THE WORLD BANK

Improving Vietnam's Productivity

Scientific and Technological Innovation as a driver of productivity

Science, Technology and Innovation in Vietnam: Driving Sustained Growth

Key messages

1. Vietnam has come to a crossroads where one road leads to continued high growth rates to match the impressive annual growth rate of 7% over the past two decades. Along this road to the future is the modern, industrial economy that is targeted by the National Socio-Economic Development Plan. Another road includes prolonged slow growth because of structural constraints to growth – along this road are delays in providing future generations with the material benefits of growth.
2. One key differential that will determine which of the two growth paths are in Vietnam's future is the growth in productivity, and the single most important driver of productivity is innovation, more specifically, technology driven innovation.

Key actions

1. Further improve human capital
2. Promote industrial development and entrepreneurship
3. Reform Government Research Institutions
4. Build up networking and open innovation
5. Create framework conditions

Why Innovation?

Vietnam stands at a cusp of opportunity – continued high growth rates in the coming two decades to match the impressive annual growth rate of 7% over the past two decades can lead to the elimination of extreme poverty in Vietnam. Vietnam's population of over 100 million people by the next two decades could share the prosperity that comes with being a modern, industrial economy. However, the slowdown in growth over the past five or six years, though not unique to Vietnam, could also be prolonged because of structural constraints to growth, and the attainment of the twin goals of shared prosperity and elimination of extreme poverty might be delayed, depriving future generations of the material benefits of growth. One key differential that will determine the trajectory of Vietnam's growth path is the growth in productivity, and the single most important driver of productivity is innovation.

Innovation as a way of life can permeate all activities, but in the modern, networked age, the innovation that drives productivity comes from scientific research and technological development. Progress in Science and in Research & Development requires a combination of public support and private initiative, especially a focus on entrepreneurship. Rich and poor countries alike are investing heavily in scientific development with a view to benefit from innovation. In fields like bio-technology, information and communication technology (ICT) and nanotechnology, the competition between countries in intense, but so also is the scope for international cooperation.

Achievements so far

- Good human capital base for STI development. Vietnam's PISA mean score of 511 puts it above the OECD mean of 500. Vietnam is ranked 8th in Science score amongst the 65 nations that participated in PISA 2012.

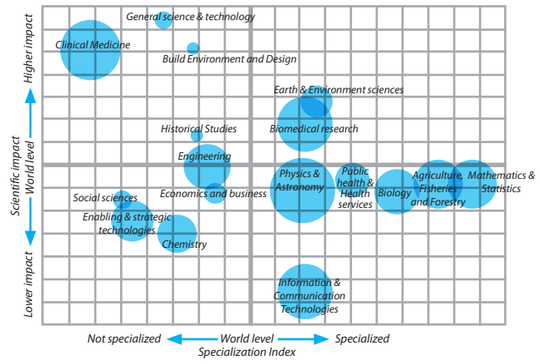
- Entrepreneurship and industrial development. By 2012 about 540,000 private firms had been registered (GSO, 2012).

- Science, technology and innovation policy. A series of measures have been undertaken in the last three decades to improve the framing conditions of the innovation system.

- Innovation Efficacy Index (IEI). Internet penetration has risen substantially since 2003 to 39.5 per 100 inhabitants in 2011, which is much higher than in Thailand (26.5) and Indonesia (15.4) – both having significantly higher GDP per capita than Vietnam.

- Revealed Comparative Advantage. The International Telecommunications Union ranked Vietnam 81st out of 155 in the ICT Development Index, ahead of Thailand (92) and Indonesia (95). In science, mobilize and exploit new knowledge for social and commercial purposes.

Vietnam's scientific impact and specialisation index, 2000-10



Note: Area of circles represents the number of scientific publications
Source: Vietnam: Joint OECD-World Bank Review of Science, Technology and Innovation.

Vietnam's advantages lie primarily with Earth and environmental sciences and biomedical research. Clinical medicine, general science and technology as well as built environment and design are also areas of good potential in Vietnam (see graph above showing the areas of scientific publications in Vietnam in a comparative international context).

… and challenges

- Productivity of human capital. Quality of education, low and unequal participation (e.g., between the urban and rural divide), and mismatches between education and the labor market. The number of Vietnamese students studying abroad reached 100,000 people by 2012 - making use of this talent requires concerted policy effort.

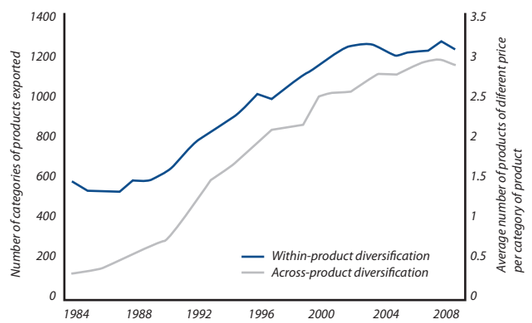
- Entrepreneurship and industrial development. In the World Bank's Doing Business, Vietnam has fallen from 87th place in 2007 to 90th in 2011 to 99th in 2012-2013. Access to finance, inadequate infrastructure, and lack of skilled labor are the most prominent problems mentioned by Vietnam's firms in the WEF Global Competitiveness Index.

- Science, technology and innovation financing. Gross R&D expenditures of Vietnam remain low. About 0.2% of GDP was spent on research and development in 2002. The ratio could have marginally increased up to 0.46% in 2010.

- STI network. Technological penetration remains quite low in Vietnam. Based on the INSEAD Innovation Efficacy Index, the country lacks the capability to

- Diversity of the Product-Mix. The lack of product diversity prevents Vietnam from improving its export basket and integrating into the global value chains more effectively in the long run.

Vietnam's Product Diversity Trend



Source: 2011 Economic and Social Survey of Asia and the Pacific, UNESCAP; Figure 4.4, P. 170.

Five major areas of focus for science, technology and innovation reform in Vietnam

1. Human Capital

- *Place more emphasis on entrepreneurship and soft skills in education* such as problem solving, creativity, leadership, communication and teamwork.
- *Provide more opportunities for upgrading skills of those already in the workforce* and improve the effectiveness of short-term training.
- *Turn a brain drain into a brain gain.* To address some of the skills constraints, the government could make a significant effort to scout potential returnees and give them powerful incentives to return.
- *Facilitate knowledge exchanges* between universities, government research institutions, and industry by providing universities with greater autonomy in establishing relations with partners as well as promoting associations and forums for knowledge exchange and collaboration.

2. Industrial Development and Entrepreneurship

- *Consider flexible funding schemes* that are geared to the stage of starting up a company, with mechanisms to learn from failure, recognizing that entrepreneurship is high risk by definition.
- *Establish effective dialogue between the government and SMEs* to provide advisory and mentorship activities through formal (SME Development Council system) and informal channels (forums).
- *Improve high-technology parks.* The parks need to be well embedded in local economies and closely linked to the local and regional universities, research institutes, and other businesses.

3. Government Research Institutions

- *Complete institutional reform of GRIs.* Complete the process of making GRI's responsive to the needs of the society by implementing Decree 115 in full.
- *Enhance economic relevance.* Define a clear division of labor between universities and GRIs to facilitate long-term specialization.

4. Networking and Open Innovation

- *Develop the infrastructure for open innovation.* Establish a platform where government agencies and users can identify major challenges facing Vietnam at the moment, and open funding calls where various innovators and entrepreneurs can apply and contribute.
- *Promote knowledge spillovers between foreign firms and local businesses* by ensuring more openness (including relaxing protectionist measures) and increasing absorptive capacity of domestic companies.
- *Promote international knowledge and production networks.* Examples of successful catch-up demonstrate the importance of accessing foreign sources of knowledge through purchase of equipment, foreign direct investment (FDI), original equipment manufacturing (OEM), student mobility, and international R&D collaboration.

5. Framework Conditions

- *Structural reforms* (such as reducing the dominance of SOEs and restructuring the banking sector)– which can also spur innovation – are required to achieve long-term growth.
- *Proceed with the general institutional development aimed at improving the effectiveness of the government.* Improve transparency, auditing and reporting standards, and the complexity of the legal system.
- *Improve the state of policy intelligence, STI statistics, and associated evaluation mechanisms.* A sound basis for policy design requires systematic evidence on the performance of the innovation system and its constituent parts through statistics, qualitative analysis and feedback.

A detailed treatment of Science, Technology and Innovation issues can be obtained from the forthcoming "Vietnam: Joint OECD-World Bank Review of Science, Technology and Innovation", which partly constitutes the source material for this policy note, prepared by the Human Development Department of the World Bank.

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Note: Students at the University of Agriculture and Forestry show the "solar car" that they invented.