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Trade, Technology and Development in LDCs, SSA and SVEs: An Assessment

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Background

Innovation and technological change have significantly altered the economic landscape over the past decades, contributing importantly to growth in developed economies and promoting a catching-up process in developing countries. The spread of information and communication technology (ICT) has changed many aspects of the economy and society through increased efficiency and enhanced access but it has not been the only change of significance; technological developments have also contributed to product sophistication, both for low-end and high-end users, and promoted the diversification of the industrial structure of economies.

This issue of *Commonwealth Trade Hot Topics* provides a brief review of the relationship between trade and technology from the perspective of least developed countries (LDCs), Sub-Saharan Africa (SSA) and small vulnerable economies (SVEs), discussing realistic prospects for their integration in the global economy, identifying lessons from relatively advanced developing countries and proposing some domestic and international policy instruments that are necessary to support these countries.

The two-way relationship between technology and trade

Through shaping comparative advantage, technology affects a country's trade performance. Technological innovation has also had a significant impact on trade costs through the introduction of ICT. The greater the technological level a firm has, the higher its productivity will be and hence the firm is more likely to become more competitive.

On the other hand, international trade provides a channel of communication that facilitates cross-border learning and technological upgrading in LDCs. Importing is one of the major channels through which cross-border learning can be achieved in these countries. Technology that is embedded in imported goods, machinery and equipment will help the LDCs to access more advanced technology and may therefore improve firms' productive capacity or enable firms to expand product varieties that they could not produce previously. Exporting is another equally crucial channel for technological transmission. Firms are able to upgrade technological capability and obtain valuable experiences via exporting, the so-called 'learning by exporting' phenomenon. When engaging in exporting activities, interaction with foreign customers and clients in the destination market provides firms in LDCs with easier access to advanced know-how. Potential knowledge transfers and spillovers may emerge through participating in both imports and exports.

Therefore the two-way relationship between technology and trade may eventually lead to a self-reinforcing circle – higher levels of technology result in more competition and more trade. Inversely, with a lower technology level, firms will be less competitive

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and less likely to trade which may lead to a downwards growth spiral that is not easily broken.

The state of the technology-trade nexus in the LDCs, SSA and SVEs

As Figures 1 and 2 show, since the start of the new millennium, there has been evidence of an increasing trend in the share of trade of the LDCs and SSA. However, despite this upward trend, the share of the least developed countries in total world trade still remains marginal, accounting for only around 1 per cent of the total. The share of SSA is less than 2.5 per cent. Even though it has risen in the past decade, the extent of trade between LDCs, SSA and the rest of the world is very limited. This seems to suggest that the linkage between technology and trade across LDCs is weak in both directions, that is, both in terms of the role of technology in trade competitiveness and the role of knowledge transfer through trade.

But this is not to argue that there has been no innovation taking place in LDCs, SSA and SVEs. Research in developing countries has found active incremental and managerial innovations on the ground but the scale and scope of innovation are far less than is desired. Such limited innovation activities are insufficient to support firms in LDCs to compete in the global market, let alone integrate into global value chains.

There are always two sides of a coin when trying to integrate into the global value chain and enter into the international market. On the one side, the LDCs are likely to be excluded from trade in technology-intensive goods even though such trade has been growing tremendously in the past decades. Trade in technology-intensive goods normally demands a certain level of technological capability and sustained efforts in accumulating knowledge. Hence, the LDCs are likely to be excluded if there is no action taken to enhance their technological capabilities and labour skills.

On the flip side of the coin, we see growth in the demand for technology-intensive goods. Some countries, especially those in the middle of the income scale, will move up their position in the value chain. This movement creates spaces for labour-intensive industries in LDCs which focus on low-technology or medium-low-technology products. Accordingly, there is an emerging opportunity for LDCs during the reshaping of the global value chain, particularly when there is a change of the comparative advantage of countries which already widely engage in international trade.

One thing that should be noted is that the opportunity window can be temporary and short because there are other developing countries competing for these spaces. Therefore, for LDCs to be integrated into the international production chain, especially in these technology-intensive industries, there is an urgent need to devote more efforts to support innovation as well as in upgrading labour skills. This is a long-term goal for LDCs and it may take some time to accomplish. Lessons can be drawn from relatively advanced developing countries such as China.

The lessons LDCs, SSA and SVEs can learn from other advanced developing countries such as China

First, China's economic development started from a basis in its comparative advantages. Its initial springboard for integrating into the world market was therefore from labour-intensive industries. Subsequently, China tried to reinvest the income generated from exports of labour-intensive products into the skill-intensive and technology-intensive industries. The focus has now shifted to develop these skills and technology-intensive industries.

Second, China has also adopted different development strategies at different levels of development. At the earlier stage of development, technological learning and imitation through

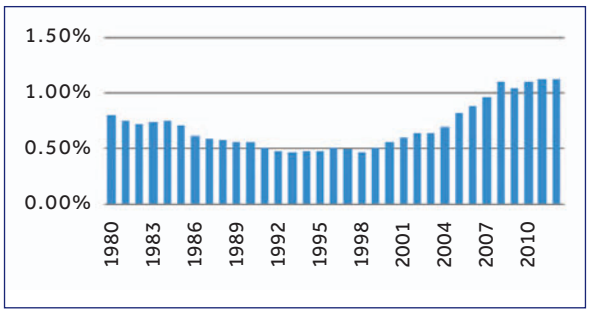

Figure 1: Share of world trade: Least developed countries: 1980 - 2012

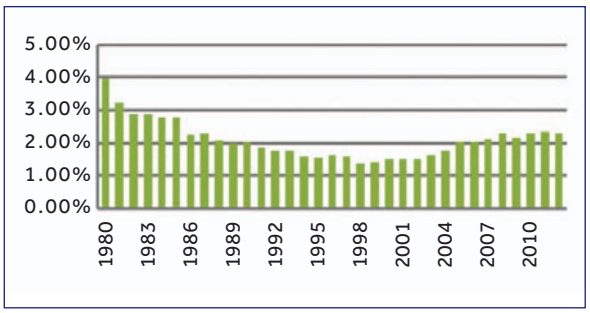

Figure 2: Share of world trade: Sub-Saharan Africa: 1980 - 2012

international linkages were used as an important strategy to acquire technological advances required to upgrade the technological capability of the industry and firms. However, in more recent years as China has developed into a middle-income country and aimed to catch-up with those high-income countries, the strategic emphasis has shifted towards research and development (R&D) promotion and knowledge creation. Establishing competitive indigenous innovation capability has been highlighted as one of the top priorities in the development and investment strategies of the nation.

Third, attempting to promote exports and integrate into the global value chain, the Chinese Government has introduced an export promotion strategy, together with a series of supporting policies, to increase its share of exports in the global market: measures include export credits, export tax, duty rebates, training in export and international marketing skills, the provision of international marketing information, the establishment of special economic zones and export promotion zones, and the depreciation of the Chinese currency. All of these strategic practices have effectively utilised one of China's key strategic production factors, consistent with the comparative advantage theory, that is, the cheap labour which is abundantly available in China. Therefore, export-oriented policies have been undertaken successfully to help Chinese industries to engage in processing activities and subsequently integrate into the global production chain.

Last but not least, when we refer to the Chinese experiences that can provide lessons learned for other countries, the role of the state should not be ignored. There are positive impacts of having a strong state and centralised government but, of course, adverse implications also exist. Rather than using the invisible hand of the market to relocate resources, promote competition and productivity, a developmental state like China intervenes more directly in its economic activities through a variety of means to promote the growth of new industries and to reduce the dislocations caused by shifts in investment and profits from old to new industries. The role of the state in promoting growth in this context remains ambiguous. Other developing countries should comprehensively diagnose what the benefits are from having strong state intervention as well as what the negative effects of such intervention may be. It is also advisable to understand the conditions necessary for effective state intervention as well.

Policy support to the LDCs, SSA and SVEs

There is also need for domestic and international policy instruments to support LDCs, SSA and SVEs, if they are to benefit from trade, technology and development. From the domestic perspective, first, innovation has been identified as a key factor contributing to the process of upgrading technological capability. Within contemporary government and society, there is a misunderstanding whereby innovation is perceived to be something too distant or not relevant to low-income countries. It is simply believed to be the business of others. Thus, actions need to be undertaken to change mindsets and innovation should be acknowledged to be an essential element in dynamic, sustainable and long-term productivity and economic growth. This is not only true for developed economies but also for the developing ones.

At the same time, different types of innovation should be distinguished. 'Novel' innovation describes cutting-edge inventions and knowledge creation, while 'diffusionary' and 'imitative' innovation is understood to mean both learning new techniques as well as imitating know-how which already exists. Across low-income countries and the LDCs, diffusionary and imitative innovation relying upon international diffusion has been identified as a critical channel for technological acquisition and, therefore, corresponding policy tools should be created in order to promote technological upgrading. It is worthwhile to emphasise that innovation does not only involve technological innovation, which means R&D and lab-based innovations, but also includes innovation with respect to other areas such as the managerial practices and business models that firms have introduced (new organisational structures, new ways of organising their production, new ways of marketing and business models). All of these different types of innovation would effectively enhance the productivity of firms and improve their international competitiveness.

Second, we need to have a thorough understanding with respect to the positive and negative sides of industrial policy (as was mentioned in the discussion of lessons from China). The government should intervene when market failure appears. While the market is functional and able to reallocate resources effectively, having extra government intervention will perhaps bring in distortion instead of correction. In addition, government capability is likely to be limited by the existence of potential information asymmetry and diverse incentives from different agents of the state. Governments are likely to face information asymmetry

and are unlikely to fully understand the reality of what is happening in the market. Therefore, decision-making and policy instruments may not be well-designed to remove barriers or effectively correct the existing market failure. At the same time, the disparate incentives of agents of the state potentially impede the effective functioning of the government: for example, the self-interested and short-term behaviours of government officials can create their own problems. Similarly, different government departments also have different objectives which may not coincide with those of the state sector overall and conflicts of interest between different government departments can likewise cause failure.

Furthermore, it is worthwhile to point out that in the twenty-first century, the role of, and policy space for, industrial policies were more limited compared to the position in the past. There have been many trade disputes and corresponding trade sanctions have been imposed. Our recommendation is therefore to undertake less of a 'push' or supply-side approach and adopt more of a 'pull' or demand-side perspective: at the same time we should also instigate more policies that aim to create a better operating environment and regulatory regime for firms in LDCs to engage in innovation and enhance their competitiveness and upgrade their technological capability. Domestic supporting policies should be designed to create an environment which is friendly towards development rather than merely being confined to subsidies. Along with the intensified globalisation and acceleration of world economic integration, selective industrial policies are very likely to induce trade retaliation and trade disputes. Accordingly, governments in the LDCs, SSA and SVEs are advised to place more emphasis on horizontal policies such as education, infrastructure and healthcare policies which may improve the overall quality and environment of the society and economy.

From the international perspective, first, more international demand for trade and products from the LDCs, SSA and SVEs is needed. In order to achieve this, initiatives should be undertaken to strengthen the promotion of free trade and multilateral trade arrangements through the World Trade Organization. Since the Doha Round, the promotion of free trade and multilateral trade agreements have been intensively debated and no significant progress has been made on these fronts. Second, international communities and institutions should continue giving preferential trade arrangements to the LDCs, SSA and SVEs such as tax exemptions and in particular demand for the products of LDCs. Third, better international market information should be provided for exporters and firms in LDCs. Some scholars point out that information asymmetry has been one of the main barriers that constrain the export performance of firms from LDCs. Better provision of marketing and price information is another equally crucial policy initiative from an international perspective.

Undoubtedly, we should extend our efforts in strengthening supply-side capacity through international knowledge diffusion, which refers to South–South technology transfer through flows of strategic collaboration, trade and foreign direct investment between the LDCs, SSA and SVEs and other relatively advanced developing countries, such as the BRIC countries. Traditional knowledge transfer should be continued to sustain the development of the indigenous technological capability of LDCs and foster the integration of the foreign-invested sector into the local economy. International collaboration and aid should be called on to help LDCs to improve their infrastructure such as road and ICT infrastructure and provide training in trade skills which would consequently reduce the trade cost. Public investment in roads, ports and other transportation infrastructure reduces trade costs and could, for example, enhance the participation of LDCs in world trade. Similarly, investment in ICT could enable LDCs to engage more fully in world markets for services. With better infrastructure and ICT facilities, low transportation costs within the country and the compatible skills of firms experienced in international marketing, the trade performance of the LDCs, SSA and SVEs will also be enhanced.

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