Report: East Asian Miracle

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The East Asian Miracle refers to a period of high economic growth between 1960 and 1990 in a few Asian countries, and a canonical study on the policy aspects of the miracle is the 1993 World Bank report [1], authored by US economist John Page. Page restricts attention to 8 High Performing Asian Economies (HPAEs), namely Japan, the four tigers (Hong Kong, Singapore, South Korea, Taiwan), and 3 NIEs (Indonesia, Malaysia, Thailand) which have generally exhibited exceptional growth rates both from the 60s-90s as well as 90s to present day. In this essay, I present both the reasonable and unreasonable aspects the World Bank report, which generally seems strongly-worded without sufficient self-criticism. Joseph Stiglitz's 1996 article provides a more balanced explanation [2], while suggested reading material [3] authored by Wan-wen Chu primarily criticizes Page's underestimation of the importance of selective government interventions.

The policy decisions leading to the growth of the HPAEs has been subject to heated debate in the previous century, resulting in two schools of thought. One side emphasizes the importance of economic "basics", specifically Macroeconomic stability, reliable Legal framework, and the accumulation of Human capital. Page calls this side "Fundamentalists". The other side emphasizes the importance of Technology catch-up with the US, and selective government Interventions. Page calls this side "Mystics". As such, Page is openly biased towards the fundamentalist viewpoint. Calling the other side "mystic" is in itself unnecessary and openly dismissive, even when his own statistical analysis goes on to find that both parties are reasonable in many ways. It might have been better to just call it non-fundamentalist!

To be dismissive of technological catch-up, Page didn't have the fortune of witnessing the revolution of computers and mobile devices post 1990. Although one can argue that US companies such as Google, Microsoft, and Apple led the revolution, several inputs to their products such as advanced semiconductor technology as well as software have been outsourced from East-Asian countries. Hence, if Page were to write an essay on the East Asian Miracle today, he probably wouldn't be as dismissive of technology catch-up as he was in 1993! The continual high-growth in the last three decades (1990-2020) has established South Korea and Taiwan as major hubs of semiconductor technology, while Singapore and Hong Kong have established themselves as important centres for international banks and other financial companies. Economics in general ignores genetic and cultural differences between countries; particularly the possibility of innate advantages in intellect and productivity. While I don't wish to elaborate on this non-economic viewpoint, it is important to note that focus of economics is generally limited to investments and related public policy decisions.

The initial statistical analysis in the World Bank report also seems to have an inherent bias to project US wealth. Although East Asian economies were poor relative to US in 1960, Relative GDP per capita is an irrelevant factor to regress GDP growth rate (fig 1) and average investment rate (fig 3) with. No wonder the error in these regressions were observed to be large.

The traditional crux of the policy debate has been whether the HPAE growth was predominantly driven by factor accumulation or productivity growth. To understand this, Page pursues a mathematical approach: A differential of an international cross-economy production function provides a metric for Total Factor Productivity (TFP) growth rate. The per-capita TFP growth rate (a) depends on three per-capita variables: output (q), physical capital (k), and human capital (e); as well as the income shares [under assumption of competitive factor markets and constant returns to scale] s_k, s_e of physical and human capital respectively.

$$a = (q-1) - s_k(k-1) - s_e(e-1) \tag{1}$$

This equation provides a metric for the elasticity of output relative to physical and human capital, with a larger output elasticity signifying more productivity-driven TFP growth. Page considers a full-sample of 87 countries with this metric. My critique of Table 1: Comparing the full-sample with high-income countries provides no insight specifically into East Asian countries. The data presentation is again a needless attempt to show that a few wealthy countries are still more elastic to capital and human endowments (implying productivity-driven growth) relative to the full-sample. The key point Page is potentially hiding is if the output elasticity of high-income countries are compared only with the HPAEs, we can definitely expect productivity-driven TFP growth, at least in the East Asian tigers, to be more dominant than the high-income countries.

As a result of the subtle trick described above, Page draws a number of flawed inferences. "There is very little productivity catch-up in low and middle-income countries","The range of TFP growth in high-income countries is quite compact, especially in comparison with low and middle income countries". Both of these are fruitless inferences with respect to the HPAEs since it was obtained by comparing the output elasticities of high-income countries with the full-sample rather than only the HPAEs. Additionally, one deficiency Page himself admitted was the unavailability of income-share data (s_k, s_e) for all countries. Despite this, he made a strong comment "Korea and Thailand are unremarkable on the basis of high-income country production function parameters". It may not be meaningful to use another country's income-share parameters to observe this point.

Next, to observe patterns of technology catch-up, Page describes a "Technical efficiency change" metric, which is again calculated using the output elasticities of high-income countries. As a result, in Table 2, Page portrays a negative technical efficiency change in many HPAEs from 1960 to 1989. In fact, the numbers put Singapore (-3.451) in the same league as Africa!(-3.454) The data clearly doesn't hold explanatory power.

Despite such potentially poor approximations, Page admits that growth in Hong-Kong, Taiwan, and Japan are productivity-driven, while that in Indonesia, Singapore, and Malaysia are factor accumulation driven. Overall, Page is still biased to the fundamentalist viewpoint. He remarks "HPAEs are unusually successful at allocating FOP" My critique: It is worth noting that productivity and factor accumulation may not be uncorrelated variables in understanding growth. From an explanatory perspective, they can be positively correlated. For instance, higher productivity can be naturally associated with better factor accumulation.

In the next section, Page provides a more reasonable coverage of the macroeconomic fundamentals that the HPAEs managed very well. First, they handled public sector Budget Deficits with a stable low inflation rate, which implied a stable real interest rate. Explaining the case of Malaysia and Thailand, Page notes that they successfully financed their deficits due to high growth, high savings (which made domestic financing through mobilized Government Provident Fund preferable relative to printing money), and low initial debt to GDP ratios. Second, they handled External Debts with high levels of exports. It may be noted that out of the 8 HPAEs, only Indonesia, South Korea, Malaysia, and Thailand borrowed money from abroad. Finally, the HPAEs maintained stable Exchange Rates due to moderate inflation

and active forex management.

Despite his initial bias to the fundamentalist viewpoint, Page admitted that it doesn't give the full picture. In most cases, the HPAE governments intervened systematically in many forms, such as - targeted and subsidized credit, domestic import substitutes, support of government banks, and export targets among other ways. Outward orientation, in particular, played a crucial role in the East Asian success. However, to quantify Outward Orientation, Page explains that the Manufactured Export Orientation (= Manufactured Exports/Total Exports) is a more relevant metric than Manufactured Export Size relative to GDP. Both are positively correlated with TFP growth, however, Manufactured Export Orientation is also positively correlated with Education Stock, which in turn is positively correlated with TFP growth. The inclusion of broadly-based education policies gives Manufactured Export Orientation greater explanatory power.

In the next section, Page discusses the insignificance of domestic industrial policies relative to export-push policies. It must be noted this is one of the most debated aspects of the East Asian miracle, with both Stiglitz and Wan-wen Chu criticizing the World Bank report for diminishing the importance of industrial policy. However, delving into the mathematical specifics, Page's coverage does seem reasonable, even if the relative unimportance of industrial policy lacks explanatory power. Essentially, Page addresses the following question: Were incentives to open international trade neutral or not neutral among different sectors? He then develops a mathematical model of aggregate TFP growth in terms of each sector's TFP's growth and share of value added. A differential of this metric is used on available data to draw inferences such as

- Only Japan and Korea successfully employed activist industrial policies for productivity catch-up
- Metals-Electronics-Machinery (MEM) and Textiles are generally over-represented in the industrial policies of HPAEs. However, only MEM was associated with government promotion.
- Even if excess growth of MEM is attributed to selective intervention, its influence on aggregate TFP growth is no less significant than non-promoted industries

As usual, the problem with a direct mathematical function for aggregate TFP is inconsistency with reality and explanatory power, which led to criticism from Stiglitz and Wan-wen Chu. In particular, I found Wan-wen Chu's mention of Stiglitz's Information Paradigm interesting. In the absence of perfect information, particularly imperfections in the risk and capital market, the Fundamental Welfare theorem (which states that markets naturally settle to efficient allocation, Adam Smith's invisible hand) does not hold true. Indeed, the fact that the East Asian success not been without extensive government interventions indicates the strong possibility of imperfect competition. Additionally, the fundamentalist arguments are generally static in nature, relying only on market equilibrium to reconcile with dynamics. A very realistic possibility of a disturbance of market equilibrium would also make the Fundamental Welfare theorem invalid.

The World Bank report concluded with an elaborate praise of export-push strategies, such as export targets in Japan and Korea, generally diminishing the value of domestic industrial policy. Page also suggested indirect interventions such as reduction in import-protection and duty-free regime for inputs going into export products being good incentives for adoption in other developing economies. However, the debate over the relative importance and adoption of domestic industrial policy continues to this day.

References

[1] John Page. "The East Asian miracle: four lessons for development policy". In: *NBER macroeconomics annual* 9 (1994), pp. 219–269.

[2] Joseph E Stiglitz. "Some lessons from the East Asian miracle". In: *The world Bank research observer* 11.2 (1996), pp. 151–177.

[3] Wan-wen Chu et al. "The "East Asian Miracle" and the Theoretical Analysis of Industrial Policy: A Review". In: *Academia Sinica* (1997), pp. 1–24.