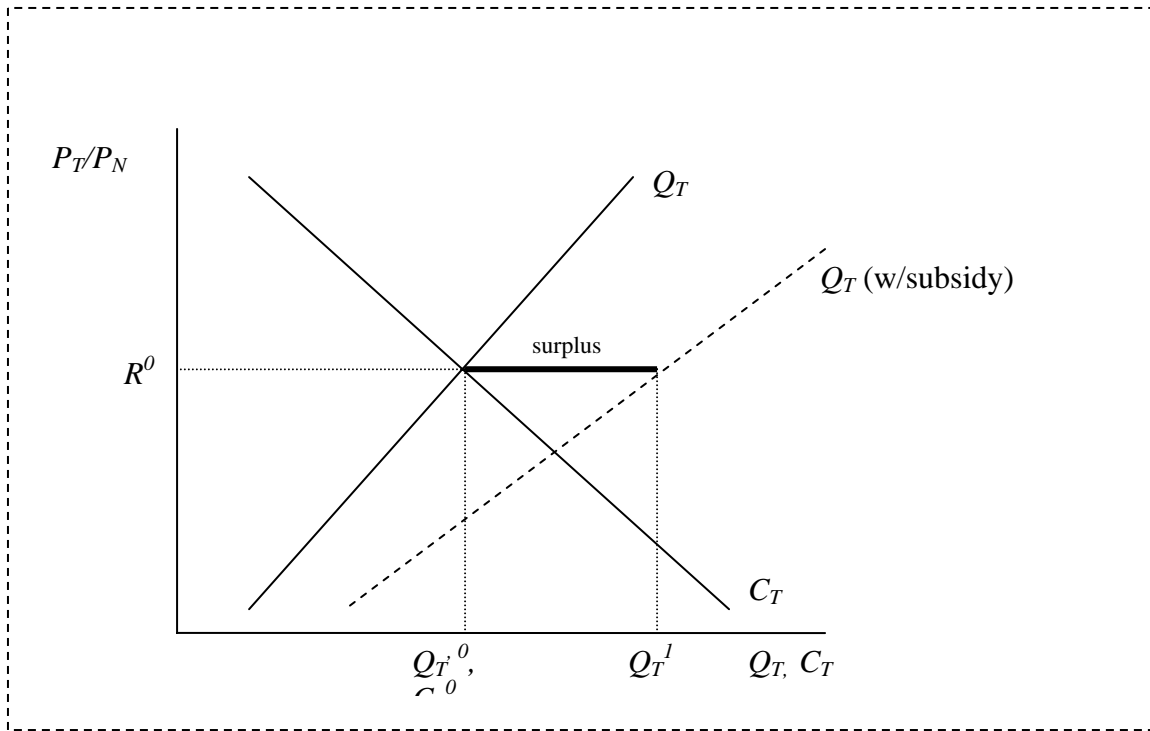


Figure 6(b)

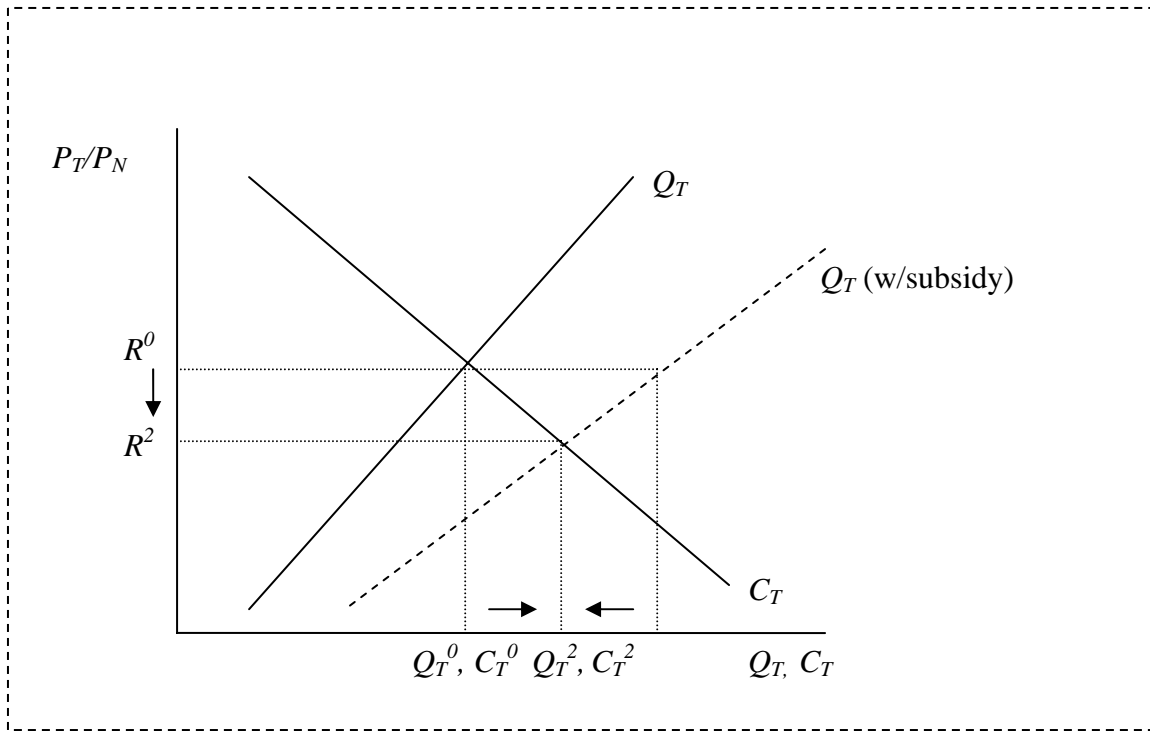


Figure 6(c)