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Unveiling the true value of across-strait trade: The global value chain approach

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ABSTRACT

Due to the pervasive nature of value chains, an increasing amount of imported intermediate components and raw materials from other countries are entangled in Taiwan's exports to Mainland China. This circumstance leads to odd across-trait bilateral trade amounts and surpluses favorable towards Taiwan. The purposes of this paper are applying Johnson and Noguera (2012) to extricate value-added exports earned by Taiwan from China and Wang, Wei, and Zhu (2013) to decompose Taiwan's gross exports to China into various meaningful components. The two issues are related to trade in value added and value added in trade. Specifically, the former explores the value added embedded in the source country's exports to the absorbing country as final demand, regardless of whether those goods are directly or indirectly arriving at the absorbing country. The latter only looks where the value added is originated regardless of where it is ultimately absorbed. We show both concepts aim to measure a country's value added from its trades, but from different angles. Each has its own distinct meaning. They are related, but not completely the same.

The inter-country input–output (ICIO) table used in this paper comes from the World Input–Output Database (WIOD) (Timmer et al., 2015 and Dietzenbacher et al., 2013). Empirical results indicate that Taiwan's export values to Mainland China shrink by 64.3% when bilateral trades are measured in value-added terms. Furthermore, Taiwan's trade surplus toward China also decreases by 65.2% under this measure. From the viewpoint of value added in trade, the share of value added in Taiwan's gross exports to China continued to decrease and reached 50.9% in 2011, while the components of foreign value added and double counted terms kept growing in recent years.

1. Introduction

As the tension eases across the Taiwan Strait, the economic ties between Taiwan and Mainland China have strengthened over the recent years. Powered by China's vast consumer market and rapid industrial demand, the across-strait bilateral trades soared drastically. According to customs statistics by the Ministry of Finance, Taiwan's exports to Mainland China (including

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Hong Kong) amounted to US$ 121.2 billion in 2013, which was higher than the exports to the U.S., and accounted for 39.7% of Taiwan's total exports. Taiwan enjoyed a US$ 77.0 billion trade surplus with China, which was more than double of Taiwan's overall surplus. Despite the close economic relationship between Taiwan and China, concerns about too much reliance on China deepen in Taiwan's society. Indeed, these superficial trade statistics using conventional methodology have gradually revealed deficiencies in signaling external competitiveness, while exaggerating China's influence on Taiwan. As such, the purpose of this paper is to unveil the true value of across-strait trade.

According to the existing practices of customs statistics, the exported and imported goods are recorded every time they enter or exit the border. With global value chains (GVCs) flourishing in recent years, these conventional trade statistics not only fail to highlight the vertical specialization among different countries, but also distort the measurement of a country's competitiveness (Backer & Miroudot, 2012).

Value chains are a process that manufacturers adopt to transform products from their initial state to end use (Gereffi & Fernandez-Stark, 2011). In the past, most producers conducted all production process in one location. Nowadays, more and more firms split their value chains into various parts such as design, production, sales and so on, and relocate them to different regions. The main drivers of GVCs are declining transport, information and communication costs, the sharp increase in technological progress, lower political and economic barriers to trade, and easier capital flow over the last two decades. The rise of GVCs has contributed to widespread geographical fragmentation of production and outsourcing in the world economy. As every country specializes in only a few tasks instead of the whole production chain, exported goods may require significant intermediate imports. Thus, much of the revenue, or value added, from selling exports may accrue abroad to reflect purchases of intermediate imports required for production, leaving only marginal benefits in the economy exporting the final products. Under such a circumstance, it is obvious that gross recording of trade flows can be misleading when one crudely relates conventional trade statistics to domestic value added and national income, or its components such as profit or wage and by extension, employment.

A well-known case study that clearly illustrates the aforementioned issue relates to the production of an Apple iPod (Dedrick, Kraemer, & Linden, 2010). This study shows that of the US$ 144 Chinese factory-gate price of an iPod, less than 10% contributed to Chinese value added, with the bulk of the components being imported from Japan, the U.S. and Korea. As a final assembler of products such as iPods, China's export values encompass those intermediate imports, leading to high export amounts and a huge trade surplus with the U.S. A recent WTO report calculated that the US–China trade balance would be about 40% lower if estimated in value-added terms.

A similar phenomenon takes place in Taiwan's trade with Mainland China. This paper tries to uncover the true trade value between both sides of the Taiwan Strait from two different angles: one explores the value added acquired by Taiwan in its exports to China, the other decomposes the export values from Taiwan to China into various meaningful components. The two issues are related to trade in value added and value added in trade respectively (Stehrer, 2012) . More specifically, the former investigates the value added embedded in the source country's exports to the absorbing country as final demand, regardless of whether those goods are directly or indirectly arriving at the absorbing country. The latter filters out the value-added contents within bilateral trade and only looks where the value added is originated regardless of where it is ultimately absorbed.

For this analysis, we follow two papers to investigate the aforementioned two issues: Johnson and Noguera (2012) and Wang, Wei, and Zhu (2013). Johnson and Noguera (2012) establish the definitions of value-added exports (VAX) and VAX to exports ratio (VAX ratio), which are widely cited in the literature. Antras (2013) refers to the VAX ratio as "state of art" and "an appealing inverse measure of the importance of vertical specialization in the world production." We select VAX as it can reveal the true value underlying conventional exports. We further show that VAX can be easily calculated by applying Leontief's forward-linkage based effect.

Regarding the decomposition of export values, Wang et al. (2013) propose a new method that provides a wealth of information non-existent prior. Foster-McGregor and Stehrer (2013) suggest a simple solution by considering both exports and imports simultaneously. By multiplying three matrices, i.e. the diagonalized value added coefficients of each country, the Leontief's inverse from the global input-output matrix, and the diagonalized trade matrix containing exports and imports (with a minus sign) of the target country, one can obtain the value added content of trade attributable to foreign and domestic production. However, Foster-McGregor and Stehrer (2013) overlook the returned value added problem. To tackle this issue, Koopman, Wang, and Wei (2014) first break down gross exports into nine items. While Koopman et al. (2014) already have many useful applications, an important limitation to the approach is that the gross trade decomposition is only done at the aggregate level. Wang et al. (2013) provide a new and comprehensive methodological framework that decomposes bilateral sector level gross exports into 16 items, which can also be grouped into four main categories, i.e. the domestic value added earned from abroad (DVA), value added first exported but eventually returned home (RDV), foreign value added (FVA), and pure double counted terms (PDC). In this paper, we apply the methodology of Wang et al. (2013) in analyzing these components within the across-strait trade.[1]

[1] Recently, Los, Timmer, and de Vries (2016), using the hypothetical extraction approach, prove that domestic value added in exports can be computed based on information from national input-output tables only. However, global input–output tables are still required to decompose domestic value added in exports further, for example to measure value added exports introduced by Johnson and Noguera (2012). This is also true for any analysis of domestic value added in bilateral export flows.