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IDE Research Bulletin

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Supply-chain industrialization and growth: Does value-added matter?

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The aim of this study is to clarify production networks using various data and methodology and then study the nexus between the production network and economic growth. Our conjecture is that not all development strategies based on integrating into global supply chains lead to the same growth benefits. We expect to find that the value added of exports, and not only job creation, is critical to sustainable growth. Our further aim would be to show how policies may need to maximize local value added and spillovers from FDI as well as tackle the fickleness of multinational relocations. As globalization continues, nowadays almost no country pursues industrialization on its own, but rather engages into global production networks. Some countries, such as Singapore or Vietnam, are cases in point. Although the development of production networks has recently been analyzed in the economics literature, the nexus between such networks and economic growth has not been well clarified. It is utmost concern especially for developing countries to know such nexus. On the other hand, the economics literature has very recently shed the first light on value-added in trade. Several studies reveal that exports in value-added terms are often different from gross exports. Thus, the aim of this project is to clarify the supply-chain-growth nexus, taking into account the value-added in production networks.

The study produced five papers:

1. Factory Asia: Unveiling supply-chain in Asia with Intra-industry trade index (Tadashi Ito)
2. Production fragmentation, Upstreamness, and Value-added: Evidence from Factory Asia 1985-2005 (Pierre-Louis Vézina、Tadashi Ito)
3. The smile curve: Evolving sources of value added in manufacturing (Richard Baldwin, Tadashi Ito and Hitoshi Sato)
4. Unveiling the evolving sources of value added in exports (Richard Baldwin, Rikard Forslid and Tadashi Ito)
5. Economic Globalization and Fluctuations: How Does Trade Induce Output Comovements? (Hitoshi Sato)

1 attempts to unveil the production fragmentation in Asia through Intra-industry trade index. 2 computes value-added exports using the Asian International Input-Output Table and attempts to unveil the production fragmentation in Asia and argues its impact on growth. 3 and 4 studies the shift of value-added in Asian exporters using the value-added computed from the Asian International Input-Output Table, explores the

underlying causes of such phenomena, and discusses its development policy implication. 4 studies the effect of supply-chain on business cycle synchronization.

Factory Asia: Unveiling supply-chain in Asia with Intra-industry trade index (Tadashi Ito)

This paper attempts to unveil the supply-chain among Asian countries, using the Intra-industry index, which has the virtue of capturing a long term trend compared with other data sets such as Input-output table. It is found that the supply-chain in Asia was rapidly deepened by the beginning of the 2000s, and this is particularly evident in Machinery sector.

Production fragmentation, Upstreamness, and Value-added: Evidence from Factory Asia 1985-2005 (Pierre-Louis Vézina and Tadashi Ito)

We exploit the recent release of the 2005 Asian Input-Output Matrix to dress a picture of the geographic fragmentation of value added in Factory Asia from 1985 to 2005. We document 5 stylized facts. The first is that the average share of foreign value added embedded in production rose by about 12 percentage points between 1985 and 2005, from 10.7% to 23.2%. The second is that, contrary to popular belief, China's production embeds a smaller share of foreign value added than other Factory Asia countries'. Thirdly, transport equipment is the most fragmented sector; foreign value added accounted for about 35% of its total value added in 2005. Fourthly, between 1985 and 2005 among factory Asia countries China grew most after Japan as a source of value added to other countries' production. Fifthly, country-industries at the upstream and downstream extremities of the supply chain embed less foreign value added than those with intermediate levels of upstreamness.

The smile curve: Evolving sources of value added in manufacturing (Richard Baldwin, Tadashi Ito and Hitoshi Sato)

The geographical fragmentation of production processes is accompanied by the displacement of value added from high-technology-high-wage nations to low-technology-low-wage nations. However, developing nations are worried that they are getting the wrong sorts of jobs. This concern is often organised around an intellectual concept – the so-called 'smile curve', which asserts that the share of value added in manufactured products is shifting from the fabrication stages to pre- and post-fabrication services. The general assertion held among developing nation policy makers is that this distribution is moving against fabrication stages, and thus they are getting the 'bad' jobs, i.e. jobs associated with low value added per worker, while the 'good' jobs stay in the North. The goal of this paper is to shed light on how important the smile-curve notion is at economy level, in order to obtain some answers to the above-mentioned economy-wide policy issues/concerns. Using JETRO-IDE's Asian Input-Output table, we find that for almost all sectors/nations the inputs from manufacturing sectors provided rising shares of nations' export value added from 1985 to 1995, but sharply falling shares from 1995 to 2005, accompanied by a concomitant drastic increase of the share of inputs coming from service sectors.

Unveiling the evolving sources of value added in exports (Richard Baldwin, Rikard Forslid and Tadashi Ito)

This servicification of manufacturing is transformative for policy – or at least should be. Governments around the world – but especially in Asia – are heavily invested in promoting development via industrialisation. The linchpin of such policy is the encouragement, promotion and support for exports of manufactured goods. Servicification matters for such policies since it blurs the distinction between manufacturing and service sectors. For example the competitiveness of a nation's manufactured exports is far more dependent on the local availability of service that have low, quality-adjusted prices. Trying to promote manufactured exports without liberalising the import of services may be self-defeating and this increasingly so as services share in export value added rises.

Second, it means that job creation is subject to more intersectoral linkage than traditionally thought. For example, a trade agreement that expands export opportunities for a nation's manufacturers will produce job creation well beyond the manufactured sector. Thus looking for evidence of pro-job effects of trade agreements requires looking at the service sector as well as the manufacturing sectors.

Third, it should help refocus industrial policies on a broader range of 'good jobs'. As manufacturing task are increasingly commoditised by competition from low wage nations on one hand and robots on the other, good manufacturing jobs are increasing those that involve manufacturing-linked service tasks. The extreme of this trend can be seen in the British company Dyson which produces high-end vacuum cleaners. However even though the vacuum cleaners carry the Dyson brand, Dyson owns no factories at all. None of its workers are involved in fabrication. They are engaged in the full range of services necessary to produce the goods, but they don't actually make the goods.

Moreover it changes – or should change – the way we think about trade policy, development and job creation. On trade policy, it strengthens the need to address trade in service barriers at the same time as trade in goods barriers. There will be a positive feedback effect between trade policies that facilitate the export of goods and the imports of services. For many nations, this means that opening up their markets to direct and embodied foreign services is key to making their manufactured goods competitive. When it comes to development policy, it argues that the classic focus on factories can be misleading. New goods exports will create jobs in the service sectors supplying value added to the goods export sectors – as well as creating jobs directly. Finally on job creation, the pervasive servicification means that attempts to measure the job creating impact of particular policies must look beyond their manufacturing sectors and realise that extra manufactured exports directly creates service sector jobs. Eventually, the topline message is that governments should shift their thinking on industrial policy. On one hand, it is no longer just industry that need to be addressed, and on the other hand, the impact of a successful industrial policy be felt far beyond industry.

Economic Globalization and Fluctuations: How Does Trade Induce Output Comovements? (Hitoshi Sato)

The recent development of international production sharing may affect aggregate economic performance. Such an example is the Great East Japan Earthquake in 2011 that paralyzed production activities in some foreign countries because international supply chains were damaged. This paper studies the extent to which international production sharing may affect the business cycle synchronization between two countries. While the linkage between international trade and business cycle synchronization has been studied mainly from the perspective of macro economic issues, such as the criteria of currency unions (e.g., Frankel and Rose 1998), trade in intermediate goods recently draws attention as an explanation of increasing business cycle synchronization (e.g., di Giovanni and Levchenko 2010). In short, the existing studies, however, provide a mixed result on the linkage between trade and output synchronization.

This paper examines the extent to which international production sharing may affect business cycle synchronization between two countries by constructing measures of bilateral trade intensity (BTI) by end-use. We find that the BTI in intermediate goods is positive and significant in cross-section regressions. However, once we introduce the country-pair fixed effect, the effect of bilateral trade in intermediate goods on business cycle synchronization is substantially weakened or even disappears. This result is robust when we use an alternative data set and introduce instrumental variables in to the regression.

The estimation results show that international trade as a whole may increase business cycle synchronization, but it is largely due to trade in consumption goods, rather than intermediate goods. This result suggests that the linkage through final demand, a classical channel of business cycle synchronization, is more important than that through international vertical specialization.