

Comment on “Different Impacts of Scientific and Technological Knowledge on Economic Growth: Contrasting Science and Technology Policy in East Asia and Latin America”

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Kim and Lee (2015) presume that the difference of government science and technology policies between East Asian and Latin American countries is attributed to the contrasted patterns of economic performance between the two regions, that is the Asian miracle versus the middle income trap in Latin American countries. It is shown that a relatively greater performance in scientific output, measured by Science Citation Index journal intensity, is found in Latin American countries, but that this does not lead to higher technological output as measured by patents and industrial research and development compared with East Asian countries. Kim and Lee (2015) provide detailed information on the science, technology, and innovation policies of the two regions (focusing on Korea and Mexico), and explain the difference in the scientific and technological performance of the two regions. That is, public support for scientific activities is strong, but policies promoting the innovation capability of indigenous firms are relatively weak in Latin American countries, while public research institutions, such as the Korean Advanced Institute of Science and Technology (KAIST) in Korea, play a significant role in enhancing the technological capacity of the private sector in East Asian countries. Finally, Kim and Lee (2015) empirically investigate the role of scientific and technological knowledge in economic growth by using a panel dataset of 58 countries.

Uncovering the source of economic growth empirically is a subject attracting a large number of scholars. As well as regular factor inputs, such as physical and human capital (including the quality of these factors), various factors related to political, legal, and economic institutions, such as the degree of legal enforcement, political stability, and financial market development, are shown to be explanatory variables of the economic growth of nations. However, the economic growth rate of East Asian countries is found to be significantly higher than the other countries, even after controlling for these factors (Barro & Sala-i-Martin, 2003). Kim and Lee (2015) is highly valuable in the sense of shedding new light on the issue of the East Asian model of economic growth from the perspective of national innovation systems. Their main argument is that universities and public

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research institutes play an important role in the technological catching up of domestic firms to their competitors in developed countries. In Japan, the Agency for Industrial Science and Technology, affiliated with the Ministry of Economy, Trade and Industry (METI), is one of the government agencies playing a key role in the industrial technology development in electronics, machinery, and chemical industries. In addition, the public research institute can be a body to spin out its industrial innovation in Taiwan and China as well. Adding them to the example of Korea, such as KAIST in Kim and Lee (2015), I would agree with the authors' argument.

In fact, this paper is a great contribution by creating a new horizon of academic research on the Asian economic model. However, it opens up a substantial number of questions at the same time. First, the role of government policy in technological catching up in East Asian countries is still under discussion. For example, in Japan, there are mixed views towards the role of METI's industrial policy in economic development (pros by Johnson, 1983; cons by Friedman, 1988). The anti-industrial policy school stresses the ability of Japanese firms to cope with stiff market competition by assimilating foreign technologies effectively. Without firms' capacity for absorbing technology, their rapid catching up to their Western competitors could not have happened. Second, technological innovation does matter for manufacturing competitiveness, while the share of manufacturing outputs goes down to less than 30% in Japan and Korea. It is true that manufacturing competitiveness explains export-led economic growth in East Asian countries, but in Kim and Lee (2015) there is still a missing link on how technological development in the manufacturing sector contributes to overall economic growth.

Finally, a more relevant question to be posed for us is how the "Asian model" copes with the globalization era in the 21st century. Since Japan and Korea have developed to become Organisation for Economic Cooperation and Development countries, the question is not how they catch up to the front-runners, but how they shift out their frontier curve as front-runners. Of course, this question is outside the scope of Kim and Lee (2015), but it would be nice if any implications for the future of East Asian economy could be drawn out of their paper. I would argue that it will be difficult to deal with the "science-based economy" in the 21st century using the current "Asian model" based on manufacturing.

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