Weighing up Thailand's benefits from global value chains

Chantavarn Sucharitakul, Sukjai Wongwaisiriwat, Teerapap Pangsapa, Warawit Manopiya-anan and Warittha Prajongkarn [1]

Abstract

As an export-oriented economy, Thailand is often faced with the question whether international trade yields real and sustainable benefits to its citizens, over and beyond what is reflected in its GDP figures. This paper attempts to answer that question, using the trade in value added (TiVA) approach to overcome the shortcomings of trade statistics. From a global perspective, we find that, since the early 2000s, the centre of global value chains (GVCs) has shifted from the G3 to China. From 2005 onwards, China emerged as a key player in GVCs, effectively replacing Japan as one of the top three centres for GVCs and even surpassing the United States in this ranking by 2011. Nevertheless, in terms of value added flows, China remains on the receiving end, while the United States maintains its status as the dominant exporter of value added.

In Thailand's case, we find that most manufacturing sectors lie towards the end of GVCs, and therefore export figures are likely to be large, even on a net basis. This is an ongoing concern for Thailand, given that the growing bilateral trade surplus continues to put upward pressure on the domestic currency. On the domestic front, we also document the diminishing benefit from backward participation, as labour-replacement automation penetrates into more sectors, not least in the electronics sector, where its impact is already apparent.

Key words: International trade, global value chain, forward participation, backward participation, value added.

JEL classification: F100.

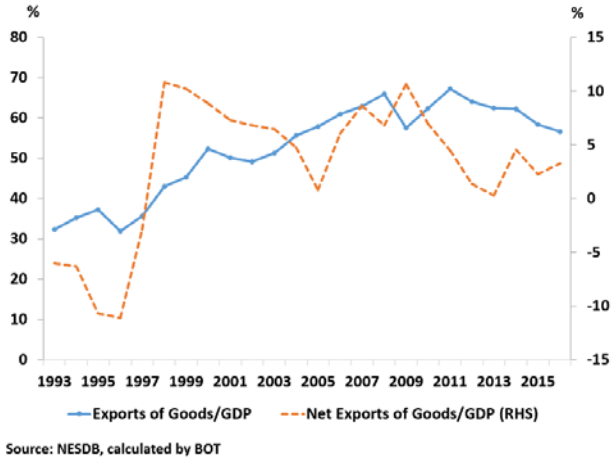
[1] Bank of Thailand

Introduction

Thailand has always been considered an export-oriented economy. During the past decade, exports of goods contributed around 60% of the country's GDP on a gross basis, or 5% on a net basis (Graph 1). Although exports play a significant role in boosting GDP, policymakers, including central bankers, are often asked whether the country's involvement in international trade yields real benefits to its citizens, particularly in terms of employment, local content utilisation and technology transfer.

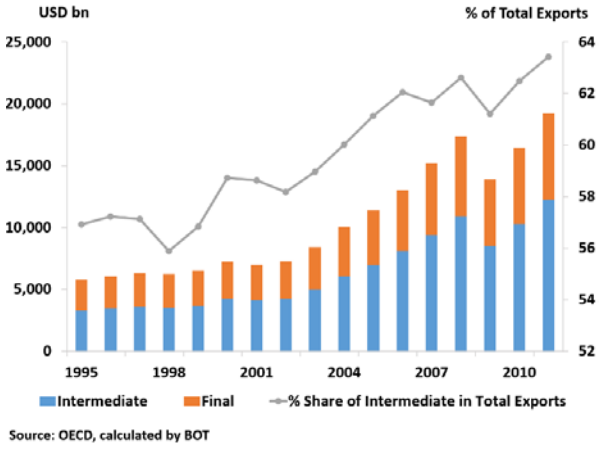
This paper attempts to answer that question, by offering a way to gauge the net benefits accruing to Thailand in return for its participation in international trade in recent decades. As seen from Graph 2, global exports have increased continuously since 1995. During the same period, trading of intermediate goods has risen by more than that of final goods – reflecting Thailand's growing participation in global production chains.

Thailand's external sector — Graph 1



Source: NESDB; BOT calculations.

Global exports — Graph 2



Source: OECD; BOT calculations.

As production processes become fragmented and involve more countries, conventional trade-based measures become increasingly subject to the double-counting problem, as they may record the value of intermediate inputs bought and sold along the production chain several times over. This can lead to a situation where country A records a huge trade surplus with country B, but in fact the latter indirectly exports a considerable value of intermediate goods to the former through other countries in the production chain. Unfortunately, the bilateral trade surplus calculated by conventional trade statistics does not reflect those indirect activities, with the result that decision-making based on these figures may encourage a protectionist response. Moreover, the use of trade-based measures also makes it more complicated to disentangle the net domestic contribution, since a country acts simultaneously as a user of foreign inputs and a supplier of intermediate goods used in other countries' exports.

To overcome the shortcomings of trade statistics, the analysis in this paper adopts the "trade in value added" (TiVA) approach, using the OECD's Inter-Country Input-Output (ICIO) database.

The first part of the paper outlines key stylised facts on the evolution of global value chains (GVCs). The second focuses on Thailand's participation in GVCs in terms of sector variations. We pay particular attention to the electronics sector, which accounts for a sizeable share of the country's exports. The last part discusses the implications for future trade and industrial policies.

Part I: Evolution of GVCs

Based on trade in value added (TiVA) statistics calculated from the ICIO, we find that the centre of GVCs has shifted from the G3 to China since the early 2000s.

From the trade flows in value added terms in Graph 3,[2] three observations can be made. First, the United States, Germany and Japan lay at the centre of GVCs during from 1995 to 2000. This finding is consistent with Gereffi (2015), who notes that several US and European manufacturers became huge global players in the 1990s, thanks to their skills in global sourcing. Second, it can be seen that, around 2005, China replaced Japan as one of the top three centres for GVCs, even surpassing the United States in size by 2011. However, despite China's emergence as a key player in GVCs, the United States remains the only dominant exporter of value added, while China is the largest recipient.

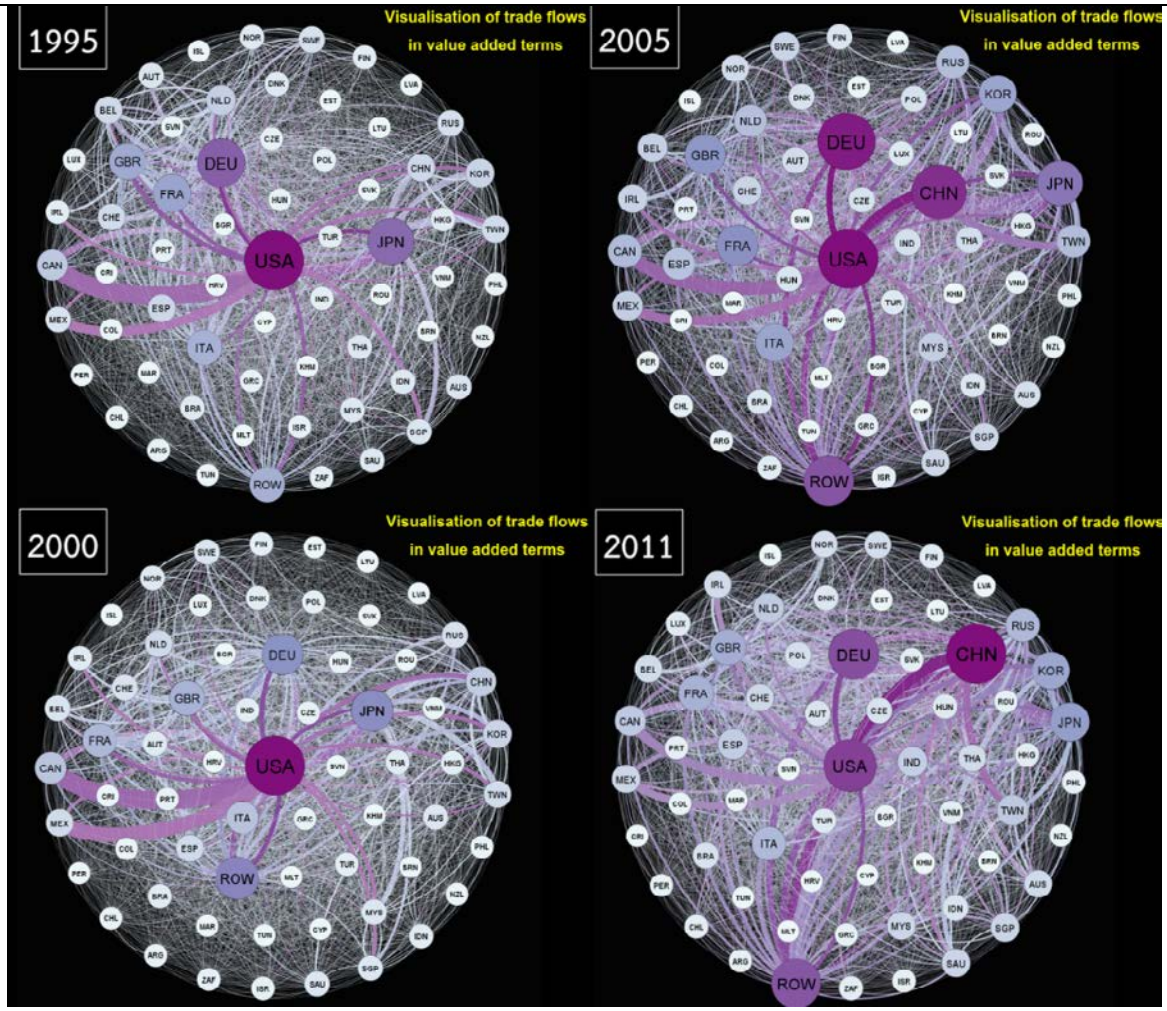
The global shift in trade structures raises the question of how smaller countries are involved, particularly in terms of their positioning within GVCs. The following part of the paper will clarify key concepts that will be useful in answering this question.

In joining a GVC, countries typically expect to reap benefits through the process of industrial deepening, by increasing the share of domestic value that is added to exported products. When this is the case, the country is said to have a high *forward participation*. On the other hand, if a country's exports contain a high imported content, it is considered as having a high *backward participation*.

[2] The flows out (clockwise) and in (counterclockwise) of each node (country) represent, respectively, exports and imports in value added terms of that particular country. The size of the flows represents the magnitude of value added, and the size of the nodes represents the aggregate value of flows in and out of that particular country.

Flows of trading activities in value added terms

Graph 3



Although countries often aim to raise the share of domestic value added (DVA) in their exports, which results in higher forward participation, it is worth emphasising that backward participation is not necessarily undesirable, provided that local suppliers manage to absorb production technology from foreign manufacturers, through the process of importing foreign inputs (Blalock and Gertler (2007)). Moreover, backward linkages in GVCs can help promote economic growth and the development of both local suppliers and facilities that will lead to further investment, jobs creation, and the improved competitiveness of downstream industries, as documented by Kuroiwa (2017). In this paper, we calculate **the participation index** by summing both types of participation – backward and forward – for each country investigated.

Based on the same concept, we also calculate a **positioning index**, as a ratio of forward to backward participation. Countries with a ratio of greater than one are said to be positioned *upstream*, while those with a ratio of less than one are *downstream*. For the same reason as above, a downstream positioning is not necessarily

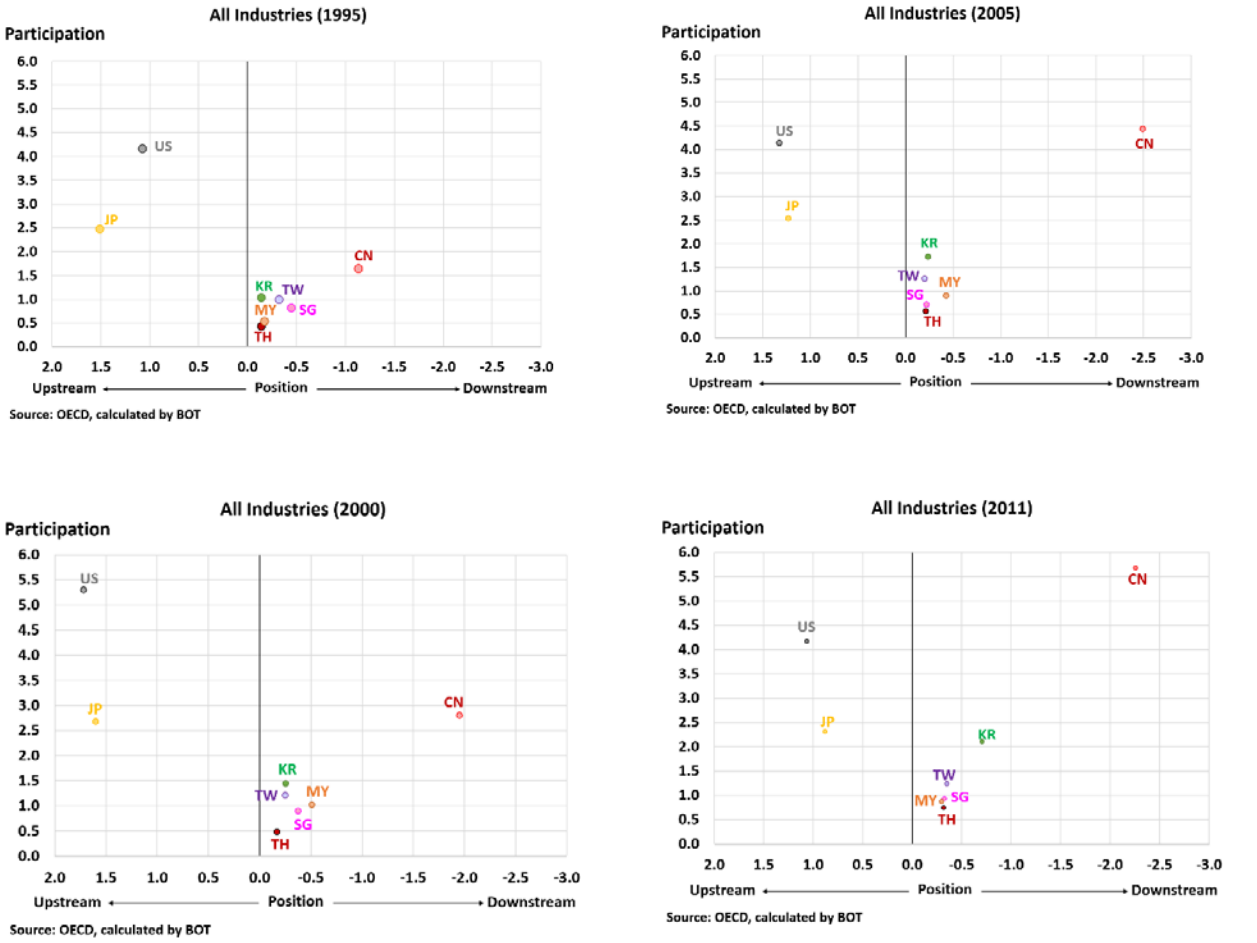
unfavourable. In this paper, we investigate the relative positioning of countries only to draw the implications for future supply side policy.

Over the past two decades, the relative positioning of countries along GVCs has not changed markedly, with the exception of China's.

Graph 4 puts together the two indices outlined above – participation and positioning. From the chart, it can be seen that throughout the observation period (1995–2011), the position of the G3 countries remained upstream vis-à-vis key Asian countries, including China. Moreover, it is apparent that China has continuously moved further downstream over time. In terms of participation, China also records the biggest change, while the G3 and other Asian countries do not witness significant movement.

Countries' participation and positioning on the global value chain

Graph 4



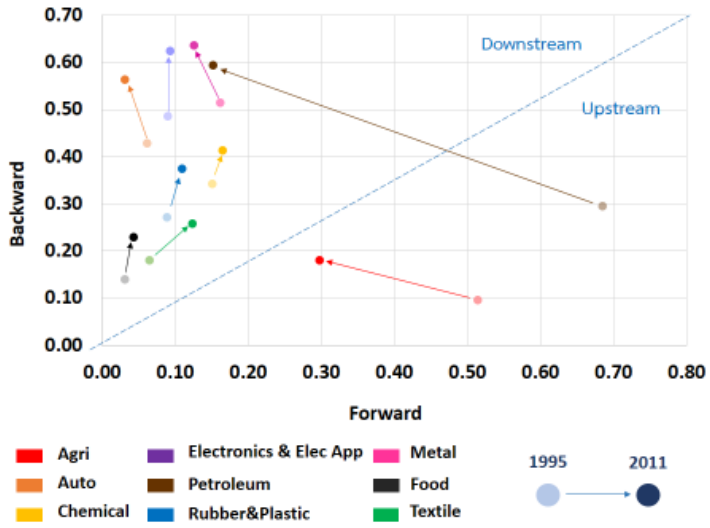
Part II: Thailand's experience within GVCs

Although the overall participation index of countries in Asia ex-China has not changed substantially, the nature of participation, ie the level of backward and forward participation, may have changed over time. Moreover, this characteristic may vary from sector to sector. We investigate these issues below.

In Thailand's case, the degree of downstream positioning is driven by almost all industrial sectors. Over time, the increase in the degree of that positioning has been caused by increasing backward participation rather than falling forward participation.

As seen from Graph 5, most manufacturing sectors in Thailand are positioned downstream, as backward linkages are relatively higher than forward ones. Agriculture, as expected, falls on the upstream side, as agricultural products have a relatively low import content. At the same time, they can be exported in raw form to be used in various agro-manufacturing chains globally. Over time, most sectors have remained more or less in the same position that they occupied two decades ago. In the case of petroleum, which is an exception, we find that the marked shift in positioning from upstream to downstream followed the government's removal of conditions that discouraged foreign companies from pursuing refinery projects in Thailand. As a result, in the span of just a few years after 1990, domestic refinery capacity almost tripled, while imports of refined products fell proportionately.

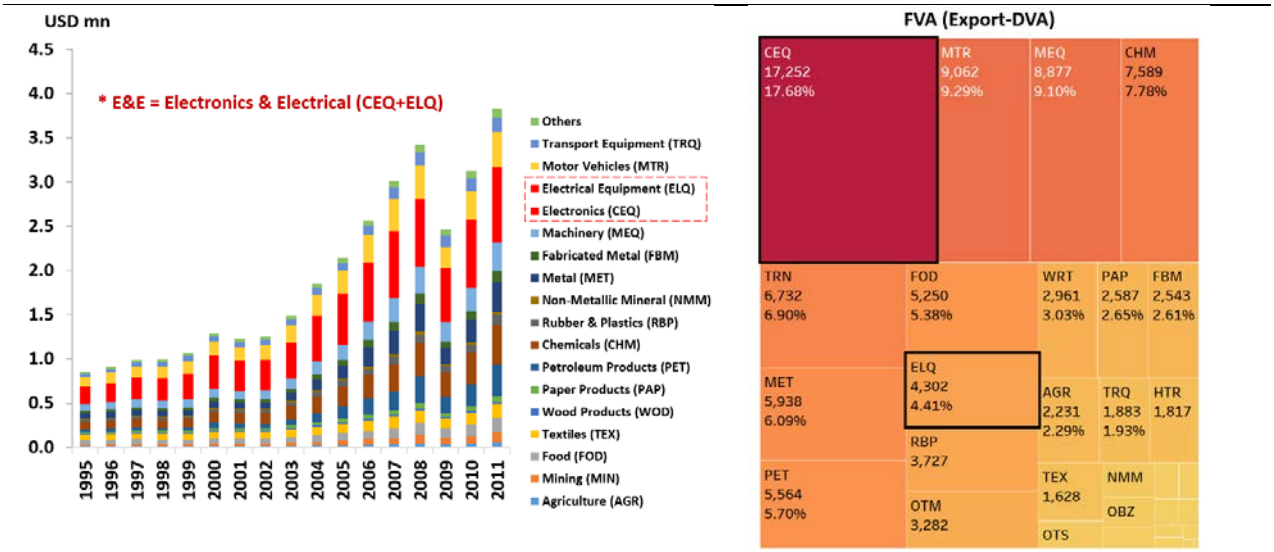
Evolution of Thailand's key manufacturing sectors in GVCs — Graph 5



In view of each sector's width and breadth, it is impossible to cover all sectors in this short paper. As a case study, we investigate the electronics and electrical appliances sector, as this sector seems to be more prominent in the global production network than other sectors are. As Graph 6 shows, the sector accounts for a larger share of total foreign value added than do the other sectors. The same applies to

Thailand. In 2011, electronics and electrical appliances combined represent around 22% of the total foreign value added that the country receives from abroad (Graph 6, right-hand table).

Foreign value added — Graph 6



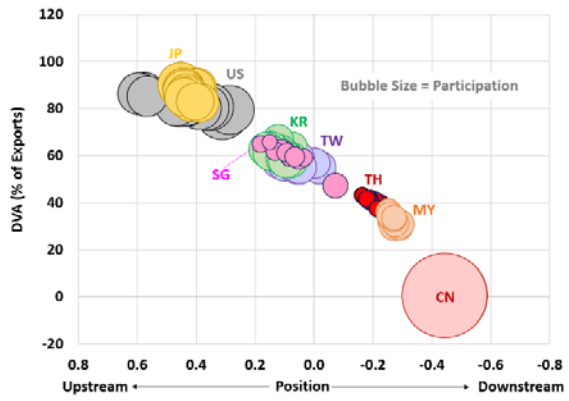
Source: OECD, BOT calculations.

Thailand's electronics sector generates a lower share of domestic value added to exports than do those of more industrialised Asian peers.

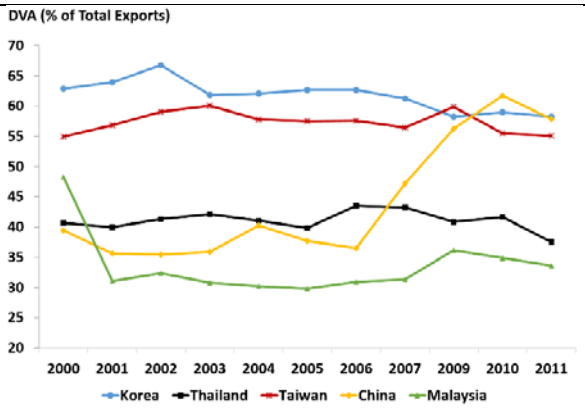
From Graph 7, it can be seen that Thailand's electronic products sector accounts for a lower share of domestic value added (DVA) than do its North Asian counterparts in Korea and Chinese Taipei, for example. The right-hand chart also shows that Thailand's DVA has been stagnant over time, at around 40% of total value added generated in the production process. Moreover, firm interviews indicate that the majority of such DVA is generated through labour employment, mostly on the assembly line, rather than through domestic technological know-how. As seen from Graph 8, employment in this industry has grown faster than in the overall manufacturing sector since the early 2000s.

Nevertheless, recent research by the Bank of Thailand (Leepipatpiboon and Thongsri (2018)) indicates that, among all industrial sectors, employment in the electronics sector is most at risk from automation technology. During the past four years, Thailand has witnessed strong growth in electronics production. However, electronic firms have reported increasing purchases of robots that correspond to falling hours of employment (Graph 9). Recent firm visits and internal studies also indicate that a similar pattern has started to emerge in the automotive, rubber, and plastics sectors – which together represent almost a third of Thailand's industrial output. In this light, the benefit in terms of job creation that Thailand receives from its backward participation in GVCs is likely to diminish further.

Domestic value added of selected countries, in E&E sector Graph 7

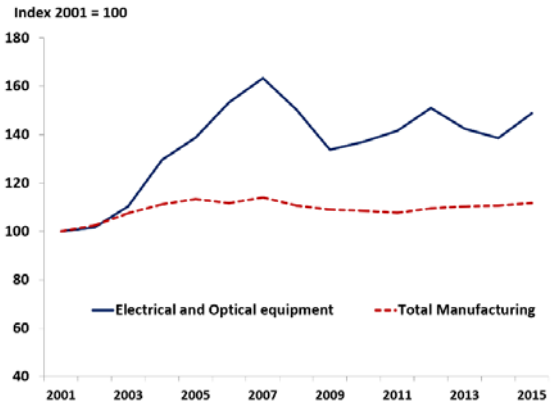


Source: OECD, calculated by BOT



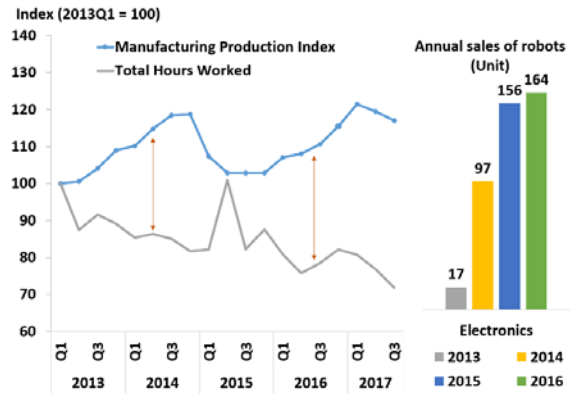
Source: OECD, calculated by BOT

Employed persons in Thailand Graph 8



Source: Thai Labor Force Survey.

Automation in the manufacturing sector (Index 2001 = 100) Graph 9



Source: National Statistical Office of Thailand, Office of Industrial Economics (Thailand); International Federation of Robotics 2017.

Part III: Conclusion

While trade statistics help us measure the impact of GVCs on GDP, the TiVA approach used in this paper allows us to visualise where a country is positioned along the value chain – a more meaningful input when formulating industrial policy. **In Thailand's case, we find that most manufacturing sectors lie toward the downstream end of the chain. Thus, export figures are likely to be large, even on a net basis**. In

other words, **the so-called double-counting problem tends to punish countries which are positioned downstream more heavily than it does those with upstream positioning.** As witnessed in recent years, a growing bilateral trade surplus has put upward pressure on the domestic currency, which has been an ongoing concern for Thailand on the external front.

On the domestic front, one obvious concern relates to the nature of backward participation in Thailand. As documented by several research studies, one of the key benefits from backward participation is job creation. In future, however, production processes are likely to become increasingly automated, not least in the electronics sector, where labour-replacement automation is already present on a significant scale. As such disruptive technology penetrates into more sectors, the conventional benefit from job creation is likely to diminish over time.

Looking ahead, policymakers should therefore induce local players to reap benefits from backward participation that are more sustainable, particularly in terms of technological know-how, in order to raise the share of DVA in exports. In fact, government policy is already moving in this direction, under the banner of the "Thailand 4.0" programme. In particular, the Board of Investment – the official body responsible for promoting investment in Thailand – has recently revised its investment promotion schemes to offer extra incentives for firms that adopt advanced technologies or belong to the targeted industries which it deems critical in upgrading the country's manufacturing sector. In line with the findings of this paper, this marks an important shift in policy orientation away from creating employment and utilisation of raw materials, and towards developing the absorptive capacity of domestic players. Indeed, this is a prerequisite if Thailand is to avoid a two-speed economy where the external sector flourishes while the domestic sector withers.

References

Ahmed, S, M Appendino and M Ruta (2015): "Depreciations without exports? Global value chains and the exchange rate elasticity of exports", *World Bank Policy Research Working Papers*, no WPS 7390, Washington DC.

Blalock, G and S Gertler (2007): "Welfare gains from foreign direct investment", *Journal of International Economics*, vol 74, no 2, pp 402–21.

Gereffi, G (2015): "Global value chains, development and emerging economies", *Inclusive and Sustainable Industrial Development Working Paper Series*, WP 18, United Nations Industrial Development Organization.

Koopman, R, W Powers, Z Wang and S-J Wei (2010): "Give credit where credit is due: tracing value added in global production chains", *NBER Working Papers*, no 16426.

Kuroiwa, I (2017): "The automotive value chain in Thailand", *ERIA Discussion Paper Series*, DP-2016-33, Economic Research Institute for ASEAN and East Asia.

Leepipatpiboon, P and N Thongsri (2018): "Automation in Thailand and its effects on labor market", Bank of Thailand, January, www.bot.or.th.

Lopez Gonzalez, J, P Kowalski and P Achard (2015): "Trade, global value chains and wage-income inequality", *OECD Trade Policy Papers*, no 182, OECD Publishing, Paris.

World Economic Forum (2012): "The shifting geography of global value chains: implications for developing countries and trade policy", *Global Agenda Council on the Global Trade System*.