

East Asian Growth and the Japanese Model: A Critical Assessment of Recent Analyses

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ABSTRACT

It is a well established fact that a number of East Asian countries have had much faster economic growth than most other countries for several decades. Many observers have held that this growth success is related to the interventionist policy stance that has characterised many of these countries. However, a recent World Bank study - *The East Asian Miracle* (1993) - downplays the positive role that such policies might have had (and may have elsewhere). This article contains a detailed presentation and assessment of the World Bank's analysis of East Asian growth, including the derived policy conclusions.

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The Agenda

Among the students of catch-up processes, there is a long tradition - starting with Gerschenkron (1962) - for supporting an interventionist policy stance. Countries far behind the technology frontier, it is argued, usually lack many of the resources necessary for success in advanced industry. In addition, there may be important parts of society that resists change. To overcome these handicaps, such countries have to develop "institutional instruments for which there was little or no counterpart in an established industrial country" (Gerschenkron 1962, p. 7). While Gerschenkron based his views on a study of European industrialization, several students of the more recent industrialization efforts in East Asia, most notably Japan (Johnson 1982, Freeman 1987), South-Korea (Amsden 1989) and Taiwan (Wade 1990), have come to share his basic approach. The role for government, these authors argue, is to boost the growth of the technological capabilities of firms through providing finance and other supporting factors, cooperation and guidance, (performance-related) economic incentives, etc.

Traditionally, neoclassical economists, for instance as represented by the World Bank (1991), have been rather critical towards the interventionist strand, emphasizing instead the various problems attached to interventionism such as misallocation of resources, efficiency losses, rent seeking behaviour and the like. The most important task for the government of a developing country, according to this view, is to "get the prices right" so that economic agents face the right incentives. This clearly reflects the traditional neoclassical belief in the efficiency of markets. However, the advent of the new growth theory, with its emphasis on endogenous technological progress and externalities, has somewhat challenged the theoretical basis for this position (Romer 1986, 1990, Grossman and Helpman 1991). For instance, if there are positive externalities from accumulation of physical or human capital, or R&D investments, market solutions will

normally lead to underinvestment because private investors normally do not take these externalities into account when making decisions. Then, according to the new theory, governmental intervention that affects such investments positively, through the demand for - or supply of - funds, may raise growth. This holds even in the long run, provided that change in investment behaviour is there to stay, in contrast to what the traditional theory would predict. Similarly, if there are differences across sectors in the prospects for technological progress, it may pay off for a government to intervene in order to change the economic structure of the country towards technologically more progressive sectors, for instance by protecting the most promising activities from international competition (for a while).

The advent of the new growth theories has clearly broken the stalemate and opened for a more meaningful debate on policy issues related to catch-up processes. Even the World Bank now acknowledges, at least at a theoretical level, that Japanese-type interventionism may have positive growth-inducing effects. However, the World Bank study on the "East-Asian miracle" (World Bank 1993) downplays the positive impact that such policies have had in East Asia and may have elsewhere. It is argued that industrial policy (targeting certain industries) did not work in East-Asia, and thus is of little relevance for other countries. Furthermore, the study points out, some of the attempts to increase investments, although successful in the East-Asian case, rested on national control of the markets for capital and foreign exchange. These markets have since been deregulated almost everywhere. Thus it is concluded the East-Asian experience in this field is probably not replicable. In other cases, the World Bank study argues, the policies may be too challenging institutionally. For instance, a highly competent and independent bureaucracy seems to be a must for successful interventionism, and most developing countries are according to the report far from meeting this requirement. The only aspect of the East-Asian policy package that receives really wholehearted support is the emphasis on exports, which -

incidentally - may also be consistent with the policy recipe of the traditional theory.¹

It is impossible within the context of this paper to discuss all aspects of this controversy,² and we will confine ourselves to the more narrow question of what the empirical evidence on growth presented the report actually shows. This evidence consists mainly of a set of regressions between productivity growth, however defined, and variables that are assumed to impact on this. There is also an attempt to take changes in the structure of production into account. The following sections contain a detailed presentation and assessment of the empirical work on growth (and the derived policy conclusions). Then we discuss what the study has to say about industrial policies. We also briefly visit some other applied studies on East Asian growth that have published in the wake of the World Bank Report. Finally some tentative conclusions on the state of the art and the future research agenda in this area are offered.

Does accumulation explain it all?

The first shot on this issue in the report is a cross country regression of the type that has become standard in the empirical literature for a sample of both industrialised and developing countries in the last decades. This regression, which includes explanatory variables reflecting the scope for catch-up and accumulation of physical and human capital, fits poorly and produces large, unexplained residual for the East-Asian countries. On this basis a decomposition (or "growth accounting") of the growth performance of the East Asian countries is made. It is claimed that the results support the conclusion that "between 60 and 90 percent of their output

¹ In the traditional theory "openness" to trade is regarded as important for "getting the prices right". In addition to this the recent World Bank study also emphasizes the beneficial effects that trade may have for the acquisition of foreign technology.

² Readers that want a broader overview of the debate may benefit from the papers in Fishlow et al. (1994) and the special issue of World Development (Vol. 22, No. 4 (1994). See also Amsden and Singh (1994) and Singh (1994, 1995).

growth derives from accumulation of physical and human capital" (World Bank 1993, p. 58) and that other factors therefore are of lesser importance.

But this conclusion does not seem to be warranted. To see this, consider panel A in Table 1, which presents an overview of predicted growth and its sources for four country groupings; the so called HPAEs (high performing Asian economies),³ Latin-America, Sub-Saharan Africa and the OECD. The presentation is based on a cross-country regression from the World Bank study, covering 113 countries and the period 1960-1985.⁴ What is most noteworthy is that the predicted impact of accumulation (education and investment) far exceeds predicted growth for all four country groupings (for three of them it also exceeds actual growth). The reason for this is very simple. The contribution from the scope for catch-up (GDP rel. to USA), which normally is assumed to be a positive factor for countries behind the frontier, does in this decomposition take on a negative sign for all countries groupings, i.e. it acts as a growth retardant (and more so the more developed the country is). This inflates the contribution from the remaining (positive) factors, since the sum of all contributions necessarily has to add up (to predicted growth). A consequence of this is that it is not meaningful to calculate the ratio between the contribution to growth from one or more positive factors (say, accumulation) and predicted (or actual) growth and interpret this as a measure of the explanatory power of the factors in question. Unfortunately this is precisely what the World Bank study does. For the all the HPAEs taken together, accumulation per cent of actual growth amounts to 87 % (the last line in panel A), seemingly a reasonable figure, and consistent with the conclusion in the World Bank study. But for the three other country groupings included in the table this ratio is around 200 % or more!⁵ The only reason why this ratio

³ Hong Kong, Indonesia, Japan, Korea (South), Malaysia, Taiwan, Singapore and China.

⁴ Coefficients and data are taken from tables 1.8-9 in World Bank (1993). The prediction/decomposition presented here is based on the first of the three regressions presented in table 1.8 (i.e. without group dummies).

⁵ These numbers, it may be noted, cannot be directly read out of the tables in World Bank (1993), but

is not above 100 % for the HPAEs as well is that predicted growth is so much lower than actual growth.

Panel B presents an attempt to correct for the failure to take catch-up properly into account by assuming (as commonly done in many empirical studies of this type) that diffusion of technology follows a logistic curve. This means that the contribution to growth from diffusion of technology is an increasing function of the productivity gap (for the frontier country the contribution is zero).⁶ When calculated in this way, accumulation explains slightly above, and catch-up slightly below, one half of the predicted growth in the HPAEs. Note that since predicted growth falls short of actual growth, the shares of accumulation and catch-up in actual growth are lower.

There are, however, many methodological problems associated with growth decompositions of this type. For instance, many of the variables included in the analysis are proxies that may differ from the "true" (unobservable) variables in several respects. Arguably, some of these problems may be less damaging for the analysis of growth-differences across country groupings, since all countries may

they follow (indirectly) from the estimates and numbers presented there. It just requires a little bit of extra effort.

⁶ To see how this is done, consider the following simple model, adapted from Fagerberg (1988). Assume that gdp (Y) is a function of technology (T) and other factors (O):

$$Y = f(T, O)$$

Let small letters denote growth-rates, and e_T and e_O be the elasticity of gdp with respect to technology and other factors, respectively. Then the gdp growth may be expressed as:

$$y = e_T t + e_O o$$

Now, assume that t follow a logistic curve, so that t for any particular country may be written:

$$t = h - h (T/T_f)$$

where T_f is the level of technological development in the frontier country. Then by substitution we have:

$$y = e_T h - e_T h (T/T_f) + e_O o$$

The first two terms, then, is the contribution from international diffusion of technology (catch-up). Since we know the estimates of $(e_T h)$ and (T/T_f) from tables 1.8-9 in World Bank (1993), we may use this formula to calculate the contribution from catch up.

be affected more or less in the same way. Such an analysis is presented in panel C.⁷ It turns out that only between one fourth (HPEA - OECD) and one half (HPAE - Sub-Saharan Africa) of the actual differences in growth between the East Asian countries and other country groups may be "explained" by this approach. Only in relation to the African countries does the decomposition attribute a large share of the actual difference in growth to differences in factor accumulation. Vis-a-vis the Latin American countries differences in factor accumulation "explain" relatively little (around one fifth of the actual difference). In relation to the OECD it is even worse, the unexplained part of the actual difference in growth increases markedly when differences in factor accumulation are drawn into the picture! In fact, the only factor that contributes to the superior growth performance of East-Asia vis-a-vis the OECD countries is the productivity gap (scope for catch-up).

Squeezing down the residual

While regression models of the type discussed above generally can be made consistent with different theories (and therefore often fail to distinguish between them), the second shot on this issue in the report explicitly takes the traditional neoclassical growth model, extended to take into account human capital, as its point of departure. Constant returns to scale, e.g. that a one per cent growth in each factor yields one per cent growth, are imposed, seemingly without testing. However, for the East Asian countries the residuals continue to be large (table 2, first column). In an attempt to squeeze down the residuals, the model is reestimated on a sample of industrial countries only, and the estimates ("factor shares") thus obtained are imposed on the HPAEs on the grounds that these countries are so "allocatively efficient". This reduces the

⁷ A similar analysis is presented in Table 1.9 in World Bank (1993), but in that case group-dummies (one constant term for each country group) were included. The theoretical basis for including such dummies is weak and we do not employ them. However, the qualitative results are the same as those presented here. If anything factor growth explains less of the actual differences when group-dummies are included.

East Asian residuals somewhat, since it gives higher weights to physical and human capital (table 2, second column). Finally, the estimated technological progress (residual) from the industrialized country sample is deducted, using the familiar neoclassical argument that technological progress is the same everywhere. What is left is then interpreted as increases in technological efficiency (i.e., catch up). But there is not much left: Only a few countries catch up following this definition, and the contribution to growth thus obtained is rather small.

The purpose of all this appear to be to support the view that the lion's share of East Asian growth can be explained by conventional sources, i.e. that there is no miracle to explain. But the analysis is unconvincing. First, what should be shown - that the world conforms to the traditional neoclassical assumptions - is simply taken for granted. Thus, interaction between technological progress and factor accumulation (i.e. externalities) is ruled out by assumption. It is possible that a model based on a competing perspective would have performed better or equally well on the same data. For instance, using a more flexible model (weaker assumptions), Kwon (1994) arrives at radically different results from those published by the World Bank.⁸ Second, the handling of technology lacks internal consistency.⁹ On the one hand it is assumed that all countries benefit to the same extent from technological progress, i.e., the traditional public good assumptions, on the other that large differences in technological levels of development continue to exist across countries (due to differences in "technological efficiency"). However, if technology is a global public good, and technological progress is independent of factor accumulation, technological catch up should be fast and easy! It is also disappointing to note that the results from decades of research on innovation and diffusion of technology, indicating that technology is not at all global public good,

⁸ The study by Kwon (1994) is limited to Korea.

⁹ For an overview of the theoretical and empirical work on the relation between technology and growth, see Fagerberg (1994).

are completely ignored. Indeed, much the literature in this area now depicts technological knowledge a rather local affair, organizationally and culturally embedded, and intertwined with other factors of production. Third, as shown in table 2 (third column), the results end with a big paradox. For most countries "technological efficiency", as calculated in this study, is continually decreasing, i.e., they become gradually less and less apt!¹⁰ How is this finding to be explained within this perspective?

The above criticism notwithstanding, the World Bank interpretation of events is not without some scholarly support. In two recent growth-accounting exercises Young (1993, 1995) has presented evidence suggesting that there is nothing miraculous to East Asian growth as long as factors such as labour participation, structural changes in the composition of GDP, education and investment are properly accounted for. The first of these studies is rather similar to the one just discussed, and does not require detailed investigation. Suffice to say that diffusion of technology across country borders (catch-up) is not even taken into account. The second is a conventional growth account based on traditional neoclassical assumptions such as perfect competitions, constant return to scale etc. Again, these assumptions are simply taken for granted, not tested. Thus, growth accounts of this type should more be regarded as descriptions, reflecting among else the underlying assumptions, than tests. It follows that this framework is not well suited for making judgements on causality.¹¹

Industrial policy - of no value?

The third attempt by the study to throw some light on the

¹⁰ This result, it may be noted, is the price to be paid for using other weights than those that were suggested by the regression containing developed as well as developing countries. The estimated ones are by definition those that explain the growth of the countries included in the best possible way, given the structure of the model. When other weights are imposed the quality of the predictions generally deteriorates.

¹¹ For a more detailed presentation and discussion of growth accounting, see Fagerberg (1994).

lessons from East-Asian growth is carried out at the industry or sector level. The general idea is that if interventionist politics had any impact it should be reflected in a superior performance in the promoted sectors. To assess this impact, the study points out, it is necessary to find out what would have happened in the absence of interventionist politics. This is a valid point. But unfortunately the analysis of specific policies and their impact is totally neglected in favour of more indirect (and approximate) methods.

Three different approaches to the comparison of actual versus expected developments are pursued. The first is based on the assumption that the structure of GDP changes as the country climbs up the development ladder. Differences in country-size are also taken into account. While this approach may yield some general insights, it neglects that countries have different comparative advantages and follow different strategies (Rodrik 1994). Thus, as the study points out, this approach is too rough to allow for a test of the impact of interventionism and other factors.

The second approach, based on neoclassical trade theory, seeks to establish a correlation between the changing composition of output during recent decades and wage- and productivity levels for five East-Asian countries. Neoclassical theory, it is argued, would suggest that growth would be fastest in sectors with low initial wage- or productivity levels, while successful interventionism is assumed to lead to an association between high growth and high wage- or productivity levels at the end of the period. This way of putting things is by no means obvious. For instance, one of the most influential arguments in favour of interventionism rests on the idea of "coordination failure", i.e., the failure by the market to generate a set of actions that - if coordinated - would lead to highly profitable outcome. In this case there is no reason why the firms or industries concerned should not be characterized by low relative wages at the outset (prior to intervention or coordination). However, the data do not seem to provide much support for the hypotheses outlined in the World

Bank study. For Hong Kong, Japan and Taiwan there is no correlation at all. Only for Korea and Singapore are there some significant results, but these generally go in opposite directions. Thus the results are at best inconclusive. However, the authors of the World Bank study do their best to explain away this rather obvious result. In the case of Singapore, for which the results support the "interventionist" hypothesis, it is suggested that this result is also consistent with the neoclassical view, because of the changing factor endowments of that country during the period of investigation. Similarly, the disappointing result for Japan is explained away with reference of the advanced state of its economy (which the theory apparently is not suited for). However, this means, as pointed out by Rodrik, that "the empirical analysis was inappropriate to begin with! One wonders what the point of running regressions is if any result will be taken to confirm the authors' priors" (Rodrik 1994, p. 31).

A third approach calculates so-called "total factor productivity growth rates" (what remains when the contribution from factor growth is deducted) at the industry level and compares the performance of promoted and non-promoted industries. Again the result is mixed, with some evidence in favour of the interventionist stance in the case of Japan, less so for others, although this conclusion may be disputed. For instance, Wade (1994) argues that some of the sectors that the study regards as non-promoted, such as textiles, in fact were heavily promoted in some periods and countries. Another problem is - as before - that the calculations are based on very restrictive assumptions, such as those of perfect competition and constant returns to scale, which are not tested. Kwon (1994) argues that these assumptions "are typically unsuitable for the estimation of rapidly growing economies" (p. 636). Based on less restrictive assumption, allowing among else for economies of scale, he arrives at results (for Korea) that essentially contradicts those presented by the World Bank; "Contrary to the World Bank's findings, ... productivity change has been higher in promoted sectors" (p. 638).

Openness

The World Bank study makes a big point about the importance of exports. However the empirical evidence presented in the study (Table 6.17-18) shows that this relationship is rather fragile (sensitive to differences in specification) and may be subject to different interpretations.¹² This is in accordance with other available evidence on the issue (Levine and Renelt 1992, Fagerberg 1994). The problem is not to establish a correlation between, say, high growth of GDP and high export growth, but to determine what the direction of causation is. For instance, a recent study of the time pattern of exports and investment in Korea and Taiwan concludes that the most likely direction of causation is from investment to exports, i.e., from accumulation to openness, not the other way around (Rodrik 1995).

Concluding remarks

The World Bank study on East Asia was conceived as a response to the challenge to orthodoxy from the success of the Japanese model of economic development. The project was launched with the active backing of the Japanese government. It led to an impressive amount of high quality research as well as an increased attention to the factors behind the economic success stories in East Asia.

Besides that, what are the lessons from the study and the ensuing debate? As pointed out previously the study presents its conclusions in an admirably clear way. It so happens that these in most respects are in accordance with the traditional policy stance of the World Bank. Unfortunately, detailed scrutiny - here and elsewhere - has shown that many of these conclusions are not based on solid research. Indeed, the

¹² See, for instance, the following remark: "One possible interpretation of these results is that a high concentration of manufactures exports relative to total exports, rather than openness, contributes relatively more to productivity change .." (World Bank 1993, p. 321).

presentation of research results in the report has in some cases been shown to be seriously biased. To reveal the true lessons, then, one has to go beyond the World Bank rhetoric. Further research may also be necessary.

This is how I prefer to look at it. The main merit of the World Bank study on East Asia is that it has focused the attention of many clever people on the East Asian growth process. This has raised many interesting issues. For instance, does it matter what you do or (only) how you do it? The idea that some activities are more promising than others is as old as economics itself. The World Bank study approached the issue, but did not resolve it. Furthermore, to what extent can the high growth in these countries be shown to be related to successful dealing with coordination failures? Are such failures important for the low growth (if any) in many poor countries today? Related to this, how can we explain that policies "similar" to some of those at work in East Asia do not seem to have worked elsewhere? Indeed, a sharper focus on actual policies, their implementation (including the institutional setting) and results seems to be very relevant. Another important issue with far-reaching implications is what role the high degree of regulation and control of financial markets (and the markets for foreign exchange) played in the East Asian growth process. Is it really true, as argued by the World Bank, that these policies are not at all replicable due to international system changes? This list could easily be continued, but I will stop here.

Thus, in my view, we are closer to the beginning than to the end in our search for an understanding of how countries like Japan, Korea and Taiwan got where they are to day. We may not have so many good answers yet. But at least we have some good questions.

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Table 1: Contribution of Accumulation to Growth (per cent)

(A) Calculated as in World Bank (1983)

	HPAE	LATIN AMERICA	SUB-SAHARA AFRICA	OECD
Constant	-0.7	-0.7	-0.7	-0.7
GDP per cap. rel. to USA	-0.7	-0.9	-0.4	-2.3
Primary education	2.4	2.3	1.2	2.9
Secondary education	0.7	0.5	0.1	1.3
Population growth	0.2	0.2	0.3	0.1
Investment (share in gdp)	1.4	1.0	0.8	1.5
Predicted growth	3.4	2.3	1.2	2.7
Of which accumulation	4.5	3.7	2.0	5.7
Accumulation in per cent of predicted growth	135.1	160.4	168.3	208.6
Actual growth	5.2	1.6	1.0	2.9
Accumulation in per cent of actual growth	87.2	236.9	199.4	197.0
Predicted growth in per cent of actual growth	64.5	147.7	118.4	94.4

(B) Catch-up taken more properly into account

	HPAE	LATIN AMERICA	SUB-SAHARA AFRICA	OECD
Constant	-5.0	-5.0	-5.0	-5.0
GDP per cap. rel. to USA	3.6	3.4	3.9	2.0
Primary education	2.4	2.3	1.2	2.9
Secondary education	0.7	0.5	0.1	1.3
Population growth	0.2	0.2	0.3	0.1
Investment (share in gdp)	1.4	1.0	0.8	1.5
Predicted growth	3.4	2.3	1.2	2.7
Catch-up in per cent of predicted growth + 5 %	43.2	45.8	63.1	25.4
Accumulation in per cent of predicted growth + 5 %	54.3	51.1	32.6	73.5

(C) Accounting for differences in growth

	HPAE- LATIN AMERICA	HPAE- SUB-SAHARA AFRICA	HPAE- OECD
Source of difference in growth:			
GDP per cap. rel. to USA	0.2	-0.3	1.6
Primary education	0.2	1.3	-0.5
Secondary education	0.2	0.6	-0.6
Population growth	-0.0	-0.1	0.1
Investment (share in gdp)	0.4	0.6	-0.1
Total predicted difference	1.0	2.2	0.6
Actual difference	3.6	4.2	2.3
Predicted difference in per cent of actual difference	28.2	51.5	27.4

Notes

1. Sources and definitions as in World Bank (1993).
2. Accumulation is the sum of primary education, secondary education and investment.

Table 2: Squeezing down the "residual" (TFP)

	Mark 1	Mark 2	Mark 3
Hong Kong	3.6	2.4	2.0
Indonesia	1.3	-0.8	-1.2
Japan	3.5	1.4	1.0
Korea	3.1	0.2	-0.2
Malaysia	1.1	-1.3	-1.8
Singapore	1.2	-3.0	-3.5
Taiwan	3.8	1.3	0.8
Thailand	2.5	0.5	0.1
Latin-America	0.1	-1.0	-1.4
Sub-Saharan Africa	-1.0	-3.0	-3.5

Notes

-Mark 1 is estimated as a country-specific fixed effect in a pooled cross-country time series regression covering 87 countries and thirty years and including variables for physical and human capital and labour. Constant returns to scale are assumed (Cobb-Douglas).

-Mark 2 is calculated using weights obtained from a much smaller sample containing only developed countries.

-Mark 3 is Mark 2 less the estimated TFP-growth for the developed countries.

Source: World Bank (1993) Tables A1.2-3