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Production network-based economic
interdependence in East Asia,
and its effects on international politics

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Abstract

The fragmentation of production and the emergence of regional production networks and Global Value Chains has garnered increased attention in study of International Relations and International Political Economy in recent years, as state actors began to conceptualize these phenomena as both security risks in light of the vulnerabilities entailed in dependence on foreign inputs and foreign supply chains, and a source of political power, allowing states with a central role in these networks to exploit the asymmetrical nature of dependence.

This dissertation aims to contribute to the emerging literature on this topic by investigating how the economic architecture in East Asia constrains or augments international political action under the conditions of production network interdependence. To answer this question, the study investigates the main determinants of trade relations in East Asia to unearth how states influence regional commerce; analyzes the position and dependencies of regional states in Global Value Chains; and looks at whether these dependencies are affected by political relations.

The dissertation found that domestic factors remain important in explaining regional trade patterns, and international political frictions have so far failed to change the patterns of production in East Asia, showing that while on the one hand the nation state remains the decisive actor in international commerce, the robustness of trade and production networks is quite considerable in the face of political adversity. This shows that production network-based interdependence provides a substantial limit on the effectiveness of exercising economic coercion among great powers. On the other hand, the study also concludes that while economic coercion is increasingly less able to secure political aims, it nevertheless produces substantial economic costs both for the target and the coercer under the conditions of production network-based interdependence.

Keywords: International relations, Global Value Chain, production network, interdependence, regionalism

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List of Abbreviations

ABMI	Asian Bond Market Initiative
ACIA	ASEAN Comprehensive Investment Agreement
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AEC	ASEAN Economic Community
AFAS	ASEAN Framework Agreement on Services
AFTA	ASEAN Free Trade Area
ASCC	ASEAN Socio-Cultural Community
ASEAN	Association of Southeast Asian Nations
APSC	ASEAN Political and Security Community
APT	ASEAN Plus Three
ATIGA	ASEAN Trade in Goods Agreement
BRI	Belt and Road Initiative
CAFTA	China–ASEAN Free Trade Agreement
CEPT	Common Effective Preferential Tariff
CLMV	Cambodia, Laos, Myanmar, Vietnam
CMI	Chiang Mai Initiative
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
EAEC	East Asian Economic Caucus
EAEG	East Asian Economic Group
EAS	East Asia Summit
EU	European Union
FBIC	Formal Bilateral Influence Capacity Index
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
GVC	Global Value Chain
IMF	International Monetary Fund
IO	Input-Output

IPE	International Political Economy
IPN	International Production Network
IPR	Intellectual Property Rights
IR	International Relations
JETRO	Japanese External Trade Organization
MNE	Multinational Enterprise
MRIO	Multiregional Input-Output Database
NAFTA	North American Free Trade Agreement
NMI	New Miyazawa Initiative
NTB	Non-tariff Barrier
OECD	Organisation for Economic Co-operation and Development
RCEP	Regional Comprehensive Economic Partnership
PAFTAD	Pacific Trade and Development Conference
PECC	Pacific Economic Cooperation Council
TiVa	Trade in Value-added Database
TPP	Trans-Pacific Partnership
US	United States of America
USMCA	United States–Mexico–Canada
VA	Value-added
WDI	World Development Indicators
WTO	World Trade Organization

1 Introduction

1.1 Production network interdependence in East Asia

East Asia had experienced an economic development process of historical scale over the past decades and emerged in the 21st century as 'Factory Asia', a global center for manufacturing (WTO & IDE-JETRO, 2011, pp. 14-15) and an increasingly important consumer market as well. As a result, after two centuries of diverging economic fortunes between Europe and North America and the rest of the world since the Industrial Revolution, referred to as the great divergence (Pomeranz, 2000), from the 1960s onwards, the world has been witnessing what is now termed as the 'Great Convergence' (Baldwin R. E., 2016), a rapid reduction in the inequality of the international distribution of wealth mostly due to the catching up of emerging economies in East Asia. This phenomenon has elevated East Asia's global political standing and led to observers expecting the 21st century to be an 'Asian century,' or in other words, an era where international politics and the global economy is increasingly dominated by (re-)emerging Asian powers (Kawai, 2018).

The economic transformation behind such expectations was achieved in large part through harnessing international trade, Foreign Direct Investment (FDI) and the increasingly complex global division of labor. Regional economies pursued trade-based growth strategies and relied heavily on foreign markets and foreign inputs throughout the course of their development (Kimura, 2006). These trade-based policies in turn helped to sow the seeds for the emergence and expansion of international production networks (IPN) in the manufacturing sector starting in the late 1980s with the rapid increase in the relocation of production by Japanese Multinational Enterprises (MNEs) to low-wage Southeast Asian economies and China. As the production of manufactured goods was becoming increasingly fragmented, that is, separated into numerous production stages and divided among a growing number of suppliers located in different countries (Jones & Kierzowski, 1990), a sophisticated regional division of labor has emerged in East Asia. In this setting, a diverse array of plants and companies in a number of different regional economies began to collaborate in the production of manufactured goods, trading a large volume of intermediary products (parts and components) among each other (Kimura & Ando, 2005).

As a result of regional production network development, the share of intra-regional trade within the Association of Southeast Asian Nations (ASEAN) plus Japan, China, and South Korea (the ASEAN Plus Three, or APT) rose to 50 per cent by 2012 and has held steady since then, while the region's share of world exports exceeded 27 per cent in 2017, up from 16 per cent in 1990. Underscoring the importance of trade in the economic development of APT members, exports as a share of the Gross Domestic Product (GDP) of the group rose from 16.7 per cent in 1990 to 36 per cent in 2008 and has stabilized around 30 per cent since then, even in the face of the slowdown in global trade in the aftermath of the 2008–2009 Global Financial Crisis. The APT's broader economic fortunes mirror its dominance in exporting: the share of the group in world GDP has risen from 18.5 per cent in 1990 to 27.5 per cent in 2018.

Production network development *per se* is not a phenomenon exclusive to East Asia. German and French industrial firms operate factories in, and source components from, all over Central and Eastern Europe; US firms outsourced most of their assembly operations to Mexico, while retained some higher value-added parts of production within the United States. Nor is the establishment of production networks a solely regional phenomenon: electronics assembly lines in Europe and the US depend increasingly on parts and components sourced from East Asia, while German firms export automobiles assembled in the US to Asia. A landmark study estimated that intermediary inputs constitute as much as two-thirds of world trade (Johnson & Noguera, 2012), which means that production sharing produces a higher value of economic exchange than trade in finished goods and primary products combined. Consequently, the World Bank (2020) has recently declared that we are witnessing the “Age of Global Value Chains” (GVC).

Against this backdrop, production network development in East Asia is often considered a regional manifestation of a global phenomenon, and regional networks are categorized as hubs and spokes in GVCs. On the one hand, East Asian producers are deeply embedded in GVCs: regional firms and factories are important sources of inputs for manufacturing firms in other regions; regional production is heavily dependent on extra-regional imports of raw materials, energy, as well as advanced machinery and services; and a large part of East Asian manufacturing products end up being consumed in extra-regional markets, most notably in the United States and the European Union.

On the other hand, according to the World Bank (2020, p. 24), East Asian production networks are more regional than global in character, meaning that the share of regional GVC trade in total GVC trade is higher than the extra-regional share, while

the rate of regionalisation has been expanding since 1990. Moreover, East Asian production network development exhibits important peculiarities compared to other regions.

First, both the regional spread and the penetration of East Asian production networks are significantly wider and deeper than in other parts of the world. East Asian production networks tie together production bases in a large number of countries and involve a high number of back-and-forth transactions between countries of different income levels. In contrast, production networks in North America and Europe usually involve plants in two or three countries on average, with lesser amounts of back-and-forth transactions, and generally lower levels of income disparity among participating countries (Kimura, 2006; Kimura & Obashi, 2011).

Second, while production sharing is central to the development strategies of an increasing number of countries from Mexico to Hungary, East Asia can be considered unique in the regard that participation in regional trade and production is a cornerstone of the domestic economic policies of almost all regional states.

Third, unlike in Europe or Northern America, East Asian regional production network development and more generally the expansion of East Asian regional trade and investment started in the 1980s and continued throughout the 1990s without the support of region-wide, rules-based international institutions prescribing broad and deep trade and investment liberalization, such as the European Union (EU) and the preceding forms of European integration, or the North American Free Trade Agreement (NAFTA) and its successor, the United States–Mexico–Canada Agreement (USMCA). Instead, East Asian regional trade and investment ties had started to blossom due to what has been described in various strands of the literature as informal, market-led, bottom-up, *de facto* integration, or regionalization; in contrast to European and North American formal, state-led, top-down, *de jure* economic integration, or regionalism.

East Asian regionalism has been changing rapidly since the millennium, and the number and scope of regional institutions and problem-solving forums on both economic and political affairs has expanded, especially in the form of bilateral and ASEAN Plus One regional Free Trade Agreements (FTAs) and with the conclusion of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in 2018 and the Regional Comprehensive Economic Partnership (RCEP) in 2020, leading to some observers to declare that East Asian market-led regionalization morphed into

institution-led regionalism (Urata, Trends of FTAs in East Asia from the 1990s to the 2010s: defensive and competitive regionalism, 2019).

Yet the differences in the path taken in the beginning are still relevant in light of current challenges: as the development of transnational economic networks preceded international institutionalization, political bargaining related to the management of international interdependence faces a more complex trajectory than in regions of the world where the rules of intra-regional commerce established before the advent of production-sharing and GVCs.

1.2 Contestation of production network interdependence

The regional production networks and the global value chains those are embedded in are not only an increasingly dominant feature of the world economy but are also becoming more and more contested in international politics.

The first such contestation concerns the perceived disparities in the distribution of income and wealth stemming from globalization in general, and production sharing in particular. During the previous decade, the loss of manufacturing capacity, and with it low-skilled middle-income employment, has become a central political issue in developed economies. Some economic theorists posit that the rising inequality tied to the offshoring of production led to a backlash against liberal trade and economic policies (Rodrik, 2018). The most prominent recent example is that of former US President Donald J. Trump, who campaigned on a platform explicitly hostile toward economic liberalism, and once in power, levied retaliatory import tariffs, which at first targeted the steel industry and then gradually expanded to target a large share of Chinese imports. Due to China's central place in regional trade and production, these measures had ripple effects all over East Asia, underscoring the political threat to the operation of transnational production (Kimura, 2021).

While at present the backlash against liberal trade policies is a largely extra-regional phenomenon, and such political forces are comparatively weaker in East Asian states—albeit not non-existent, such as former Prime Minister Mahathir Mohamad in Malaysia or the anti-chaebol political forces in South Korea—, the distributional and coordination dilemmas inherent in increased integration of the global economic architecture pose longer-term vulnerabilities to regional economies reliant on trade and GVC participation. This has been evident from the fact that the tariffs have remained in

place even after the Trump administration left office in January 2021, and the incoming administration of Joseph Biden continued to introduce further protectionist measures, such as the strengthening of ‘Buy American’ rules designed to discriminate *vis-à-vis* foreign products in government procurement (White House, 2021b).

A second source of contestation has come to the fore during the COVID-19 pandemic in 2020–2021, when disruptions in the supply chains of essential medical equipment, as well as foodstuff and daily necessities demonstrated the potential vulnerabilities outsourcing can pose in the event of unforeseen supply and demand shocks (Antràs, 2021; Kimura, 2021; World Trade Organization, 2021). While such vulnerabilities have been discussed by students of International Relations (IR) and International Political Economy (IPE) for decades (Keohane & Nye, 1977), state actors appear not to have taken these vulnerabilities seriously up until now. The development of GVCs and regional production networks has followed firm-level economic considerations related to lowering production costs and gaining efficiency (Kimura & Ando, 2005; Antràs & Yeaple, 2014, pp. 55-56), while national-level political and strategic considerations related to supply chain vulnerabilities and national security have not played a significant role in the geographical distribution of production, except in some specific areas closely linked to national defence and non-proliferation. To address the perceived shortcomings stemming from this, political actors have been recently vying to address wider vulnerabilities stemming from outsourcing, and strategic revaluations of supply chain security are being conducted in the two largest market for East Asian manufacturing goods, the United States (White House, 2021a) and the European Union (European Commission, 2021a), among others.

While these concerns have been amplified by the COVID-19 pandemic, they had already been present in the political discourse in the preceding years due to a third, structural force: the rise of China and the emergence of what has been termed ‘strategic competition’ by US President Joseph Biden between the United States and China. One consequence of the emergent US–China strategic competition is that the scope of economic activities conceptualized as potential strategic vulnerabilities has expanded and has come to include sectors such as civil telecommunications, machinery manufacturing, and even the mining and refining of minerals central to the production of electronics products (Foot & King, 2019). This shift in perception has led to calls for the decoupling of the two economies, and recent policies, on both ends—such as the raising of import tariffs, restrictions on FDI in strategic sectors, or targeted export controls preventing

Chinese companies from acquiring US technology, as in the case of Chinese telecom equipment manufacturer Huawei—aim to sever certain economic and financial ties among China and the US due to direct and indirect national security risks involved.

Under such conditions, economic interdependence can and does become ‘weaponized’ (Farrell & Newman, 2019), or in other words, nation states seek to extract political and economic gains from the vulnerabilities inherent in GVCs. As a result, issues related to GVC operations, such as access to state-of-the-art technology or reliance on foreign inputs, may those be Chinese upstream inputs or US intellectual property for the manufacture of certain essential technological products, are being treated as issues of economic security; and trade and economic policies are being crafted to reduce such vulnerabilities in China, the US, the EU, Japan, and other advanced economies.

Another consequence of China’s re-emergence as a pivotal actor in regional economic and political affairs concerns the institutional architecture of the regional and global economic order. As discussed in detail in the next section, scholars of international security posit that East Asian states are reacting with hedging and balancing strategies to the rise of China. Such strategies are not limited to issues of national security but are employed in economic policies and regional economic institutions as well (He K. , 2018; Koga, 2018; Yeo, 2020). Hence, the regional economic order is being reconfigured as a result of US–China competition, and

A fourth, exogenous threat to production network-based East Asian economic architecture is the structural slowdown in globalization and the rapid development of labor-saving technological changes, such as the adoption of automation in manufacturing industries, or the advances in machine learning and Artificial Intelligence, which have the potential to reduce the reliance on humans to operate factories (Antràs, 2021). According to a number of economic theorists, such advances may limit the scope of production network-based industrial upgrading in the 21st century (Rodrik, 2018), or at least would require states to employ a very different policy mix compared to those utilized in the previous decades by successful industrializers such as South Korea or Japan (Gereffi, 2014).

Since the negative externalities stemming from these developments threaten to upend the current growth strategies of emerging East Asian nations, managing the effects of exogenous technological change would necessitate increased international coordination; yet the very nature of this technological change is deeply intertwined with the aforementioned political contestations, for advanced economies are explicitly

promoting automation and other related technologies to reduce their reliance on imported inputs.

In summary, the elevation of the status of East Asian states in international politics is largely based on economic successes stemming from production network development. At the same time, the considerable depth and spread of regional production networks mean that the economic activities of most East Asian nation states are highly dependent on the economic activities of other states in the region; hence it can be inferred that East Asia has a high degree of economic interdependence. However, these production networks are increasingly seen as sources of vulnerability by both extra-regional and regional actors, which seek to reorient the structure of regional and transregional economic interdependence.

1.3 Conceptual issues in production network interdependence

For the reasons outlined in the previous section, the political contestation of the regional economic architecture is in direct interaction with the changing nature of regional and global power relations in the region. Hence, investigating the nature of these interactions is of fundamental importance for the study of regional economics as well as international relations.

However, contemporary production network-based interdependence and the complexity of economic and political linkages in a world economy dominated by fragmented production pose several novel conceptual and practical problems when it comes to analysing the present-day effects and potential future trajectories of these processes. While some of these issues have garnered increased scholarly attention in recent years, only parts of the conceptual puzzles have been explored.

1.3.1 The network effects of interdependence

The first such problem concerns the form of interdependence. While traditional theories of interdependence were based on a dyadic, country-level formulation of vulnerabilities and sensitivities (Keohane & Nye, 1977), production network interdependence or contemporary financial interdependence is not dyadic, but systemic. As production is fragmented, upstream and downstream activities are usually agglomerated in different regions. Especially in complex GVC activities, the number of border crossings involved during the production process has been increasing (Wang, Wei, Yu, & Zhu, 2017, pp. 32-36), and technology licensing means that even actors with no

direct participation in production play a fundamental role in the operation of such networks. Thus, vulnerabilities are not necessarily translated bilaterally. This is hardly a new observation, as some pioneers of IPE have already discussed the importance of ‘structural power’ in the 1980s (Strange, 1987). Nevertheless, research on structural and network aspects of power in the IR and IPE field has been limited in scope up until recently (Winecoff, 2020).

One practical consequence of the networked nature of interdependence is that traditional bilateral forms of economic coercion are becoming less effective under the current conditions. Consider the punitive tariffs levied by former US President Donald Trump in 2018 on Chinese imports. While these were certainly highly disruptive to the international trading system, they have not made a dent in either Chinese gross exports or US gross imports, and the costs of the tariffs were born in large part by American consumers and companies (Amiti, Kong, & Weinstein, 2021), as well as firms located in US allies due to the network effects of GVC disruptions (Solís M. , 2021). Similarly, recent punitive measures by China aimed to curb the imports from important Australian and Philippine industries levied limited economic costs on the target country, as the excess production shut out from the Chinese market was absorbed by other importers. The global market and the ability to reorganize trade flows thus dented the usefulness of direct economic coercion (Smyth, 2021; Luo, Sun, & Wan, 2020).

Another consequence is that systemic vulnerabilities are harder to identify and manage. Recent experience with supply chain bottlenecks during the global COVID-19 epidemic shows ample evidence for this. For example, disruptions in semiconductor fabrication in Malaysia due to epidemic prevention measures have caused delays in auto vehicle production in Hungary and made a dent in Hungarian GDP as a result, even though the bilateral economic interdependence between the two countries is meagre (Csatári, 2021). Softbank, a Japanese telecommunications and technology company and investment holding, has limited direct business exposure to the Chinese market, yet suffered billions of US dollars in losses through its investments in Chinese companies operating on the local market as a result of the recent sweeping regulatory overhaul of China’s e-commerce and online lending sectors (Fujikawa, 2021). Similarly, while Huawei has meagre direct reliance on US vendors for parts and components, its activities were nevertheless severely constrained after the US government banned companies from selling American semiconductor technology to the firm, for Huawei’s third-country

suppliers are heavily reliant on American inputs, especially patents and other intangible technologies used for the production and design of microchips (Whalen, 2021).

Huawei's example shows another important aspect of the networked nature of interdependence, which was pointed out by followers of the 'weaponized interdependence' research program. Instead of focusing on dyadic sources of political power, this strand of scholarship posits that production and financial networks have 'chokepoints' and 'panopticons' through which states can leverage their hubness in these networks to cut adversaries off from networks flows, or extract information advantages *vis-à-vis* adversaries (Farrell & Newman, 2019, p. 46).

One conclusion to be drawn from this is that power and leverage in economic networks are deeply asymmetrical and hierarchic (Farrell & Newman, 2019, p. 54). However, network effects can manifest in numerous ways. Huawei's case with semiconductors might show that technological prowess is a key chokepoint advantage. On the other hand, due to China's location advantages such as low-cost labour, low-cost energy, and lax environmental regulations, many of the so-called upstream GVC production processes are heavily concentrated in China, which makes the country central to sectoral production networks, from the mining and refining of rare earth minerals used in most electronic devices, to the manufacturing of active ingredients of pharmaceuticals vital for foreign producers (European Commission, 2021a). Hence while sectoral analysis in more advanced areas, such as in semiconductor fabrication, show that Chinese companies are heavily reliant on foreign technologies and machinery (OECD, 2019), foreign manufacturers are equally reliant on Chinese inputs in their GVCs for electronics and pharmaceuticals.

Thus, another conclusion that can be drawn from the networked nature of interdependence is that technology, market size, financial clout or hubness in production provide different countries with different forms of power. In this setting, power can stem from both qualitative and quantitative preponderance: chokepoint effects can be leveraged either through controlling a vital component of manufacturing; or through achieving hubness through cost-competitiveness created by economies of scale.

1.3.2 State power and domestic trade-offs

Another important aspect of the networked nature of interdependence for international politics concerns the ways through which state power can influence the

economic features producing the aforementioned network effects, and the trade-offs involved in coercive power politics in such a setting.

One such issue is that while IR and IPE naturally focus on the role of political and state actors, the recent decades saw a global wave of economic liberalization and deregulation, weakening the levers through which states can directly influence production decisions (Simmons & Elkins, 2004; Antrás, 2016). As previously noted, East Asian production network development followed a market-based logic in the beginning, as the relocation of production was achieved through the agency of MNEs seeking to minimize their production costs and maximize their profits. This was helped by the gradual liberalization of trade and capital flows, as well as domestic regulation related to the operation of foreign enterprises (Baldwin R. E., 2011).

This process has had important consequences for the international distribution of power between state and sub-state actors. As Drezner, Krebs, & Schweller (2020) point out, “power in global politics is no longer what it once was. The ability of states to exercise power, the way they exercise power, the purposes to which they put power, and who holds power—all have fundamentally changed.” Economic and military power no longer yield influence as reliably as before; while non-state actors such as MNEs increasingly compete with states by possessing and exerting various kinds of power in the international arena.

Similarly, Zeng & Li (2021, p. 29) has shown through case studies that even in the case of Chinese MNEs, ownership is no longer a major determinant of the firms’ preferences and behavior, and the power differential between the state and firm is more complex than political science usually assumes in that Chinese MNEs are able to influence the government’s foreign policy. This means that home-country leverage over MNEs is not as obvious as it might appear.

The argument posited here is not that state policies are no longer effective in shaping the economic realities. However, as evidenced by the failures of bilateral coercive measures noted above, achieving the desired outcomes is more complicated and requires different methods in a liberalized world economy.

Another fundamental aspect of the changing nature of power as formulated by is the fact that power rests on knowledge which is increasingly held within privatized transnational networks. According to Drezner, Krebs, & Schweller (2020), “great powers (...) understand that states move up the ladder of international power and prestige by building knowledge-based economies and by promoting technological innovation and

connectedness within global networks.” In other words, the sources of state power are deeply linked to the global structure and maximizing international power and prestige—a fundamental aim of any state actor—requires policies which are able to harness the forces of global markets and knowledge production networks.

In such a setting, exercising coercion in GVCs results in domestic trade-offs which in turn might affect the international distribution of power. If we consider the previous example regarding the different competitive advantages of US and Chinese firms from the US side, we might surmise that as China’s preponderance is more pronounced in lower value-added sectors, while the US is more advanced in higher value-added sectors. In this setting, the decoupling of the two economies as proposed by some American foreign policy circles should mean higher relative costs for the Chinese economy, as it would be easier for the US to replace Chinese inputs with domestic ones. While this might be true in the short term, focusing on lower value-added manufacturing processes would hurt US economic efficiency and would reduce the aggregate welfare produced by the US economy.

On the other hand, Chinese producers might accrue losses in the short term, but on the medium to long term would face substantially increased pressure to innovate and specialize in higher value-added areas of production. Hence, while on the surface it might appear advantageous for the US to utilize ‘chokepoint effects’ to hamstring Chinese semiconductor fabrication, reducing US reliance on Chinese inputs in chipmaking would in the medium term make China stronger and the US weaker economically (Wang D. , 2021). Similarly, while US export restrictions on Huawei have weakened the firm itself, these measures nevertheless strengthened the role of state-owned enterprises and defence contractors within the Chinese technological architecture, and as such, led to negative outcomes from the perspective of US interests (Lee-Makiyama, 2021).

Emerging economies face similarly complicated trade-offs: even though overreliance on the Chinese economy might result in higher vulnerabilities and risks of economic coercion, domestic demand from voters and businesses might force emerging market governments to nevertheless refrain from disengagement with China, as pointed out by Lee Hsieng Loong (2020), among others. Another international trade-off concerns the fact that the smooth operation of the regional economic architecture requires some level of international coordination to manage common vulnerabilities towards exogenous shocks, for example in the case of a transnational financial crisis or the risks associated

with global warming.¹ Hence while regional states might pursue a strategy of managing vulnerabilities towards China by hedging or balancing, they nevertheless rely on China when it comes to mitigating external and exogenous shocks, as in the case of the financial crises of 1997–1998 or 2008–2009.

Another important consequence is that power and leverage in a production network does not necessarily correspond to gross economic or military might. Taiwan or South Korea are important chokepoints in semiconductor manufacturing, in spite of possessing comparatively meagre military capabilities and market power. Hence network power and chokepoint effects do not correlate with usual notions of power in international politics, which means that the set of actors relevant for the study of power relations in GVCs is broader than the usual suspects of IR.

1.3.3 Contestation in institutions

These dilemmas are especially salient in the case of East Asia. As discussed above, East Asian states have followed export-reliant, outward-facing development strategies, and had done so largely on a unilateral, then bilateral and plurilateral basis, without the establishment of a region-wide institutional framework. This represents an important difference from other regions with well-developed production sharing: in the case of Europe and North America, the architecture of economic interdependence emerged as a result of political bargains; while in East Asia the scale and scope of political bargains from the 1990s onwards were both motivated and constrained by the existing economic architecture which had emerged through the agency of profit-seeking MNEs taking advantage of location advantages shaped by unilateral (domestic) policies. In plainer terms, this means that while in other regions chokepoint effects and other forms of coercion are mitigated by institutional arrangements, the scope of such mitigating forces is considerably smaller in East Asia.

In fact, most of the recent IR and IPE literature tends to discuss East Asian economic interdependence either in the context of the politics of regional economic institutionalization, or more directly as an element of great power rivalry between China and the United States. China is often described as a revisionist actor (Buzan, 2010; Zhao,

¹ A recent example of such risks manifested in Taiwan, where an unusually severe drought led to water shortages, and consequently affected semiconductor fabrication. In turn. The Taiwanese slowdown in manufacturing reverberated through the supply chains and caused delays and losses elsewhere, predominantly in the auto industry (Nakamura, 2021).

2018; Deng, 2014) which is engaged in creating alternative institutions such as the Asian Infrastructure Investment Bank (AIIB) and the Belt and Road Initiative (BRI) aimed at weakening the influence of the US and its allies in the provision and regulation of international finance and commerce, or at least modifying the predominant norms of the international order to better suit China's interests (Stephens & Skidmore, 2019). The AIIB and the Belt and Road Initiative are often theorized from this perspective as serving geopolitical aims and being part of a broader strategy to enhance Chinese influence across the region and the globe (Ren, 2016). Conversely, in light of the above-mentioned protectionist measures introduced by the US, it has also been posited that China's rise has indeed turned the US into a revisionist power which is challenging the very rules and norms of the international system it has established after World War II (Chan, 2021).

In this setting, regional actor such as Japan and the ASEAN utilize strategies to hedge against the negative economic externalities of great power competition. An example cited often is the evolution of the membership, the rules and the aims of the regional institutional frameworks centered around the ASEAN, which according to IR and IPE scholars, can be most aptly explained through elements of rivalry, hedging and balancing among regional actors (He K. , 2018). Similarly, the exclusion–inclusion dynamics of so-called mega-FTAs, such as the Trans-Pacific Partnership (TPP) and the RCEP are often discussed from the perspective of balancing against China.

What follows from these accounts of regional politics is that interdependence, and more specifically regional order formation through the institutionalization of interdependent economic ties, are becoming increasingly beholden to power politics and are being manipulated by regional and global powers so as to further their geopolitical interests (Lee S. , 2016; He K. , 2018).

This reading of the contemporary politics of regional economic engagement holds that the very institutions which are supposed to manage interdependence and mitigate the distributional and commitment dilemmas associated with trade and investment liberalization have instead become vehicles of geopolitical or geoeconomic competition. Hence, the rules, norms, and institutions regulating international commerce and finance are being reevaluated in light of the changing power relations in the region, which alters the landscape in which GVCs, and GVC-led development policies can operate.

1.3.4 Measuring interdependence in the GVC era

A final, scientific problem of analysing the international politics of production network-based interdependence is that the measurement of interdependence in such a setting is highly complicated in itself. Most of the economic data available to researchers is of quantitative nature, whereas qualitative measures of dependence, such as control over technology in a production network, are hard to come by, especially on the macro level. Moreover, many of the traditional measures of interdependence do not hold much explanatory power in the contemporary setting due to accounting and methodological issues. The prime example is the case of trade values: while these are often used as variables describing the strength of interdependence, in a world of production networks, where exported goods contain a large share of imported inputs, gross trade values do not reflect information about the value-added content of exports (and imports), which can vary greatly. As such, basic customs data vastly overstate the value of economic exchange among economies (Shepherd B. , 2020, p. 2).

Similarly, bilateral investment flows among countries do not necessarily represent interdependence among the two accounting economies. First, as MNEs structure their operations globally, it is rare for the core companies to conduct FDI transactions directly, investments are usually made instead by regional or local subsidiaries. Second, with the globalization of finance and widespread capital liberalization, many MNEs do not possess a clearly defined ‘nationality,’ for their ownership and management structure is increasingly transnational.²

The operationalization of such forms of interdependence is problematic as well, as there is an abundance of independent variables influencing the complex structure of production networks. Numerous studies have shown that international economic activity is concentrated within a handful of very large firms that produce in multiple countries and multiple industries (Antràs & Yeaple, 2014, pp. 55-56), and as a result, transnational economic networks develop based on firm-level decision related to production costs and location advantages (Farrell & Newman, 2019, p. 54).

Production costs and location advantages are in turn influenced by endogenous factors such as technological change; as well as domestic economic policies, bilateral and

² For example, in the case of Daimler, the quintessential German auto manufacturer and the owner of the Mercedes-Benz brand, only a third of the shares are held by German entities, while 15 per cent belongs to Asian, 14 per cent to American, 7 per cent to Middle Eastern, and 23 per cent to European investors. Such ownership structures are widespread in contemporary MNEs, making it futile to attribute a national identity to such firms.

plurilateral regional and transregional economic agreements, and global institutions. The development of these institutions is in turn affected by the domestic and international political economy. While previous studies in IR and IPE have investigated the role of non-state actors, transnational enterprises, and international institutions on international economic exchange (Ikenberry, 2009), the abundance of variables and theoretical perspectives represents a challenge in operationalizing the study of regional production networks.

While production networks are asymmetric and hierarchical, determining and measuring these asymmetries on a macroeconomic or international scale is very challenging. Although quantifying these vulnerabilities is essential for understanding the politics of contemporary economic interdependence, the methodology to do so is far from straightforward. Consequently, the IR and IPE literature on the empirics of contemporary interdependence has so far only produced case studies of limited scope, such as the emerging literature on weaponized interdependence (Drezner, Farrell, & Newman, 2021).

1.4 Research questions

This dissertation aims to contribute to the untangling of some of the conceptual and methodological problems outlined above by investigating the interplay between the economic structure and the international political economy in the case of East Asian regional production networks and East Asian GVC participation.

While there is a growing literature on the political attempts to manipulate and alter the structure of regional interdependence, the IR and IPE scholarship is considerably narrower on how the nature and structure of contemporary production-network interdependence affects regional and transregional politics. Instead of looking at the securitization and politicization of transnational economic ties, I investigate how the economic structure affects the political realm.

More precisely, the focus will be on identifying and qualifying the constraints which economic conditions force onto state actors in pursuing their (conflicting) political interests under the conditions of regionalized (and globalized) fragmentation of production.

1.4.1 Research questions

Thus, the overarching research agenda investigated in the following pages is the following:

How does the economic architecture in East Asia constrain and augment state power under the conditions of production network interdependence?

As such a broad question is naturally impossible to cover in depth even at the length of a doctoral dissertation, I structured my research under three narrower sub-research questions, which aim to investigate critical aspects of the question posed above. These sub-research questions are the following:

1. *On which level of analysis are the main determinants of international trade, and production network participation located in East Asia?*
2. *Through which channels does the economic influence of nation states manifest in production networks in East Asia?*
3. *How did 'strategic competition' affect the sustainability of the regional economic order, and did it lead to the creation of a more self-contained economic order in East Asia?*

1.4.2 The relevance of the study

The first sub-research question aims to investigate a foundational problem about the IPE of contemporary interdependence and GVC formation by looking at the main factors determining transnational economic activity in East Asia. This question is closely related to the scholarly debates in the fields of economics, IPE, and IR on the relative importance of domestic and international political variables as well as exogenous factors in shaping interdependence in the region and beyond; or in other words, the debate on the issue of whether contemporary East Asian regional investment and trade flows are influenced more heavily by 'market forces'; recently emerged regional institutions, most notably bilateral, plurilateral and regional Free Trade Agreements (FTA); or are unilateral, self-interested domestic policies of nation states the most important variables in explaining transnational commerce.

Investigating the relative influence of state actors, transnational actors, and international institutions on regional commerce is an essential prerequisite for understanding regional interdependence. The contemporary discourse on competitive regionalism (Urata, 2019) and institutional balancing (He K. , 2018) presupposes that regional institutions are capable of significantly altering the economic architecture and/or the ideational ordering principles of the region, and thus would affect the balance of power. Yet the recent economics research on FTAs found heterogeneous effects, and some

newer studies have shown that some East Asian FTAs did not lead to a substantial increase in trade among parties (Ando, Urata, & Yamanouchi, 2019; Yamanouchi, 2019).

On the other hand, the theory of weaponized interdependence assumes that important sources of economic power in international networks are located on the domestic level; and students of international economics and GVCs have also found domestic regulations and institutional features to be important determinants of the international structure of production (Antràs, 2020; Nunn & Trefler, 2014). Hence, the networked nature of interdependence and the securitization of asymmetric economic ties makes it particularly important to investigate whether state actors can exert more influence on the regional economic outcomes through unilaterally imposed domestic policies or regional institutional formation.

The second question engages with two broader research areas. One is the economics research on the structure of international production networks, which investigates the transnational linkages which make up GVCs and regional production networks. The second one is the emerging theme in IR and IPE about the weaponization of interdependence and emerging issues of economic security, including supply chain security.

Understanding the politics of production network-based interdependence and the asymmetries and hierarchies involved therein requires a more precise understanding of the transnational linkages making up these networks, for any sort of reasonable inference about ‘weaponized interdependence’, institutional hedging or balancing, or the economic aspects of US–China ‘strategic competition’ requires a clear empirical picture on the forms and sources of power and leverage in international production. For this reason, I utilize the insights and methodological advances of economics to empirically evaluate different avenues through which certain qualitative aspects of interdependence, political power, and leverage in production networks can be measured on the state and inter-state level. The novelty in my approach comes from the fact that most of the IR literature on interdependence and regional order has so far neglected to utilize more sophisticated tools to measure these phenomena more precisely.

The third sub-question aims to analyze what sort of effects the previously examined economic conditions have on international politics in East Asia and the Asia–Pacific. The inquiry will focus on three specific areas: the empirical links between political discord and the previously examined variables of production interdependence; the level of self-containedness of the East Asian economic system and the scope and scale

of its extra-regional dependencies; and the linkages between regional institutionalization and the changing economic structure of the region.

In essence, this part of the inquiry investigates the interaction between the economic realities of the region and the international politics of China's rise. The empirical part will deal with whether regional states are reducing their dependence on China; and whether the development of the regional institutional infrastructure reflects changes conducive to China's political interests, or is more reflective of balancing/hedging by other regional states. This sub-research question aims to put into political perspective the previously discussed economic processes by utilizing the results of the first two sub-research questions to answer the overarching research question, namely: how the economic structure affects regional politics.

1.4.3 Hypotheses

The testable hypotheses regarding the sub-research questions are as follows.

In the case of the first research question, I propose that the main determinants of regional trade and production network participation are not located on the level of regional politics. While regional political developments are important variables affecting the international division of labor, I assume that in the era of strategic competition, domestic policies of great powers, as well as structural forces stemming from exogenous factors, such as technological attainment and progress, supersede the importance of presently available regional levers over the production architecture.

For the second question, I propose that under the condition of production network interdependence, political leverage stems from the capability to alter the production structure and/or achieve a predominant position within the production hierarchy. Such capabilities predominantly stem from technological attainment, in which area China lags far behind the United States, which limits its capabilities to influence these networks.

For the third question, I posit that strategic competition has weakened the sustainability of the regional economic order, and the expansion of East Asian intra-regional economic ties could not counter the turbulence in the global economy caused by the United States. I also posit that the decoupling theory is a fallacy, for the East Asian economic architecture is not a self-contained system but is heavily dependent on extra-regional markets and inputs presently and current regional institutions are not adequate to solve the distributional dilemmas inherent in economic integration. Moreover,

historical evidence suggests that the transition from an economic system based on manufacturing production to one reliant on intra-regional consumption and services is problematic for East Asian states.

1.5 Literature review

This dissertation is aimed to contribute to the discipline of International Political Economy, in as much as it investigates the interplay between political and economic forces in the international and transnational sphere, or in other words, the interaction between the interstate system and international exchange relations (Gill, 1990, p. 369).

Nevertheless, the research agenda described above is positioned at the intersection of a number of disciplines beyond IPE. One important consequence of the political contestation of regional production for the study of International Relations is that the intellectual distance between political science and economics will need to be reduced to fully grasp the various forces at hand. Hence, this study will include insights from the research fields in international economics and IR dealing with GVCs, economic interdependence, geoeconomics, and regionalism. As a result, insights from a number of fields will be used heavily in the following pages, and the methodology described henceforth will utilize the methods of trade economics and econometrics.

In fact, one of the main goals of this dissertation is to invoke the insights of the economics literature more deeply into the discussion of regional politics, for in my perception, contemporary students of East Asian IR exhibit a tendency to underrate the importance of economic conditions, and generally appear to place little value in engaging with the complexities of regional economics. The following sections provide a brief overview of the heterodox literature which forms the basis for exploring the research questions and sets out some of the main tenets of the analytical framework.

1.5.1 Economic Interdependence in International Relations

Interdependence research has a long history stretching back as far as Normal Angell's Great Illusion in 1909, which laid out the argument that war between the British empire and the emerging Germany will be avoided due to mutually beneficial economic interdependence between them.

The theoretical foundations of the theory, however, were laid down during the Cold War period within the confines of the paradigm which later came to be known as

neoliberalism. In the first systematic explorations of the topic, Hirschman (1945) posited that the nature of interdependence is captured by the opportunity costs one state can impose on another by severing economic ties. In this setting, one state's potential to interrupt trade with its partner, and thus exert economic costs on it, yields bargaining power in the political arena. Consequently, in an asymmetrical relationship the dependent state can be subjected to the manipulation or coercion of the more powerful one if the latter threatens to sever economic ties.

This basic premise has been repeated by Keohane & Nye (1977), who stated that the less dependent state in an asymmetrical relationship may exercise its relative economic power to gain concessions or bring about economic or political change. Keohane & Nye (1977) distinguished between sensitivity (the strength of the effects on one state of occurrences in another) and vulnerability (the relative availability and cost of the alternatives). Sensitivity, or the strength of the effects on one state of occurrences in another, stems from the fact the patterns of consumption, production and innovation in different nations, sub-regions and sub-national regions of the world and of global regions can affect whole industries in other regions and sub-regions. Vulnerability in contrast related to the relative availability and cost of the alternatives in case a certain interdependent relationship experiences disruption.

Subsequent neoliberal research on the effects and importance of economic interdependence focused on the commitment and collective action dilemmas involved in shaping economic outcomes in a globalizing world economy, where transnational linkages and cross-border transactions increase. Interstate cooperation in general, and international economic integration in particular, involves a commitment or collective action dilemma, inasmuch as the actors involved are unable to reach a solution which is Pareto-optimal for each of them. Such a situation, the collaboration game, is akin to the prisoner's dilemma, where there are strong incentives for some participants to defect (Keohane, 1984, pp. 67–9). Another type of collective action problem is the coordination game, which involves multiple equilibria, some of which are optimal to a number of participants, but sub-optimal for others. Moreover, distributional dilemmas occur if a state or a group of states continue to experience repeated sub-optimal outcomes during repetitive coordination games (Mattli, 1999, p. 55). The general position in neoliberal IR is that there are two possible solutions to these dilemmas: international institutions or regimes, and leadership (Haggard, 1997, p. 22).

Neoliberal scholars focused on the former, positing that institutions reduce uncertainty, transaction costs and asymmetries of information and as such can absorb the distributional and collective action dilemmas (Keohane 1984). Hence, globalization creates demand for the formation of international regimes, which are defined as “principles, norms, rules, and decision-making processes, around which actor expectations converge in a given issue-area” (Krasner, 1982, p. 185).

A distinct set of theories dealt with the effects of international integration, which are defined as reducing the barriers to the movement of the factors of production among nation states. The orthodox functionalist theory held that material interdependence between states develops its own internal dynamic as states integrate in limited functional, technical, and/or economic areas (Mitrany, 1933). The neofunctionalist expansion of this idea holds that cooperation leads to positive spill-over effects: integration in even a single sector or issue-area will lead to an increased number of interstate transactions in other sectors, thus creating demand for integration in those sectors as well. Neofunctionalists argue that this process requires the foundation of supranational institutions to govern increased interstate interactions (Haas, 1958). Another theory, liberal intergovernmentalism assumes that states achieve their goals through intergovernmental bargaining. This theory holds that cooperation or institution-building is the collective outcome of interdependent rational state choices and negotiations (Moravcsik & Schimmelfennig, 2009, p. 68).

In contrast, the neorealist position holds that international regimes and institutions are reflections of the distribution of power within an international system and are created by a powerful state or a group of powerful states to further their own material national interests. According to this strand of thought, in an anarchic world where states are preoccupied with maximising their power to guarantee their survival, institutions are not built on the spirit of cooperation, but on the logic of power (Grieco, 1988). States only participate in these frameworks to avoid relative losses that result from shifts in the global distribution of power. Hence, while liberalism focuses on institutions as the dominant solutions to the aforementioned game theoretic puzzle, realists instead hold that the principles of power politics dictate that the puzzle can only be solved through power-based leadership.

Much of the literature on independence has focused on the relationship between trade interdependence and the incidence of interstate conflict in large-n studies. Neoliberal scholars argued for the existence of a ‘liberal peace,’ that is, political stability

due to interdependent commercial ties (Goldsmith, 2007). Others have investigated the role of broader economic variables of dependence and concluded that interdependence offers nonmilitarized avenues for signaling among nations (Gartzke, Li, & Boehmer, 2001). Still others posited that trade *per se* might not provide peace, but free trade does (McDonald, 2004).

Realist scholars, however, argued based on differently specified empirical studies that trade increases the incidence of conflict, for leaders perceive trade dependence as a vulnerability from which they aim to break free (Barbieri K. , 2002). A neorealist argument posits that any notion of trade-based stability is merely illusory, and the current and potential political divisions in the region are bound to challenge economic interdependence (Mearsheimer, 2010). However, another strand of neorealism, referred to as defensive neorealism accepts that cooperation can be maintained even under anarchy. This strand of thought conceives international relations as akin to a repeated game in game theory, where cooperative practices can develop and hold over time (Fearon, 2018). Another recent theoretical innovation was provided by the trade expectations theory, which—in contrast with the standard liberal viewpoint—posits that whether interdependence heightens or lowers the risk of conflict depends on the political perception about the future trading and investment environment: if future trade is expected to decline, then the costs of conflict are lower (Copeland, 2014).

In spite of the aforementioned differences in approach, the theory of hegemony attracted both neoliberal and neorealist attention, and in fact, somewhat later invited constructivist research as well. Hegemony in the international system is generally defined as the economic preponderance of a state (Keohane, 1984, p. 32) which creates social structures to advance its interests (Gilpin, 1981, p. 9). In this sense, hegemony combines the two solutions mentioned earlier: it is institution building by leadership. But unlike the basic realist notion cited above, theorists of Hegemonic Stability Theory emphasise that other states in the system benefit from this kind of leadership. For Kindleberger (1973), the hegemon is a leader which maintains an open market for other countries' surpluses, a steady outflow of capital for productive investment, and acts as an international lender of last resort. For Krasner (1982), and Keohane (1984), the power of the hegemon lies in its ability to create regimes, and as such, dictate the norms and rules guiding political and economic relations among nations. Strange (1987, p. 565) has defined this capability more broadly as structural power, derived from the control of the security structure, the production structure, the financial structure, and the knowledge structure. More recent

works on hegemony put emphasis on the issue of legitimacy, and the capability of the hegemon to attract a followership (Clark, 2009). While it should be acknowledged that the main tenet of Hegemonic Stability Theory—that the international system *needs* a hegemon to sustain stability and cooperation—is inadequately tested and empirically challenged (Clark, 2009), hegemony has been an integral feature of East Asian international relations for the better part of history. East Asia had historically been a hegemonic system dominated by China, and in the post-war period US hegemony had important constitutive effects on the architecture of the region.

Subsequent research on the interplay between power in international politics and economic factors included the study of economic statecraft, which posited that in a world where militarized conflicts among great powers are increasingly less likely due to the availability of nuclear weapons, economic coercion was an integral element of foreign policy (Baldwin D. A., 1985). Other authors have coined the term ‘geoeconomics’ to describe the apparent increase in the toolkit of economic coercion and argue that the international economic system is beholden to great power politics exercised through economic means (Wigell, Scholvin, & Aaltola, 2018).

A substantial number of studies dealt with the effects and viability of economic sanctions as tools of foreign policy, especially as the use of sanctions have indeed become more widespread in the post-Cold War era (Drezner, 1999). Nevertheless, previous scholarship questioned the efficacy of economic sanctions in securing the desired foreign policy outcomes and concluded that the effects of sanctions vary greatly based on their design, and the circumstances. In short, “sanctions are more likely to work when the demands are clear, when there is multilateral cooperation supporting the sanctions, when no ‘black knights’ are willing to step in and economically support the target, and when expectations of future conflict between the target and the sender are muted” (Drezner, 2021, p. 11).

Established realist and liberal positions have been challenged since the 1990s by the paradigm of social constructivism which examines immaterial factors as the explanatory variables of International Relations, instead of the traditional material variables explored by liberalism and realism, such as power and economic welfare. Constructivists focus on norms and social structures instead of material forces. They hold the view that shared ideas create patterns of behaviour that might be cooperative or conflictual and contend that changes in the norms of international society can create changes in the identities and relationships of states to each other (Wendt, 1999). The

constructivist ‘orthodoxy’ states that ideas, norms and values, not material interests, shape regional politics in East Asia, but these norms—such as the centrality of non-interference and the resistance to binding commitments—can also constrain its institutional development (Acharya, 2009).

A second strand of competing explanations came from the political economy approach, which holds that most of the determinants of international institution-building can be found on the domestic level of inquiry: international bargaining for norm- and rule-creation is influenced by bargaining between political and economic factions on the national level (Mattli, 1999). The orthodox set-up of this approach with regards to regional economic integration assumes that exporting industries will lobby for liberalization, while import-competing industries will use their domestic influence to hinder the opening of the economy (Manger, 2014). There are usually two main variables influencing the outcome: one is the domestic ‘balance of power’ between exporting and import-competing industries, the other is the political calculations of the political class. According to one formulation of this theory, decision-makers will decide on liberalization (and thus international integration) predominantly when they can gain political capital from the increased economic welfare resulting from it (Mattli, 1999).

A somewhat similar development in contemporary IR, labelled by Farrell and Newman (2014, p. 331) as the ‘New Interdependence Approach’ or ‘New Structuralism,’ deals with “the relationship between the domestic and international politics in a world of economic interdependence.” This strand of research is based on the observation that in a globalized world economy with significant amounts of international investment and trade, domestic regulation and economic policies can have economic, political, and social consequences beyond the geographic jurisdiction of the state actor implementing them. These consequences can range from dyadic to systemic, and can be both intended and unintended, depending on the international centrality of the actor implementing the policies in question.

Some of this literature is focused on the financial sector, where the preponderance of the United States and the central role of the US dollar as the currency of international settlements and national reserves means that other states face the costs—and benefits—of US regulatory measures which have a solely domestic focus (Iacovello & Navarro, 2019). Another well-explored phenomenon is the international reach of the European Union’s regulatory authority: given the size of the EU’s internal market, and the economies of scale involved in contemporary mass production, EU regulations go well

beyond the bloc's border, and constitute *de facto* global rules on consumer safety and competition (Bradford, 2020).

A strand of this research agenda more in line with the traditional sensitivities of IR has been termed 'weaponized interdependence,' which is "defined as a condition under which an actor can exploit its position in an embedded network to gain a bargaining advantage over others in a contained system" (Drezner, 2021, p. 1). In other words, weaponized interdependence is a distinctive form of economic statecraft, which involves intervention by state actors in private markets to achieve public policy objectives, but in contrast to sanctions, it is a precision instrument which aims to exploit bottlenecks or choke points in existing networks (Mastanduno, 2021, pp. 67–68).

As described by Farrell and Newman (2019, p. 49), weaponized interdependence is based on the conceptualization that economic "networks are structures in the sociological sense of the term, which is to say that they shape what actors can or cannot do," and "network structures can have important consequences for the distribution of power." In this realist-leaning understanding, international economic networks "do not produce a flat or fragmented world of diffuse power relations and ready cooperation, nor do they tend to become less asymmetric over time. Instead, they result in a specific, tangible, and enduring configuration of power imbalance. Key global economic networks—like many other complex phenomena—tend to generate ever more asymmetric topologies in which exchange becomes centralized, flowing through a few specific intermediaries. Contrary to Keohane and Nye's predictions, key global economic networks have converged toward "hub and spoke" systems, with important consequences for power relations."

While the weaponized interdependence theory accepts that these economic networks have emerged typically through "incentives of businesses to create monopolies or semi-monopolies, increasing returns to scale in certain markets, rich-get-richer mechanisms of network attachment, and the efficiencies available to more centralized communications networks." Nevertheless, these business networks in turn "inadvertently provide states, which are concerned with political as well as economic considerations, with the necessary levers to extend their influence across borders. Thus, structures that were generated by market actors in pursuit of efficiency and market power can be put to quite different purposes by states" (Farrell & Newman, 2019, pp. 49–54). Weaponizing interdependence on the one hand challenges the limitations of traditional economic sanctions: multilateral cooperation is not necessary, 'black knights' are of less concern,

and as the costs on the sender are lower, the threshold for coercion is reduced. On the other hand, similarly to sanctions, weaponizing interdependence also has a mixed track record in securing desired outcomes due to poor implementation and the structural limitations of its application (Drezner, 2021, pp. 9–11).

1.5.2 The regional politics of economic relations in East Asia

The relationship between interdependence, institutions and vulnerability plays a central role in the contemporary literature specific to East Asia. As noted above, the common narrative in the IR and IPE literature is that the East Asian regional economic architecture emerged due to market forces. However, since the 1990s, the number, scope, and breadth of regional institutions to manage interdependence among regional states, and with and within the ASEAN, has expanded rapidly (Urata, Trends of FTAs in East Asia from the 1990s to the 2010s: defensive and competitive regionalism, 2019). More recently, an increasing number of plurilateral ‘mega-FTAs’ have been negotiated to unify the plethora of bilateral FTAs (Watanabe, 2016), and albeit with limited membership compared to the original design, but the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP) have already entered into force by the submission of this dissertation.

Recent research on East Asian regional order tends to focus on these institutional arrangements. Just as general IR theory, the approaches to regional affairs are deeply heterogeneous. In short, the following perspectives will be briefly introduced here: (1) offensive neorealism (2) institutional balancing theory (3) network governance theory; (4) liberal institutionalist optimist (5) institutionalist pessimist (6) political domino theory; (7) economic domino theory; (8) institutional Darwinism; (9) constructivism; (10) domestic political economy.

Offensive neorealist observers of East Asia tend to focus on strategic and structural factors hindering cooperation, as well as those which carry the potential for conflict. The few realist observers of East Asian regional institutionalization dismiss the process as an illusion, arguing that it had remarkably little impact on unresolved interstate disputes; East Asian states pursue self-interested bilateralism; and purported regional norms have little effect (Jones & Smith, 2006). Even those more forgiving towards East Asia’s form of regionalism contend that “overlapping institutions are helpful in muting security dilemmas, but they fail to regulate great power relations through institutionalized

understandings about rules of conduct and conflict management” (Goh, 2018, p. 45). Instead, most offensive realist writers tend to focus on the conflicting interests of East Asian states and the potential for conflict and security competition in the region (Mearsheimer, 2010).

The second theory does not outright dismiss the relevance of East Asian regionalism, but questions the economic motivations and the economic utility of it. According to this strand of research, East Asian states treat institutions as vehicles of power politics and are engaged in various forms of intra- and inter-institutional balancing to advance their strategic aims through and by regional institutions. Institutional balancing holds that states pursue institutionalization predominantly to pursue (geo)strategic aim *vis-à-vis* their competitors (He K. , 2018). Most of the work within this paradigm focuses on the rivalry between Japan and China in pursuing the adoption of their own ‘vision for the regional architecture,’ and states that these two countries are vying for influence over ASEAN, within RCEP, and by the creation of rival international institutions, such as the AIIB and the BRI, while the ASEAN itself is trying to project its own vision by emphasising the principle of ASEAN Centrality in East Asian integration (Lee S. , 2016).

Network governance was a dominant narrative in the 1990s and early 2000s, with a mostly liberal-leaning focus that relied on the inclusion of constructivist perspectives. This paradigm explains the success of East Asian regionalisation through the concept of informal networks: networks of sub-state actors which are involved in transnational activities serve as the principal agents of regionalisation. Such networks include functional ones, such as regional production networks managed by MNEs; ethnic networks, such as the Chinese communities living in various East Asian countries and keeping up transnational business and cultural ties both with China and with Chinese communities in other countries; or professional networks, which constitute arenas of inter-state interaction, coordination and socialization. According to this paradigm, these informal networks serve as substitute for institutionalization on the political level (Katzenstein & Shiraishi, 1997; 2006).

Neoliberal institutionalist observers posit that increased interdependence would require more international cooperation and coordination. This idea has become more forceful after the Asian Financial Crisis of 1998, which has shown the limits and the vulnerabilities of the economic and regionalism strategies pursued by East Asian states. This narrative asserted that network governance can no longer maintain equilibrium in

the 21st century, and formal regionalism and institutional bargaining is necessary for the provision of public goods and club goods, which are warranted by the increased, but under-managed interconnectedness and the shared vulnerabilities in East Asia (Aggarwal & Koo, 2008). A common argument in this literature put emphasis on the process of ‘lattice regionalism’: according to this expectation, institution-building would commence on the bilateral level, then would become plurilateral, and finally would emerge to the regional level (Dent, 2008).

Liberal pessimists posit that despite a host of shared functional interests, East Asia lacked formal, region-wide international institutions almost completely until recently, which means that higher levels of interdependence in East Asia do not necessarily translate into higher institutionalization, for East Asian countries have a diverse set of economic preferences and possess the bargaining power to reject external efforts towards institutionalisation (Haggard, 1997).

The ‘economic’ domino theory states that East Asian institutionalization, especially the rapid rise in the number of regional trade agreements, is the result of the ASEAN–China trade negotiations and the regional reaction to it. Other states within and around the ASEAN (Japan, South Korea, Australia, New Zealand, and India) started to scramble to conduct trade agreements, as they feared that preferential liberalization among ASEAN and China would weaken their regional position and harm their economies. In this sense, the proliferation of FTAs was motivated by the fear of being discriminated against in term of tariff levels (Baldwin R. E., 2008).

The political domino theory suggests that FTA-proliferation is not a result of economic interests, since the level of interdependence have not increased significantly in East Asia, and that the newly created FTAs have very limited economic impact upon closer inspection. This theory argues that instead it was political competition among China and Japan that led to the explosion of FTA-activity in the region: instead of forging new economic ties, the two states strived to out-compete each other in building political ones through institutions (Ravenhill, 2010). What separates this theory from the previously discussed institutional balancing approach is that it does not pay attention to the role of norms or regional vision, and characterizes the China–Japan rivalry as a pointless exercise; whereas the institutional balancing theory holds that competitive institutionalization is in fact meaningful from a political, security and normative perspective.

Institutional Darwinism holds that institutions in East Asia are reactive in nature, and strive to play not an intra-regional, but rather an extra-regional coordinating role, inasmuch as their aim is to strengthen the collective East Asian defences *vis-à-vis* external financial shocks. This theory also posits that regional institutions continue to “reflect the pre-eminence of individual state strategies rather than any collective predisposition toward multilateralism *per se*”. East Asian regionalism is a complex “ecosystem” of institutions, and the future development of this ecosystem is dependent on the process of institutional Darwinism, where “institutions that prove their worth will survive and thrive while those that do not will languish” (Pempel, 2010, pp. 209–213).

In contrast to the aforementioned approaches which mostly (although not exclusively) evaluate regionalism and institution-building on material grounds, constructivist scholars argue that in contemporary East Asia, it is not the lack of material interests demanding institutions that hampers regionalism, but the ideational factors preventing deeper and legalised forms of engagement.

Acharya (2009) has argued that institutional change in Asian regionalism cannot be explained as a product of material forces or strategic bargaining spurred by growing economic interdependence. Instead, it is shaped by norms: Southeast Asia had developed a ‘cognitive prior’, a distinct regional construction of sovereignty based on the shared norm of non-intervention, which has shaped the development path of ASEAN. Consequently, East Asian regionalism has been evolutionary rather than revolutionary, path-dependent rather than path-breaking, and overall, under-institutionalised. Ba (2009) argued that ASEAN had produced new social norms, a new culture of regional dialogue, and new social and institutional practices. On the one hand, these led to the emergence of a regional belief that states should settle disputes in a non-violent manner and should work towards regional solutions. On the other hand, these common norms also encompass a resistance to institutionalisation, and thus gave rise to a fundamentally different approach to regionalism in East Asia than in Europe. Some constructivist authors are more optimistic about the potential of not just incremental, but more substantive progress in East Asian regionalism through norm-creation. Katsumata (2010) argues for example that the region is slowly but surely creating an ‘East Asian community.’

From a comparative perspective, Breslin (2010, p. 709) argues that at times of crisis, when economic considerations dominate regional relations, “integrative logics and strategies” come to the fore. However, in ‘normal’ times, when there is no apparent threat

to the stability of regional economies, geo-strategic considerations reassert themselves, and cooperation is replaced by competing visions and the over-supply of regional integrational initiatives. Breslin and Higgott (2003, p. 172) highlight that “international/global-level variables (investment flows, prevailing ideological orthodoxies, the development of other regional groupings and developments in the major international financial institutions and the WTO)” affect the incentive structures of member states of regional organisations,” and that the relationship between “domestic politics and the policies of member states within given regional organisations [work] as a two-level game.”

The political economy approach or domestic politics argument produced remarkably differing assertions on East Asian regional integration. A strand of authors argue that domestic economic interest groups in East Asia tend to resist liberalization, and regional institutionalization is hampered by domestic conflicts between stakeholders, in which the anti-liberalization import-competing sectors usually win (Jones L. , 2016).

In contrast, ‘juggernaut theory’ argues that liberalisation strengthens pro-trade political economy forces and weakens those of anti-trade forces: due to liberalization, foreign firms will enter the market and thus the economic and political influence of import-competing, and thus anti-trade lobbies will decline. This feedback mechanism then triggers further waves of liberalisation, as the power balance between the pro-trade and the anti-trade forces gradually tilts towards the former. “Once the tariff-cutting ball starts rolling, political economy momentum keeps it rolling until all tariffs in its path are crushed” (Baldwin R. E., 2011, p. 29).

Another argument proposes that there is domestic demand for regional institutionalization in East Asia from exporting MNEs. Although the scope of liberalization is limited in the region due to the strength of import-competing industry lobbies, in sectors where vertically differentiated intra-industry trade dominates, institutionalization is manageable and successful (Manger, 2014).

1.5.3 The economics of trade and production networks

As noted earlier, one of the main aims of this dissertation is to help to bridge the gap between IR on the one hand, and economics research on East Asian production networks in particular, and economics research on GVCs in general, on the other, since it is unrealistic to attempt to explain the politics of production network interdependence

without understanding the underlying economic realities. Or in other words, the birth, evolution and contemporary make-up of the networks which the weaponized interdependence research program is aiming to analyze is fundamental to the political manipulation these networks can be (mis)used to.

1.5.3.1 The economics of GVCs

While traditional theories of trade have focused on country-level differences in explaining trade flows, such as comparative advantages and differences in factor endowments, in the words of Antrás & Yeaple (2014, pp. 55–56), over the last two decades, international trade theory has undergone a steady transformation that has placed firms rather than countries or industries as the central unit of analysis. This transformation has been fueled by micro-level empirical studies that have shown international activity to be concentrated within a handful of very large firms that produce in multiple countries and multiple industries. Consequently, much of the contemporary trade economics literature focuses on issues such as firm heterogeneity, market structure, and so on (Melitz & Redding, 2014). While it is beyond the focus of this dissertation to engage in depth with the microeconomic theories of production sharing and GVC formation, certain broader insights and problems are relevant to this study.

A GVC is defined by economics as consisting “of a series of stages involved in producing a product or service that is sold to consumers, with each stage adding value, and with at least two stages being produced in different countries. A country participates in a GVC if it produces at least one stage in a GVC” (Antrás, 2020, p. 3). Value chains are different from supply chains, and production networks, as they go beyond the latter’s emphasis on manufacturing- and distribution-related activities to also include activities such as design and branding that create value for a product, though not necessarily transforming it physically (Zeng & Li, 2021, p. 31).

GVC development led to “hyper-specialization” among national economies to fragmented production processes (Antrás, 2020, p. 3), a lot of which are agglomerated in industrial zones focusing on intermediary production. (Kimura, 2006). As a result, “unlike in traditional conceptualizations of international trade, which focus on international transactions that involve only two countries (an exporting country and an importing country), GVCs entail production processes that often cross borders multiple times and that often involve more than two countries.” Under these conditions, “traditional determinants of international trade (such as factor endowments, geography,

institutions, market size) are naturally also relevant for the extent to which countries and industries get embedded in GVCs, though the way in which these traditional determinants affect GVC flows is sometimes distinct from how they affect traditional trade flows” (Antrás, 2020, pp. 3–5).

One such consequence is that the usual links associated by economics research between domestic levels of capital and skilled labor are weaker in this setting. Moreover, the importance of contracting institutions is higher, for a lot of GVC trade involves products where the degree of specificity and customization is high. Another issue is that in a hyper-specialized, fragmented production process, the performance of the whole GVC depends on the strength of its weakest link. This leads to what is described by Antrás (2020, p. 8) as a hold-up problem, where the bargaining power of suppliers rises. For this reason, GVC firms aim to reduce their uncertainties, which can be best obtained through better contract enforcement.³

Moreover, the weakest link mechanism also means that trade costs could have a disproportionately large effect on GVC participation, hence regional trade agreements are expected to have a large influence on GVC development. Moreover, as trade is traditionally highly impacted by market size and demand structure, in a GVC setting, large markets are more likely to utilize their market position to take control of downstream production processes (Antrás, 2020, p. 8), which in turn promise the largest financial returns.

1.5.3.2 The IPE conceptualization of GVCs

Markedly different from the economics and IR perspective, IPE research on GVC governance traditionally focused on three issue areas: the typology of the corporate power of firms *vis-à-vis* other firms in production networks and the role of the most powerful players, or ‘lead firms;’ how the governance of GVCs—the diffusion of power among firms and the form of the network itself—affects the distribution of gains among countries, firms, and workers that are part of the chain; and the factors that influence whether participants can upgrade their position within the GVC from lower to higher value-added tasks (Zeng & Li, 2021, p. 32).

Gereffi (2014, pp. 15–17) argued that in the contemporary international economic environment, “the extreme asymmetries of power in favor of lead firms that characterized the buyer-driven and producer-driven chains are shifting in many cases toward the top

³ The theory of hold-ups is detailed in sections 3.1.3 and 3.1.5.

manufacturers located in emerging economies such as China,” which leads to “geographic concentration associated with the growing prominence of emerging economies as key economic and political actors.” In this framework of analysis, contemporary GVC development has two main implications: a shift of bargaining power toward large domestic producers from dominant economies, and the concentration of GVCs around the same countries.

Another important point in contemporary GVC development is that in some cases, most prominently in China, the state appears in CVCs as producer (state-owned enterprises), and buyer (public procurement) directly, as pointed out by Horner (2017). While GVC thus traditionally expanded through profit-seeking by private enterprises, emerging models of state capitalism give states with such domestic institutional configurations direct tools to influence networks of production. In fact, this is a large part of the political frictions which are generated by China’s rise.

1.6 Analytical framework

1.6.1 Analytical observations

Taking into account the diversity of the literature on the topics covered in this dissertation, it is necessary to simplify the basic tenets to provide focus to the study. First, it is a widely accepted fact that the agents of transnational economic transactions, especially in the case of production networks, are MNEs. Second, these MNEs are predominantly profit-oriented organizations which strive to minimize their costs and maximize their profits. Third, these MNEs respond to incentives provided to this end. These incentives can be a result of exogenous factors, such as technological change; domestic policies, such as tax breaks or tariffs; and international political action, such as the creation of FTAs to lower trade costs.

In this sense, following the framework of weaponized interdependence, MNCs are the intermediary variables, and states will have to aim to influence MNC behavior in order to shape international production networks and the vulnerabilities involved therein. Hence, in the context of this research I understand power as the ability to affect the transnational flows of goods, capital and information so as to create, limit, or exploit vulnerabilities *vis-à-vis* other states in order to achieve one’s geostrategic interests.

Based on recent state practice, I assume that under the conditions of US–China strategic competition, great powers are more interested in relative than absolute gains. It

is widely accepted among economists that protectionist measures undertaken by the consecutive administrations of Donald J. Trump and Joseph Biden in the US, such as levying tariffs on Chinese imports and strengthening the Buy American act, are reducing the aggregate welfare of the United States. Similarly, some studies show that Chinese industrial policies aimed at fostering the development of domestic industry are not cost-effective (Barwick, Kalouptsi, & Zahur, 2019). This means that strategic considerations trump economic rationale on both sides, and as such, competing states tolerate the loss of absolute gains from trade and other forms of economic exchange, and aim to improve the security balance in their favor instead of maximizing short-term welfare gains.

Nevertheless, we might also assume that there is a limit to their cost tolerance, and consequently, to the potential for conflict as well. The theoretical synthesis of various defensive realist and neoliberal institutionalist perspectives provided by Fearon (2018) suggests that in the case of a symmetric military balance, there is ample room for cooperation even under the conditions of a security dilemma.

Moreover, it is reasonable to assume that even great powers cannot tolerate negative absolute gains for fear of domestic political reprisal. As continued economic development is a declared national core interest of China, and the economic situation tends to be a strong predictor of US elections, it is reasonable to assume that the scope for negative absolute gains is limited.

Another argument for stability under strategic competition stems from the nature of the economic architecture. Even though the contemporary literature on East Asia focuses on US–China frictions and regional balancing and hedging strategies, it should be noted that given the sophistication of the regional production networks, and the relatively large number of countries they have penetrated, neither the establishment, nor the continuous operation of these networks would have been possible without state-level backing and state-level supply of the fundamental institutional features which are required for regional trade and economic integration to take hold. Hence, the strain the regional architecture can endure is limited, hence the great power strategies are more focused on building coalitions than destroying institutions.

This is related to the fact that smaller states appear to be mostly interested in absolute gains, since relative gains do not have the potential to produce a meaningful change in their status *vis-à-vis* great powers. In other words, countries such as Indonesia or Thailand have no hope of lessening their power deficit *vis-à-vis* China or the US. Nevertheless, such states are expected to engage in hedging to reduce the asymmetries of

interdependence. Bandwagoning, on the other hand, does not appear to be a reasonable strategy, and is hardly pursued by any state in the region.

1.6.2 Treating interdependence as a multi-level phenomenon

In line with the aforementioned observations and the emerging research on the domestic and exogenous sources of the management and exploitation of economic interdependence, this dissertation aims to follow a perspective which treats the economic structure as the outcome of policies and structural forces on multiple levels of analysis.

Krasner (1982) defined regimes as intervening variables between state-level actor expectations and international outcomes. Applying this logic to regional integration would suggest that the state-level actor expectations concern (predominantly, although not exclusively) economic development through international trade and investment; the intervening variables are regional institutions; and the outcome is regional integration. In plain terms, states create institutions to facilitate regional integration because they assume that regional integration will raise their economic welfare.

International institutions are supposed to provide five regulating functions in the international system: (1) reduction of uncertainty; (2) reduction of transaction costs; (3) reduction of asymmetries of information; (4) absorption of distributional costs involved in integration; (5) solution to collective action dilemmas (Keohane, 1984). In neoliberal theory, these regulating functions are discussed in relation to inter-state relations, nevertheless it is easy to see that they have the exact same utility for state actors as sub-state actors operating on a transnational scale. The reduction of uncertainty in the international system, the reduction of transaction costs (service link costs), etc., make it possible for MNEs to effectively operate in multiple nations. International institutions do not lead to *de facto* integration by themselves; but facilitate integration by supplying the aforementioned regulating functions to transnational actors.

However, in the case of transnational business, there is no reason to assume that such regulating factors can only be provided on the international level, or that international regulation is necessarily a prerequisite to regional integration. As described in New Institutional Economics literature (North, 1981) and contemporary development economics (Acemoglu & Robinson, 2012), domestic institutions serve important regulating functions in shaping the scale, scope, nature, and quality of both domestic and international business. Take, for example the definition of institutions by North (1981), according to which “institutions, understood as the set of rules in a society, are key in the

determination of transaction costs.” In this sense, institutions that facilitate low transaction costs create incentives for increasing the number of transactions.

It follows from this that in an adequately open economic setting, domestic institutional features gain international relevance by influencing the cost structures of market actors. Thus, it would be more useful to think of regional outcomes as driven not only by regional or global institutions, but as supplied by a multitude of institutions on various levels, and of various configurations.

In other words, MNEs do not export because of the existence of a trade agreement, they export because the tariffs are low. Of course, tariff reduction is the main aim of international trade agreements; but that does not mean that tariff reduction cannot happen without a trade agreement. Trade agreements work by changing domestic policy, most prominently by reducing or eliminating the national tariff rates on international trade, and by serving as guarantees that MNEs will enjoy a relatively stable policy environment in the hosting country.

But the changes of domestic policy which facilitate trade does not necessarily have to be a result of international agreements. It is not that East Asian regionalisation has developed solely through the agency of market forces and without the influence of institutions and politics, but that the institutional and political factors shaping the behaviour of market forces did not register on the scope of International Relations.

For these reasons, my approach aims to treat GVC interdependence in IR a multi-layered problem, where outcomes are shaped by actors on all levels of analysis. To reduce such a setting to one that can be captured through the lens of IPE, I focus on the ability of states to influence international production to suit their political goals. Since GVCs are governed by MNEs, in this setting, a state can achieve its goal through affecting the behaviour of MNEs. This can take many forms, from brokering international agreements, to introducing targeted export restrictions on certain firms, to using domestic policies to foster home-grown research and development activities which give a certain country a technological edge in transnational—and consequently, in international—competition.

In summary, to be able to investigate how and with what degree of success states are able to influence MNE behaviour, I will look at dependent variables which represent economic outcomes; and will analyse independent variables which represent levers used to alter the economic outcomes.

1.7 Dissertation outline

The Chapter 2 of the dissertation provides a descriptive background to the analytical work through a brief, data-based overview of East Asian regional production network development, and two case studies showing the deep international linkages, as well as efforts by nation states to influence these linkages in two state-of-the-art industries.

The first section of the chapter looks at qualitative measures of East Asia's intra-regional trade and investment flows and narrates the development of the regional production architecture through a mix of data and literature review. The second section introduces qualitative measures to paint a more nuanced picture of production linkages. I explore trade data, and data on trade in value added to measure GVC links among regional economies, as well as that of between East Asia and other regions.

Chapter 3 investigates the first sub-research question through quantitative means. The first section of the chapter introduces the main independent variables which influence the international flow of goods, services, and capital, namely FTAs, domestic economic policies, global institutions, and exogenous factors, and briefly discusses the channels through which the influence of these manifests. The second section of the chapter operationalizes these independent variables and sets up a gravity model to empirically examine the correlation between the independence variables and intra-regional trade flows as the dependent variable. The results show that domestic factors and the WTO remain the most important determinants of trade flows among East Asian countries.

The second part of Chapter 3 sketches a different empirical model to further investigate the sub-research question. This time, the aim is to capture the determinants of GVC participation for East Asian economies. Previous research from the World Bank (2020) will be relied upon to construct a regression model where the dependent variables are indices of GVC participation, and the independent variables follow the logic of the first model in representing the likely influencing factors of GVC activity based on trade theory. The results show that East Asia is highly reliant on FDI and domestic capital for GVC participation, albeit tariffs play a less meaningful role. In this model, domestic political factors are less significant as in the first one, but institutional factors play an important role.

Chapter 4 deals with the second sub-research question by analyzing the asymmetries of interdependence through qualitative measures. First, I look at traditional measures of economic interdependence, such as gross trade values, trade hubness and

centrality, and indicators of technological sophistication. In the second part of the chapter, I investigate financial measures of interdependence through FDI data to discern the main dependencies in East Asia.

In the second part of Chapter 4, I use Input–Output (IO) tables to calculate qualitative sectoral and national measures of export dependence and import dependence, and GVC position among East Asian countries and their main extra-regional partners. I compute measures to capture the networks of value-added in regional trade flows and calculate the dependence of industrial production in regional states and blocs on intra-regional and extra-regional partners by breaking down IO data. In the final part of the section, I introduce a measure of regional economic influence derived from the previously calculated indicators on FDI, trade hubness, trade sophistication, and market power to measure the relative importance of intra- and extra-regional powers in East Asian economic affairs.

Chapter 5 provides two case studies to illustrate the limitations of market power, and chokepoint effects under the conditions of production network interdependence. The first one deals with the US–China ‘trade war,’ and analyzes why the US policies were unsuccessful in reaching the strategic aims of the US in spite of its substantial economic leverage *vis-à-vis* China as the largest market of Chinese exports. The second case study explores the concurrent trade frictions in semiconductor manufacturing. The section discusses the heavily fragmented production network of the sector, the main chokepoints involved within, as well as the recent securitization of these networks as part of the China–US ‘strategic competition.’ The study concludes that the US was successful in using chokepoint effects against three Chinese companies, but the fragmented and interdependent nature of the semiconductor industry and the domestic political economy implications of the restrictions placed on Chinese companies meant that the damage was limited, and some of it was absorbed by the US itself.

Chapter 6 builds on the findings of the previous chapters to link economics with contemporary regional politics. First, I use a gravity model to empirically investigate whether international political frictions have a statistically significant effect on trade in East Asia. Second, I examine the decoupling thesis through financial and value-added data and conclude that East Asia has not been decoupling in recent years. In the final part of the chapter, I look at the different institutional strategies of regional states and investigate what sort of effect these strategies should have on the distribution of economic power and the gains from economic engagement.

2 Historical overview

2.1 Precursors to regionalization

While it would be well beyond the scope of this dissertation to engage in a detailed discussion on the history of East Asian international relations, it is worthwhile to overview at least briefly the nature and changes of the regional international system and that of international economic exchange prior to 1945, for historical experiences did play an important role in shaping the nature of transnational contacts in the post-1945 period, and also provide a broader systemic context for this study.⁴

A brief look at history shows that Asia was an open region fully involved in the world economic system as far back as pre-modern times. The region had an instrumental role in the global division of labour and its conduct in the world economy was open and outreaching (Sakakibara & Yamakawa, 2003). East Asia had extensive and well-developed commercial systems long before European powers arrived in the region from the fifteenth century onwards (Dent, 2008, pp. 40–42). A maritime trade regime connected East Asian ports not only through trade, but also through migration, finance and technology linkages (Hamashita, 1997). Moreover, East Asia was the largest and probably also the richest regional economy in the world prior to the 19th century. According to Frank (1998, p. 166), Asia had the preponderant position in the world economy “not only in population and production, but also in productivity, competitiveness, trade, in a word, capital formation until 1750 or 1800.” Thus, from a historical perspective, the sharp rise in cross-border economic exchange and the rapid economic development in East Asia after 1945 is nothing ‘new’; in fact, it might be conceptualised more appropriately as a return to a long-established pattern of international relations in the region.

In the years immediately after the war, the fragmentation of East Asia prevailed, and the division of the region was perpetuated by two intermittent processes: the Cold War and decolonisation (Pempel, 2006, p. 7). Although the US, as the preponderant power in the region and also globally, sought to demilitarise Japan and integrate China into the post-war international order, the emergence of the Cold War, the outbreak of the Chinese civil war, the subsequent triumph of the communists in it, and the Korean War

⁴ It should be noted that this short section presents a very simplified version of East Asia’s history. Nevertheless, it does provide a basic understanding of the main characteristics of East Asian international relations, and the shifts thereof.

resulted in a profound shift in Washington's calculations. Stabilizing non-communist Asia in the face of China's ideological challenge and military onslaughts, while simultaneously weaning Asia from China's economic attraction, became crucial priorities for the US (Calder, 2004, p. 143).

Security and economic considerations were inextricably mixed in American policy. A revived Japan was both a bulwark against communism and a critical element in a reformed world economy (Cumings, 1984, p. 14). This policy resulted in US assistance to its newfound allies, but also led to American-designed and -designated restrictions on their economic ties with communist countries (Shaller, 1985). In this sense, the Cold War division and related US policies in East Asia had an ambivalent effect on regional order: on the one hand, they constrained the re-emergence of such a broad regional trade regime which existed prior to colonisation; on the other hand, they stabilised the economies of anti-communist nations in the region and assisted their development, planting the seeds of market-driven regionalisation. As the following table outlines, most emerging economies in the region integrated into the US-led economic order, joined institutions such as the General Agreement on Tariffs and Trade (GATT), the International Monetary Fund (IMF), the World Bank (WB), etc., and traded extensively with the US.

Moreover, in East Asia there emerged a third group of countries in the form of the self-proclaimed non-aligned 'Third World' nations (Hara, 1999). After the fall of the Japanese empire, Western states sought to recapture their former colonies in Southeast Asia, which resulted in an eventually successful decolonisation struggle for independence in these states. Most of the regional interaction in the post-war years among these states took place under the umbrella of anti-colonialism, and the non-aligned movement proved to be not only the starting point of Southeast Asian regionalism (Hirakawa, 2013), but also one of the ideological constraints on wider and broader institutionalised cooperation in East Asia (Acharya, 2009).

Nevertheless, deeper institution-formation has eluded East Asia in this period. From a realist perspective, Crone (1993) argued that this was a result of the 'extreme hegemony' of the US. Given the enormous differences in relative power between the US and East Asian states, Washington had no imperative to form a multilateral framework which would have limited and constrained its strategic choices. Regional states had little to no material capabilities to offer to a multilateral alliance, and the US expected most of the states in the region to remain permanently weak.

Table 1. *Reliance on the US system in Post-WWII East Asia.*

	<i>Independence /regaining of sovereignty</i>	<i>IMF/WB- accession</i>	<i>GATT/ WTO- accession</i>	<i>US Share in Exports (per cent)</i>			
				1948-55	1956-65	1966-73	1973-80
<i>Japan</i>	1952	1952	1955	19.8	28.4	30.4	24.3
<i>S. Korea</i>	1948	1955	1967	30.7	28.2	41.4	30
<i>Singapore</i>	1963/65	1966	1973	n.a.	8.9	13.4	14
<i>Taiwan</i> ⁵	n.a.	1945	1945/65	n.a.	19	38	24.4
<i>Thailand</i>	n.a.	1949	1982	28	15.3	12	11
<i>Malaysia</i>	1953/63	1958	1957	n.a.	n.a.	13.1	16.8
<i>Burma</i>	1948	1952	1948	0.9	0.5	0.7	2
<i>Philippines</i>	1946	1945	1979	65.7	50.6	40.5	32.6
<i>Indonesia</i>	1949	1954/67	1950	25.9	21.8	15.2	23.3
<i>Cambodia</i>	1953	1969	2004	28.4	12.8	2	n.a.
<i>Laos</i>	1947	1961	2013	0	1	0.8	0
<i>Vietnam</i>	1945/54	1956	2007	26.7	8.7	28.4	n.a.
<i>P.R. China</i>	1949	1980*	2001	n.a.	n.a.	n.a.	11.2

Sources: IMF, WTO, WB data, and Barbieri & Keshk (2012).

Hemmer & Katzenstein (2002) offered a concurrent constructivist explanation by positing that the lack of multilateralism in Asia stemmed from the lack of a collective identity binding together the states on the two sides of the Pacific. While the US saw its allies in Europe as “relatively equal members of a shared community,” it regarded Asian nations as “part of an alien, and in important ways, inferior community” (Hemmer & Katzenstein, 2002, p. 575).

In contrast, another constructivist author, Acharya (2009) argued that instead of US policy, Asian norms were the main reasons for the lack of institutional cooperation in the region. According to this account, Asian nations rejected multilateralism as a result

⁵ The Republic of China became a member of the IMF, WB and GATT in 1945, but due to the Chinese civil war and its effects, this membership was eventually not exercised. Taiwan became an observer at the GATT in 1965.

of the emergence of the norms of non-intervention, non-alignment and neutralism among them. East Asian leaders regarded treaty- and institution-based multilateralism in general, and a US-led regional pact in particular, as a threat to national sovereignty and regional autonomy, as a scheme that would undermine their newfound independence.

2.2 The changing patterns of economic and political relations

2.2.1 East Asian industrial catching-up

According to the ‘flying geese’ (FG) model, economic interconnectedness began to emerge and deepen in the region as a result of the changing patterns of production. This model explains the catching-up process of industrialisation in latecomer economies through three interconnected aspects: an *intra-industry*, an *inter-industry*, and an *international* one.

The first consists of a basic pattern where a single industry grows, tracing out three successive curves of import, production, and export. The first period is when manufactured goods are imported from abroad. In the second period, domestic production emerges, which is followed by the import of natural resources and machines and tools for production. The third period is of “export industrialisation when an indigenous production system is established” (Schröppel & Nakajima, 2002, p. 207)

The inter-industry aspect is a variant pattern in which industries are diversified and upgraded from consumer goods to capital goods, and from simple to more sophisticated products. Each cycle, either intra- or inter-industry, repeats the FG pattern enhancing the efficiency and competitiveness of an industry. The intra-industry cycle raises value-added and brings about the growth of an industry. A diversification of production through inter-industry cycles upgrades the structure of industries and exports (Kojima, 2000, p. 379). The international aspect of the model concerns the relocation of industries. Once the three successive stages outlined above are traced out, the export of consumer goods begins to decline, because by this stage those are put into production in less advanced countries. In the place of the decreasing export of consumer goods, capital goods begin to be exported. This pattern appeared on a graph as an inverse V-shape, resembling a flock of flying geese, hence the name of the model (Dent, 2008, p. 47)

The reinterpretations of the model—combined with Vernon’s product cycle theory and/or with the Heckscher–Ohlin theorem—have been utilised to describe and *Figure 1. The inter-industry and international aspect of the post-war FG model.*

Source: Kwan (2002, p. 4).

explain post-war East Asian economic development and regional integration through the inclusion of FDI and the relocation of production (Kojima, 2000; Cumings, 1984).

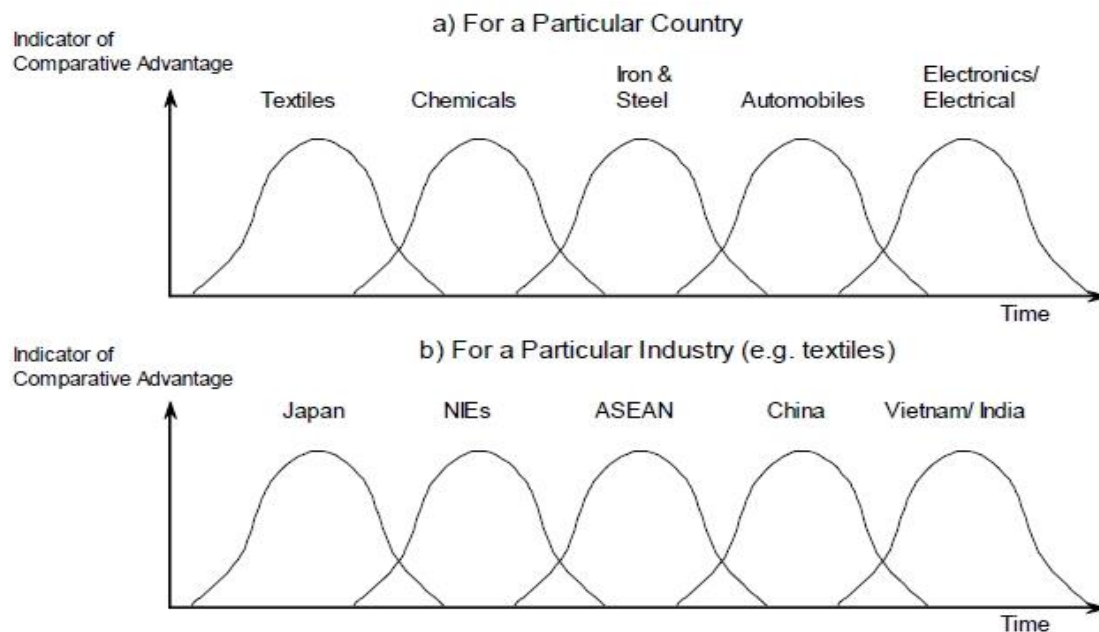


Figure 1 presents the basic post-war FG model. In practical terms, this mechanism was based on Japan's role as the technologically most advanced economy (the lead goose), and the international division of labour in East Asia developed as Japan had become increasingly specialised in advanced industries while shedding domestic production in sectors in which its comparative advantage had diminished. From the 1960s onwards, Japanese companies started relocating their labour-intensive production (textiles and basic electronics) to take advantage of lower unit labour costs in the less developed NIEs. The NIEs, in turn, upgraded their own industrial structures following the lead of Japan, and as they moved up the value chain over time, these following geese started to shed their outdated industries to neighbouring less developed economies, namely the ASEAN and China, thus creating a three-level pattern of industrial catching-up and development (Fujita & Hamaguchi, 2008, pp. 19–20). This process was also augmented by increasing flows of Japanese official development assistance from the 1970s, and extensive international lending by Japanese financial institutions in the region (Urata, 2003).

This FG pattern led to the creation of a broad regional division of labour through the relocation of production, in which national economies became increasingly interlinked through a mutual dependence on one another's inputs for manufacturing. This is what Kojima (2000) framed with the concept of trade-inducing FDI: the relocation of production led to rising trade links among national economies. The deepening economic

interaction in East Asia was essentially propelled by the activities of profit-maximising and cost-reducing MNEs, which came to organise their production processes and intra-firm structures on a regional basis (Fujita, Kuroiwa, & Kumagai, 2011, pp. 2–3).

Nevertheless, the FG paradigm is far from a universally accepted explanation of East Asian regionalization. Bernard & Ravenhill (1995, pp. 171–172) posited that the FG model fails to capture the complexity of the regional political economy, and that economic integration in East Asia has been driven by the globalisation of production networks, intergovernmental disputes over bilateral economic relationships, and technological change. Instead of the FG–product cycle model, they argued, the diffusion of manufacturing in East Asia was characterized “by shifting hierarchical networks of production linked both backward to Japanese innovation and forward to American markets for the export of finished goods.”

In any case, East Asian production network development had three general distinctive features: first, production networks were key elements in most of East Asia’s economic development, which is unique to its region in the world. Second, they tended to involve multiple countries, while similar fragmented production networks in other regions usually tie together two or three neighbouring economies. This is mostly the result of East Asia’s development asymmetries and the heterogeneity of comparative advantages. Third, East Asian networks comprise sophisticated combinations of inter- and intra-trade networked relationships (Dent, 2008, p. 52). Production network development led to the fragmentation of production, and the agglomeration and concentration of manufacturing economies around the region, above all in the automobile and electronics industry (Fujita & Hamaguchi, 2008).

2.2.2 The changing politics of regionalization

East Asia growing industrial prowess and Japan’s rapid technological catching-up led to political frictions with the US as early as the 1970s. By then, the costs of hegemony and the decrease of its relative competitiveness started to overwhelm the US economy, and consequently Washington’s tolerance for the free-riderness of emerging East Asian (and European) economies was waning rapidly. The collapse of the Bretton Woods System and the oil crises of 1973 and 1980 pushed the US on an increasingly (counter-)protectionist path, which culminated in higher trade barriers for Japan, coerced ‘voluntary export reductions’ on (fuel-efficient) Japanese automobiles, and threats of trade restrictions in the semiconductor sector (Ito, 1992, pp. 365–380). These measures

resulted in changes in Japan's trade and investment patterns, which shifts were heavily augmented by the most important one of the numerous economic realignments coerced by the US in the post-Bretton Woods era: the Plaza Accord. One source of bilateral tension was the yen's exchange rate, which was kept low to support exports through price competitiveness. Bowing to US pressure, Japan, as well as West Germany, the United Kingdom and France, agreed in 1985 to intervene in the currency markets to depreciate the US dollar and appreciate their currencies. The effects of the Plaza Accord were twofold. First—coupled with the Bank of Japan's misguided monetary policy—it contributed significantly to Japan's 'lost decade,' as “decades of undervalued yen had pumped massive amounts of liquidity into Japan, and when this was met with low interest rates and confidence that the yen could only strengthen, the result was one of the largest asset bubbles in history” (Devine, 2010).

On the regional level, however, the Plaza Agreement had translated into a boom of Japanese investment overseas, fuelled partly by the appreciation of the yen, and partly by the desire of Japanese MNEs to circumvent US trade barriers through the relocation of production. Moreover, the sharp rise of the yen (which gained 40 per cent in 1985–87) gave a window of opportunity to South Korea and Taiwan, since their price competitiveness rose rapidly in the immediate post-Plaza years. But this in turn led to pressure from the US for currency appreciation and market liberalisation in these economies as well. Consequently, South Korean and Taiwanese FDI exports also rose dramatically in the post-Plaza years to Southeast Asian countries and China, which countries were depreciating their own currencies at the time, had much lower labour costs, and started introducing incentives for foreign investors. Japanese FDI to East Asia rose fivefold, and South Korean FDI rose 33-fold in the ten years after the Plaza Accord.

These developments also changed the composition of Japanese FDI: from this point on, FDI in basic manufacturing within East Asia went predominantly to the ASEAN nations and China, while Japanese companies started to invest in the services and advanced manufacturing sectors of NIEs. The revaluation of the yen changed Japanese firm's procurement strategies as well. As it became cheaper to import components and other inputs from overseas, Japanese MNEs started to regionalise their input procurement, which further spurred the development of regional production networks, as well as the rapid spatial expansion of those into Malaysia, coastal China, and Thailand (Bernard & Ravenhill, 1995, pp. 179–183; Dent, 2008, pp. 47–49). In short, the US' turn to protectionism in the 1970s and 1980s inadvertently led to the expansion of regionalisation

in East Asia. However, in the long run it failed to change the patterns of trade in the Asia-Pacific: the triangular trade relationship remained in place (Bernard & Ravenhill, 1995, pp. 200–205), as East Asian economies continued to run large trade surpluses with the US on the one hand, and deficits with Japan on the other.

2.3 The emergence of regional institutions in the 1990s

2.3.1 Global and regional structural changes at the end of the Cold War

The end of the Cold War and the global systemic change it had resulted in had important transformative effects on East Asian regional integration. A common narrative in the discourse is that in the post-Cold War era, the logic and nature of East Asian integration started to change slowly but definitively from that of market-driven regionalisation to that of politically-led, institution-driven regionalism (Urata, 2019). But it was not the end of the Cold War itself, but rather other external events and internal factors coinciding with—and mostly unrelated to—it which created the imperative for this transformative process culminating largely—but not exclusively—within, and around, the ASEAN.

Four such external factors should be highlighted. First, the European integration process played an important role in shaping post-Cold War East Asian interactions. But instead of serving as an institutional example to be followed, Europe in fact contributed to East Asian institutionalisation by becoming a source of worry for nations in the region. The adoption of the Single European Act in 1987 and with it the impending establishment of the European single market, as well as the drafting process of the Treaty of Maastricht and the implementation of an economic and monetary union envisioned by it raised the fears that a solidifying ‘fortress Europe’ would divert trade and investment from, and would be an increasingly powerful competitor to, East Asian economies.

Second, East Asian countries followed with similar anguish the process which led to the formation of the North American Free Trade Agreement (NAFTA) in 1994 between the US, Canada and Mexico, especially because it carried the potential risk that the US, their main export market, would increasingly turn to imports from Mexico. Third, the setbacks of the Uruguay Round negotiations within the GATT proved the deficiencies of global-level coordination in trade issues and gave impetus for the deepening of regional-level cooperation among East Asian economies.

Fourth, one set of direct results the end of the Cold War had on East Asian calculations were the political and economic system changes in Eastern Europe. In the

face of the rapid economic and political liberalisation in the disintegrated former Eastern bloc, developing East Asian nations feared that this region could emerge as a direct competitor of theirs for foreign investment, and that these changes would shift the US' economic attention and realign it towards (Eastern) Europe (Mattli, 1999, pp. 166–168; Hill & Menon, 2010, p. 5). In sum, these four factors combined—which were in no case unrelated to one another—raised the fear that East Asia could lose its economic attractiveness and dynamism and may fall behind other regions, which were involved in increasingly intense regional institutions-building attempts at global coordination.

The shifting dynamics of the regional economic and political architecture also had a profound effect on the institutional changes in East Asian regionalism. Similarly to the external ones, four such intra-regional are notable. The first of these was the rapid growth of the Chinese economy after its opening-up at the end of the 1970s, through which China has emerged to become an increasingly central player in the regional and global economic architecture as a hub for commerce and manufacturing. China's rapid rise posed a challenge for developing East Asia, above all the ASEAN, for China started to emerge as both a competitor for foreign investment (Hill & Menon, 2010, p. 5) and a political force to be reckoned with.

Second, Japan's bubble economy burst in the beginning of the 1990s, and Japanese firms subsequently saw the rapid erosion of their erstwhile leadership in key sectors to American competitors (Ernst, 2006, p. 162). While Japan wrestled—mostly unsuccessfully—with its economic problems amidst political inertia, the FG model of East Asian regionalisation began to slowly disintegrate, not least because Japanese companies became increasingly reluctant to export jobs and Japanese banks slowed the expansion of lending to East Asia during the domestic economic downturn (MacIntyre & Naughton, 2005, pp. 85–86).

Third, the end of the Cold War had a profound effect on the security relations in the region. Gone was the Soviet Union and with it the preeminent common threat which served as the main strategic stabiliser in US–China and China–Japan relations. Instead, new (material) sources of regional tensions arose in the Taiwan Strait, the South China Sea, the East China Sea and North Korea, and misgivings rooted in historical misdeeds began to come to the fore of the international agenda as well. While US military presence remained considerable in the region in light of these challenges, the demand for regional solutions nevertheless grew. Moreover, even though some observers have conceptualised the 1990s as America's “unipolar moment” (Krauthammer, 1990), the direct involvement

of the US in the region nevertheless faltered in the post-Cold War era, and the ability of the institutions of the US hegemony to structure the nature of economic relations have become weaker in East Asia (and also other regions of the world).

Fourth, as the scale of East Asian economies and that of their external transactions expanded, there emerged a need for international frameworks to contain the tensions arising from the rapid structural change in the region (Garnaut, 2000, p. 1), which tensions were detailed in the previous chapter. In addition, the rapid development of the ASEAN countries and the lack of a competing institution in East Asia emboldened them to try to play a decisive role in this process (Mattli, 1999, p. 167).

2.3.2 The first examples of institutionalization

The changes of the international structure led to increased impetus for institutionalization in the region and beyond.

2.3.2.1 *APEC*

The first institutional frameworks to emerge was the Asia-Pacific Economic Cooperation (APEC). APEC was rooted in previous processes aimed at fostering economic regionalism in the Asia-Pacific, namely the Pacific Trade and Development Conference (PAFTAD) and the Pacific Economic Cooperation Council (PECC), both of which were initiatives launched and guided by Australia and Japan.⁶ The original objectives of the APEC were threefold: to offer regional support for trade liberalisation in the global economy; to promote cooperation among Asia-Pacific economies on trade, investment and other economic issues; and manage the problems arising from growing regional economic interdependence (Acharya, 2009, pp. 152–153). But the APEC's objectives, as well as its institutional setting, proved to be issues of discontent among the Asian and Western participants. Australia proposed that APEC be modelled on an OECD-style organisation. This proposal was outright rejected by other East Asian member countries, which preferred a looser, less institutionalised, consensus-building arrangement, in line with their normative approach to regionalism⁷ (Garnaut, 2000).

⁶ The PAFTAD was established in 1968 as an informal 'Track-II' academic forum for economic issues, which later on brought together Japan, the US, Australia, New Zealand, Canada, and the ASEAN. Similarly, the PECC, established in 1980 by Japan and Australia, and comprising of 23 member committees, is an informal network of individuals and domestic institutions the goal of which is to develop ideas related to regional policy coordination.

⁷ In fact, the ASEAN laid out four explicit conditions for the acceptance of APEC: that it should not deal with political and security issues; it should not lead to the formation of a trade bloc; it should not reduce the importance of existing regional institutions; and that ASEAN's machinery should be the centre of the APEC process (Acharya, 2009, p. 152)

Consequently, it was the Asian approach that prevailed, and as a result, APEC would foster closer economic relations on a trans-regional scale through inter-governmental consultations and other non-binding mechanisms (Dent, 2008, pp. 121–122). East Asian and Western members had different priorities regarding the goals of the organisation as well. While Australia and the US pushed for trade liberalisation within the grouping, and a requirement for reciprocity in this regard was central to Washington's approach, Japan—given that official barriers had not proven to be major obstacles for its companies in the region, and fearful of the political backlash from an aggressive liberalising agenda—instead emphasised APEC's potential to play a role in trade facilitation, and the importance of economic and technical cooperation in encouraging commerce in the region. Similarly, East Asian developing economies were mostly interested in APEC's work on economic and technical co-operation programmes (Dent, 2008, p. 122)

Nevertheless, the APEC formulated ambitious goals after its establishment in 1989, and its membership continued to expand, incorporating many of the world's most important economies.⁸ At the Bogor meeting in 1994, APEC leaders proposed the creation of a 'free and open trade and investment zone' between developed member states by 2010, and by 2020 for the whole of APEC. Later on, Western members called for the establishment of a Free-Trade Area in the Asia-Pacific (FTAAP). However, the FTAAP is still a far cry from being established, and although the APEC itself proclaimed that significant progress has been made towards the achievement of the Bogor Goals until 2010, it remains disputed whether this was a result of the APEC or other corresponding factors.

2.3.2.2 The ASEAN economic agreements

The sudden and substantial systemic changes detailed above led to the emergence of a number of new initiatives within and around the ASEAN. First, Malaysian leader Mahatir Mohamad proposed the plan to establish an East Asian Economic Group (EAEG, later renamed East Asian Economic Caucus – EAEC) in 1990, comprising the ASEAN, China, South Korea and Japan. This initiative was partly motivated by the contentious issues related to the formation of the APEC, as well as the APEC's aim to foster 'open regionalism' and the inclusion of Western countries in that process. In essence, Malaysia wanted to keep East Asian economic coordination within East Asia and among East Asian

⁸ The founding members of the APEC were Australia, New Zealand, the US, Canada, Japan, South Korea, and the ASEAN member states. Later on, China, Taiwan, Hong Kong, Mexico, Papua New Guinea, Chile, Peru, Russia and Vietnam joined the organisation, until a moratorium was placed on enlargement.

nations, with the exclusion of extra-regional actors. But this initiative failed partly due to Japan's reluctance to assume the leadership role in the process, and partly due to the explicit opposition of the US.

Two years later, the ASEAN moved to strengthen cooperation among its members instead, and in 1992 it enacted the ASEAN Free Trade Area (AFTA) to reduce tariffs and NTBs to intra-regional trade among its membership, and also to spur FDI inflows into the ASEAN. This scheme was based on a Common Effective Preferential Tariff (CEPT) system, which stipulated that tariffs on goods should be reduced to levels between 0 and 5 per cent until 2008, which goal was later moved forward to 2003. The rules of origin were set at 40 per cent of the value of products. To accelerate intra-ASEAN economic integration, in 1995 the ASEAN Framework Agreement on Services (AFAS) was signed. This agreement had two objectives: to eliminate all restrictions to trade in services among member countries, and to expand the depth and scope of liberalisation in services trade beyond those undertaken under the General Agreement on Trade in Services (GATS). In 1998 the ASEAN Investment Area was launched to promote and protect cross-border investment among member states, which was subsequently expanded into the ASEAN Comprehensive Investment Agreement (ACIA) in 2009.

These initiatives resulted in a substantial reduction in tariffs across the ASEAN membership. However, only a very small percentage of intra-ASEAN trade actually utilised the AFTA preferential rates. This was caused partly by declining margins of preference as most favoured nation (MFN) rates also came down at the same time, according to Baldwin (2008: 459). The lack of private sector awareness, the lack of clarity in the application of the rules of origin, problems with customs procedures, and the lack of dispute settlement mechanisms also tempered the effects of tariff reduction. Moreover, some ASEAN members even backtracked from their original AFTA commitments, and the progress on the removal of NTBs were meagre, for there was no agreement on what these entail (Soesarto, 2005, p. 2).

In fact, intra-ASEAN trade-share grew from around 20 per cent in 1992 to around 23 per cent in 2003, despite the fact that average intra-ASEAN tariff rates declined from 12.76 to 3 per cent in the same period (Mikic, 2009, pp. 9–12). Some sceptical observers even asserted that there existed little scope for mutually beneficial economic exchange among ASEAN member states, for their economies were not complementary, there was meagre demand for integration among market actors, and ASEAN companies competed in the same industrial sectors (Mattli, 1999, p. 169).

However, the laggardness of intra-ASEAN trade-creation was not out of line with the priorities of ASEAN. As Chirathivat (2008, p. 94) argued, ASEAN looked at AFTA not as inward-looking trade liberalisation, but rather as an investment-driven integration framework that would serve as the ‘training ground’ of local firms for global competition.

2.3.3 The Asian Financial Crisis and its effects

The Asian Financial Crisis of 1997–98 is often regarded as a turning point which led to the emergence of new institutions in the region. By the late 1990s, most East Asian emerging countries pegged their currencies formally or informally to the US dollar, although much of their real economic activity was tied to the currency of their main trading partner, Japan. Consequently, the depreciation of the Japanese yen in 1995–1997 had a strong negative effect on the price competitiveness of other nations in the region. This, combined with the repatriation of capital from Japanese banks in Southeast Asia and interest rate raises from the Federal Reserve led to capital flight. These developments weakened the already vulnerable financial sectors of East Asian states substantially. By 1997, Thailand became unable to maintain its currency peg to the dollar, and the baht collapsed. Strong contagion from the baht crisis spread all over the region, the primary victims of which were South Korea and Indonesia, but virtually all economies in East Asia suffered to some degree the consequences of the crisis⁹ (Ito, Growth, Crisis, and the Future of Economic Recovery in East Asia, 2001, pp. 64–85).

In reaction to the crisis, Japan launched a liquidity provision to East Asian economies called the ‘New Miyazawa Initiative’ (NMI) in 1998, and in 2000, the finance ministers of the ASEAN, Japan, China and South Korea agreed to set up a system of bilateral currency swap agreements between their central banks as an extension of the NMI, which came to be known as the Chiang Mai Initiative (CMI). In the following years, a total of 16 bilateral arrangements were signed, and by 2007 these bilateral CMIs amounted to US\$82.5 billion¹⁰ (Dent, 2008, pp. 157–160). In 2009—as a reaction to the Lehman Shock in 2008—the participating states signed on to the multilateralisation of the CMI, which came into effect in 2010. Moreover, a decision was made in 2012 to expand the multilateralised CMI to US\$240 billion. Apart from the CMI, the Asian Bond

⁹ Again, it should be stressed that this is a very simplified and far from complete account of the crisis.

¹⁰ Moreover, the CMI system also included an information exchange and early warning mechanism on short-term capital movements; a dialogue framework for reforming the international financial architecture; and regularised meetings between finance ministers (Dent 2008: 157–60).

Market Initiative (ABMI) was launched in 2003 by the same states to facilitate market access and enhance market infrastructure.

The burgeoning financial cooperation described above has essentially come to existence within another new regional political framework which emerged after the crisis: the APT. The first APT meeting took place in 1999, and this forum became the first distinct East Asian institution which rests on the dialogue between the ASEAN, Japan, China and South Korea. Subsequently, the APT framework has been supplemented by the East Asia Summit since 2005. The EAS was first composed of the APT plus Australia, New Zealand and India, which states were invited to become participants in this process at the behest of Japan and Indonesia. The underlying aim of Japan was predominantly (geo)political: Tokyo wanted to enlarge the East Asian frameworks with like-minded (i.e. democratic) countries which it thought would be its partners in offsetting the rising influence of China in the ASEAN Plus process. In 2011, the EAS was further enlarged with Russia and the United States—one Chinese and one Japanese ally. In fact, the establishment of the EAS marked not only the spatial expansion of the ASEAN process—and debates about the exact scope of East Asia with it—but also a *de facto* leadership struggle between Japan and China within the region (Nabers, 2008, p. 12).

Similarly to the acceleration of its wider East Asian engagement, the ASEAN moved to deepen economic integration between its members as well. In response to the crisis, the ‘ASEAN Vision 2020’ was declared in 1997, confirming the goal of deeper integration, and the Hanoi Plan of Action was adopted in 1998 to this effect, moving forward the realisation date for the AFTA to 2002. In the second part of the 1990s, the ASEAN also enlarged its membership: in 1995 Vietnam, in 1997 Laos and Myanmar, and in 1999 Cambodia joined the Association.¹¹ This contributed to the enhancement of the ASEAN’s clout in East Asia and the Asia-Pacific. At the same time, it also complicated economic integration, as the so-called CLMV (Cambodia, Laos, Myanmar, Vietnam) countries were severely underdeveloped at that time, leading to a large gap in economic development among the members.

After the AFTA was finally in place by 2002, the organisation declared the ASEAN Concord II in Bali in 2003, outlining the ambitious goal of establishing an ASEAN Community by 2020, resting on three pillars: the ASEAN Economic Community

¹¹ Brunei joined in 1984. However, as Brunei is a small, oil-rich country, its accession did not have the same profound effects on integration as did the accession of the CLMV countries.

(AEC), the Security Community, later renamed Political and Security Community (APSC), and the Socio-Cultural Community (ASCC). In 2007, the ASEAN moved this date forward to 2015, while at the same time adopted so-called ‘Blueprints’ for the implementation of these Communities. Moreover, the ASEAN Charter was signed in 2007 and went into effect a year later, setting up the clear rules and the institutional framework of the organisation, as well as giving a legal personality to ASEAN.¹² The AEC went into effect on January 1, 2016, and brought further liberalization: the percentage of tariff lines subject to elimination in the ASEAN Trade in Goods Agreement (ATIGA) stood at 98.6 percent in 2020, a rate that is as high as that of the TPP (Ishikawa, 2021, p. 29). Moreover, ASEAN began to implement its “AEC 2025” roadmap after the inauguration of the AEC, which foresees services trade liberalization, the elimination of non-tariff barriers, and better digital connectivity, among other aims.

2.4 FTA proliferation in East Asia

2.4.1 FTA-proliferation in East Asia

While the ASEAN did establish an FTA among its membership, as noted above, its effects were rather meagre on intra-ASEAN trade. Moreover, even though institutionalised financial cooperation took root in East Asia after the 1997–1998 crisis, a multilateral free trade arrangement comparable to the AFTA failed to materialise on the broader East Asian scale. Instead, East Asian nations—following the path of least resistance, similarly to other regions of the world except for the EU—have endeavoured on a path of concluding an increasing number of bilateral FTAs either with intra- or extra-regional partners.

The most important catalyst for this was China’s rapid development in the 1990s and its WTO accession in 2001. Moreover, China also played an active part in facilitating the FTA-proliferation in East Asia with its proposal for a China–ASEAN FTA (CAFTA) in 2000. This scheme, which was eventually signed in 2002 and came into effect in 2010, triggered a ‘domino effect’ across the region, for other nations—most notably Japan and South Korea—feared that preferential liberalisation between their major markets would create discriminations against their goods (Baldwin R. E., 2008, pp. 462–4). Subsequently, both Japan and South Korea negotiated and signed their own FTAs with

¹² In fact, the ASEAN had assumed a legal personality a year before the EU did in 2009.

the ASEAN and concluded further bilateral economic partnerships with certain ASEAN member states.¹³

This has led to the so-called ‘noodle bowl syndrome,’ a tangle of overlapping bilateral FTAs (Baldwin R. E., 2008). This process created demand for the multilateralisation of FTAs, so as to bring clarity to the chaos of overlapping arrangements. Two broad and ambitious projects emerged to this end, the first being the Regional Comprehensive Economic Partnership (RCEP) among the ASEAN+6, the Trans-Pacific Partnership (TPP), originally among twelve countries on both sides of the Pacific.

2.4.2 The RCEP

These initiatives are of different origin, scope and aim. The guidelines and objectives of the RCEP negotiations were declared in 2012, and formal negotiations started in May 2013, with an aim to complete them by the end of 2015. A key principle behind the RCEP is that negotiations “recognise ASEAN centrality in the emerging regional economic architecture.” The RCEP aims to support and contribute to economic integration, equitable economic development, and strengthening economic cooperation among participating countries. The issue coverage of the negotiations included trade in goods and services, investment, economic and technical cooperation, intellectual property rights (IPR), competition and dispute settlement. Hence, the RCEP is an initiative centred around the ASEAN and based on the ASEAN Way, and it reflects and embodies the ASEAN member states’ main priorities.¹⁴ Furthermore, the RCEP is a response to the factors challenging ASEAN-centrality and a scheme to ensure that ASEAN remains in the driver’s seat of East Asian regionalism (Dupont, 2013).

¹³ It should be noted that FTAs concluded under the auspices of ASEAN—the AFTA, the CAFTA, and the treaties with Japan and South Korea, as well as further ASEAN+1 FTAs with Australia, New Zealand, and India—are essentially webs of bilateral deals instead of multilateral agreements. Under this system, participating economies conclude deals vis-à-vis one another, which are different in their scope, coverage, and rules of origins, and provide for the ‘sensitivities’ of each state. The advantage of these frameworks lies in their capacity to essentially sidestep economic issues which would be particularly hard to negotiate on a multilateral level. However, this also results in considerable disadvantages: first, as noted earlier, the coverage of these agreements is rather meagre; second, they contribute to the ‘noodle bowl syndrome’ instead of solving it, for the vast differences in each treaty add to the chaotic nature of the East Asian regional trade environment.

¹⁴ In part, the RCEP also reflects Japan’s preferences. Tokyo prefers what is called ‘comprehensive economic partnership agreements’ to FTAs, with the former including investment facilitations and protection measures. Japan is not very keen on trade liberalisation given that a number of its politically sensitive sectors are heavily protected, but it pursues investment liberalisation given the high levels of its FDI export.

On the one hand, the RCEP's liberalization agenda is modest compared to recent FTAs: the agreement eliminates 92 percent of tariff lines among its members, which is much lower than the tariff-free share of intra-ASEAN trade, and also lower than that of the CPTPP. On the other hand, the RCEP is an attempt to untie the noodle bowl of the ASEAN+1 FTAs concluded by the Association with the members of the ASEAN+6 framework, which all have different rules of origins and coverages, as well as vastly different tariff elimination measures. From this perspective, the potential effects of the RCEP might be quite substantial, coupled with the fact that this would be the first FTA between Japan and China, and Japan and South Korea. Nevertheless, as Japanese observers often point out, RCEP is more about the institutionalization of existing trade and investment ties and production networks than creating a whole new type of institutionalized integration (Solís & Urata, 2018).

The potential trade creation effects of the RCEP were also weakened by the fact that India ended up leaving the negotiating table in 2020. Since India is the most protectionist large market among the nations involved, most of the benefits of RCEP would have come from the opening of the Indian market. Consequently, this development substantially reduced the potential gains from the agreement.

After India's exit, the RCEP was signed among 15 countries instead of the ASEAN+6 in November 2020. After the agreement was ratified by Japan, Brunei, Cambodia, Laos, Singapore, Thailand, Vietnam, China, Australia, and New Zealand by November 2021, RCEP will enter into force on January 1, 2022.¹⁵

As underlined by Thangavelu, Urata, & Narjoko (2021), RCEP is currently the largest trade bloc in the world, comprised of states with a combined 30 percent of world population, 30 percent of world GDP in 2019, and 28 percent of global trade. As for the practical gains from the agreement, they point out that the RCEP introduces a single rule of origin framework for the participating 15 countries of 40 percent locally produced content at the HS4 classification level.

Another important benefit of the RCEP, as noted above, is the creation of a potential FTA between Japan and China, and Japan and South Korea. At the time of the submission of this dissertation, South Korea is yet to ratify the agreement. In the China–

¹⁵ The RCEP rules stipulated entry into force 60 days after at least six ASEAN members and a further three non-ASEAN member parties deposited their ratification instruments with the RCEP depositary. This threshold was reached on the 2nd of November 2021, after the submission of the ratification by Australia and New Zealand.

Japan relation, the agreement will go into force in 2022. In 2019, 18.4 percent of Japan's exports and 23.2 percent of its import were with China, and 5.9 percent of China's export and 8.1 percent of its imports are with Japan, the agreement will potentially lead to considerable reductions of costs for Chinese and Japanese enterprises.

Third, according to Thangavelu, Urata, & Narjoko (2021), RCEP will ease trade with the Least Developed Countries of Southeast Asia: Cambodia, Laos, Myanmar, and Vietnam. While, as shown in the next sections, Vietnam and Cambodia has increased its participation in regional production networks, they are still lagging far behind middle income countries such as Thailand or Malaysia in terms of economic openness. In the case of Laos, and Myanmar, GVCs have barely penetrated the countries, and their participation in regional and global trade is very limited.

Fourth, the RCEP provides key elements for services liberalization in the region, and creates some new rules for e-commerce, financial, professional, and telecommunications services, thereby opening up 65 percent of the services activities in member countries. Another important element in services liberalisation is that while ASEAN+1 FTAs had a positive list approach, meaning that the agreement stipulated which sectors are open to trade in services, the RCEP establishes a negative list approach, which means that states stipulate which sectors are not open to trade in services, and open the rest of their sectors.¹⁶ This is also important from the perspective of GVC activities, since even manufacturing GVCs are undergoing what is termed as 'servicification:' the services value-added of manufacturing is rising, and Asian countries experience a high level of foreign services use in their GVC operations (Thangavelu, Wang, & Oum, 2018).

2.4.3 The CPTPP

The TPP is a different breed of FTA. This process started in 2006 between four small countries (Brunei, Singapore, New Zealand, and Chile. The US joined the negotiations in 2008, along with further seven countries from both sides of the Pacific, including Australia, Canada, Mexico, and Japan in March 2013.¹⁷

The TPP is a much more ambitious project than the RCEP with a comprehensive coverage including not only market access, services and investment, but also labour, environment and cross-cutting horizontal issues such as regulatory coherence,

¹⁶ However, some RCEP members received a grace period to institute the shift from a positive list to a negative list approach.

¹⁷ China and South Korea also expressed interest in joining the TPP process.

competitiveness and business facilitation, development and SMEs. Moreover, full implementation would mean the elimination of 99 percent of tariff lines among members.

One of the main premises of the TPP is similar to that of RCEP: to “tame the tangle of PTAs and be a potential steppingstone to achieving the goal of liberalizing regional trade on a non-discriminatory basis” (Capling & Ravenhill, 2011, p. 553). But the practical differences of the two initiatives are numerous. First, while the RCEP follows ASEAN’s preferences, the TPP is geared towards the priorities of developed countries.¹⁸ Second, the TPP envisions a higher level of trade liberalisation than the RCEP. Third, the RCEP is a stepwise, gradual process, while the TPP is a single undertaking. This makes the RCEP theoretically easier to negotiate, but RCEP will take more time to become a deeper and thus a more effective vehicle for regional integration. Fourth, the RCEP is more flexible and offers special treatment to certain participants, while the only deviation the TPP allows for from its stricter and broader rules is the staging of commitments.¹⁹ Lastly, but most importantly from the perspective of the regional political economy, these two arrangements rested on conflicting strategic premises: while the RCEP aims to strengthen ASEAN-centrality, the TPP was often seen as a vehicle for the renewed economic engagement of the US in the region (Capling & Ravenhill, 2011).

The latter premise, however, no longer holds water. While the TPP agreement was signed on February 4, 2016, then-US President Barack Obama was not able to push the ratification of the agreements through Congress before the end of his term. Afterwards, the process took a sharp turn due to the election of Donald Trump as US president in November 2016. After his inauguration in January 2017, one of President Trump’s first official acts in office was to remove the United States from the TPP framework.

The remaining member states pledged to move forward with the treaty in the absence of US participation and signed a separate ‘TPP-11’ pact, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in March 2018. This agreement had been ratified by six of the participants (Australia, Canada, Japan, Mexico, New Zealand, and Singapore), and entered into force on December 30, 2018 among them. Naturally, the US pull-out decreased the wider significance of this treaty considerably: the combined market size of the participants dropped from 40 per cent of global GDP to

¹⁸ In fact, Vietnam is the sole developing member of the process.

¹⁹ Presentation by Shujiro Urata at Waseda University, Graduate School of Asia-Pacific Studies, Asia-Pacific Economic Studies course, July 2013.

13.4 per cent, although if the TPP-11 is ratified by all participants, it will still be the fourth largest free trade area in the world after the European Union and the US–Mexico–Canada Agreement,²⁰ and the RCEP.

Moreover, US trade politics under President Trump forced a substantial shift in East Asian trade: the United States began to openly challenge the global and regional trading architecture by initiating protective tariffs *vis-à-vis* Chinese imports on the ground of national security concerns arising from Chinese competition and Chinese violations of IPR (Liu & Woo, 2018).

One clear result of the trade war so far has been the strengthening of East Asia's resolve to move forward with liberalisation even in the absence of US involvement. As noted above, the TPP-11 decided to conduct the treaty without Washington, which signifies that participating states value the economic benefits and rule-creation of the TPP even without the increased strategic economic value that US participation would bring to the table. In other words, economic integration and WTO+ and WTO-X rule-creation is important for East Asian states in its own right (Solís & Urata, 2018). Second, the RCEP process have gradually sped up after the US retreat from TPP and the increasing hostility of the US government on trade issues not just *vis-à-vis* China, but against other regional states, including allies such as Japan and South Korea. Hence, as US trade policies threaten East Asia's prosperity, the region is appearing to be more willing to forge closer ties within, so as to balance and counter the external threats.

While Donald Trump lost the US presidential election in 2020, and former Vice President Joe Biden, a moderate Democrat was inaugurated as the new US President in January 2021, US trade policy did not revert back to the pre-Trump orthodoxy, potentially reflecting a deeper break with the American free trade ideologies of the past in light of the relative loss of economic power and competitiveness *vis-à-vis* China which some authoritative voices in the US theorize as the result of China free riding on US hegemony. U.S. Commerce Secretary Gina Raimondo underlined in November 2021 that a US return to CPTPP was not on the table (Takita, 2021).

At the same time, China formally applied for CPTPP membership in September 2021. Some days later, Taiwan also made a bid to join the treaty, and South Korea applied for CPTPP membership in December 2021. In addition to the East Asian applicants, the

²⁰ The USMCA is a slightly altered version of the North American Free Trade Agreement (NAFTA) which was signed in 1994 and entered into force in July 2020.

United Kingdom also requested to join the CPTPP after its exit from the European Union and started accession talks in August 2021.

The political and economic aims and potential consequences of these applications are hotly debated at the time of the submission of this dissertation. For instance, there is considerable scepticism among experts if China would be able to fulfil CPTPP commitments on State-owned Enterprises, government procurement, or competition policy, especially given the recent developments in the Chinese domestic regulatory environment. For these reasons, many observers view the application as a strategic ploy to further weaken US power in East Asia and advance the narrative of a China-led regional order (Shelton, 2021). Others suggest that the Chinese application would provide a strategic nudge to the US to reconsider its economic policies and strengthen its engagement with East Asia (Takahashi, 2021).

China's application, and the recent emergence of other prospective applicants also complicated the politics of CPTPP. Naturally, the prospect of Taiwan and China acceding the same treaty appears to be problematic diplomatically at a time when cross-strait relations show a negative trend. In addition, as noted in the introduction, at the time of the submission of its application, China was levying *de facto* import restrictions on Australia, and previously done so against the Philippines so as to pressure the Australian and Philippine governments in political and territorial disputes. Similarly, the UK has been becoming more vocal in its criticism of China's human rights record and its foreign policy and took steps to limit the involvement of Huawei in its strategic networks. The UK and Australia also entered into the 'AUKUS' submarine pact with the US, which is often conceptualized as an important element of US foreign policy aimed at 'containing' China's rise, or at least moderating the rise of China's maritime influence in the region. Hence, the CPTPP accession process will become a microcosm of the larger IPE question of China's rise, namely if continued economic reliance on China can go hand-in-hand with political hedging/balancing against the rise of China's maritime and political power.

The recent wave of East Asian and Asia-Pacific 'mega-FTAs' came into existence in an environment dominated by the decline of US economic engagement with East Asia, which turned to outright hostility toward Asian trade partners by 2018. This process, which had been termed the US-China 'trade war' by the US media, was exacerbated by the COVID-19 pandemic starting in 2020, which directed further political spotlight onto trade and GVC issues. The pandemic prompted a wave of criticism of the traditionally pro-free trade political consensus and led to the emergence of an intensifying discussion

on the strategic issues of trade and GVC reliance and the need to consider issues of economic security in developed economies.

Some researchers propose that the conclusion of the RCEP and the US-less CPTPP means that East Asia is decoupling from the United States (Petri & Plummer, 2020). According to these arguments, the US–China trade war and the COVID-19 pandemic highlighted the limits to extra-regional economic engagement and raised the value of regional arrangements, thereby boosting the benefits of East Asian ‘decoupling’ from the US market. These issues and the relevant analytic claims will be investigated in detail among other contemporary issues in chapter 5.

2.5 East Asian trade and production networks

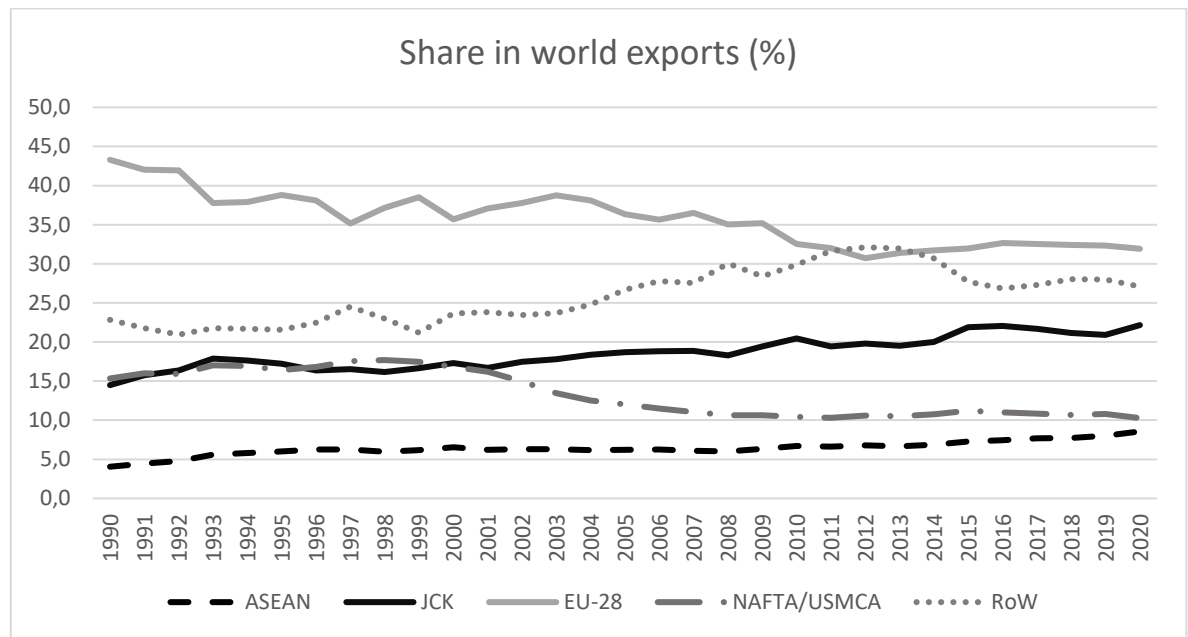
To supplement and contextualize the political history of regional economic integration, these sections will provide a mostly descriptive, data-based analysis of East Asian trade patterns and GVC participation, as well as the changes thereof.

2.5.1 Trade patterns in East Asia

As indicated in the introduction, East Asia has become one of the most important economic regions of the world over the past four decades. The APT’s share in world export has risen from 18.6 percent in 1990 to 30.8 percent by 2020, while the share in world imports increased from 16.1 percent to 27.5 percent.

The rapid rise of East Asia’s trade share went hand in hand with the declining relative importance of North America and Europe in world trade. As shown in the following figures, both regions have seen stark declines in their trade shares, so much so that in 2020 ASEAN’S share in world exports were close to that of the share of North America, even though the ASEAN’s GDP lags far behind.

Figure 2. Share in world exports by region.



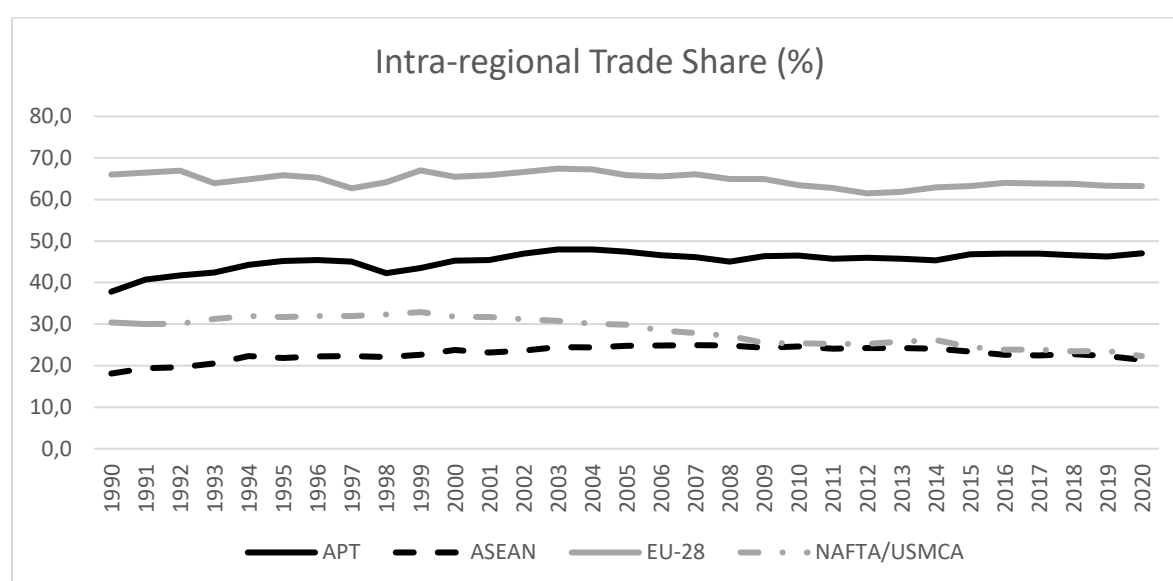
Sources: UN COMTRADE, ADBi.

Some of the rising share in world trade is attributable to the expansion of East Asia's intra-regional trade, which was climbing steadily between 1990 and the mid-2000s and has stabilized close to 50 percent since then. In contrast, the intra-regional trade share of the European Union, the Eurozone and well as North America has been on the decline for most of this period.

The rise of intra-regional share means that the weight of intra-regional economies in total APT trade has increased significantly since 1990. As the following table shows, while 30 years ago the US was the prime trade partner of East Asia, both China and the ASEAN has surpassed the US trade share vis-à-vis the APT since then. The data also reflects the changes in economic fortune within the region, with Japan losing a lot of ground to China, and is barely above South Korea, and Taiwan when it comes to its weight in regional trade, even though the size of its economy is much larger. Nevertheless, data also shows that East Asia continues to be a net exporter to the world economy, while North America remains a net importer. The political significance of this will be discussed later on.

The next table shows a detailed picture of the changes in import and export share by trade partners of major East Asian economies. A number of important conclusions can be drawn from the data.

Figure 3. Intra-regional trade share in various regions of the world economy.



Sources: Calculations based on the ADBi integration indicators database, and UN COMTRADE.²¹

First, unsurprisingly Japan's trade share has declined substantially for all regional trade partners. At the same time, Japan has grown heavily reliant on trade with China, both in terms of exports and imports. Second, the increased reliance on China is uniform for all economies: China is now the largest single market for the ASEAN and South Korea as well, although ASEAN's Chinese reliance is much weaker than for Japan and South Korea.

Third, in parallel with China's rise in regional trade, the importance of the US market has also decreased significantly for every East Asian exporter except China, where the decrease is more muted. Fourth, China has a far more diversified partner portfolio than other East Asian economies: almost half of its export are with economies not located in East Asia, Europe, or North America.²²

As discussed in the previous sections, the expansion of trade was helped by continuous tariff reduction, both unilateral, multilateral, and plurilateral. The following table shows the changes of the weighted mean applied tariff rates in East Asian economies *vis-à-vis* other East Asian economies.²³ As the table shows, applied tariff within the

²¹ The formula used for the intra-regional trade share calculations is the following: $((\sum_{sd} X_{sd} + \sum_{ds} M_{ds}) / (\sum_{sw} X_{sw} + \sum_{ws} M_{ws})) \times 100$.

²² In the case of ASEAN, while 45 percent of its exports are termed as headed to the Rest of the World in this table, intra-ASEAN trade account for around 20 percent of the ASEAN total, meaning that the export share of the real 'Rest of the World' is 25 percent.

²³ It should be noted that tariff data was not available for all years and all countries. Years shown in the table were chosen partly due to data availability. If a certain year on the table did not have data for a country, but either the year before or the year after had, then the data for those other years are displayed on the table.

region have decreased dramatically in the 2000s, and are negligible today for all but a few outliers. Similarly, applied tariffs on East Asian exports (which are represented in the row titled “World” in the table) have decreased substantially as well.

Table 2. The changes of export and import shares by partner economy between 1990 and 2020.

	1990		2000		2010		2020		X % change 1990- 2000- 2020	
China	Export %	Import %	X %	I %	X %	I %	X %	I %		
Japan	14,7	14,2	16,7	18,4	7,6	12,6	5,5	8,5	-9,2	-11,2
Korea	0,7	0,4	4,5	10,3	4,4	9,9	4,4	8,4	3,7	-0,2
ASEAN	6,6	5,8	7,0	9,5	8,8	11,1	14,8	14,6	8,2	7,9
USA	8,5	12,2	20,9	9,9	18,0	7,3	17,4	6,6	9,0	-3,5
EU	10,0	16,2	13,8	12,1	17,4	11,3	15,1	12,6	5,1	1,3
RoW	59,5	51,1	37,1	39,7	43,9	47,8	42,8	49,2	-16,8	5,7
Japan										
China	2,1	5,1	6,3	14,5	19,4	22,1	22,0	26,0	19,9	15,7
Korea	6,1	5,0	6,4	5,4	8,1	4,1	7,0	4,2	0,9	0,5
ASEAN	11,6	12,7	14,3	15,7	14,7	14,6	14,4	15,7	2,8	0,1
USA	31,7	22,5	30,1	19,1	15,7	9,9	18,5	11,4	-13,1	-11,6
EU	17,0	14,1	13,8	10,8	9,5	8,7	9,2	11,4	-7,8	-4,5
RoW	31,5	40,6	29,1	34,4	32,7	40,6	28,9	31,4	-2,6	-0,2
Korea										
China	0,3	0,6	10,7	8,0	25,1	16,8	25,9	23,3	25,5	15,1
Japan	18,6	25,0	11,9	19,9	6,0	15,1	4,9	9,8	-13,7	-7,0
ASEAN	7,6	6,9	11,7	11,3	11,4	10,4	17,4	11,7	9,8	5,7
USA	28,6	22,8	22,0	18,3	10,7	9,5	14,5	12,4	-14,1	-7,4
EU	12,6	10,6	11,4	8,5	10,3	8,3	9,3	11,8	-3,3	-2,1
RoW	32,2	34,2	32,4	34,1	36,5	39,8	28,1	31,0	-4,2	-4,3
ASEAN										
China	1,8	2,9	3,8	4,9	10,8	13,3	16,0	22,7	14,2	12,2
Japan	18,8	22,9	13,3	18,8	9,8	12,3	7,4	8,2	-11,4	-5,8
Korea	3,3	3,1	3,6	4,7	4,3	6,0	4,3	8,4	1,0	0,7
USA	19,3	14,3	18,7	13,8	9,6	8,8	14,3	8,0	-5,0	-4,4
EU	12,8	12,5	11,9	9,2	9,5	8,3	9,0	7,7	-3,8	-2,9
RoW	43,9	44,3	48,7	48,6	56,1	51,3	48,9	45,0	5,0	0,2

Source: Own calculations based on the ADBi integration indicators database.

The situation is similar when we look at duty elimination by the number of duty-free tariff lines. While in the late 1980s and early 1990s, around 29 percent of tariff lines were duty free among East Asian economies, the rose to 40 percent by the millennium, 52 percent by 2010, 68 percent by 2015, and reached 80 percent by 2018, after the conclusion of the CPTPP, and before the entry into force of RCEP.

Table 3. Tariff rate, applied, weighted mean, on all products, vis-à-vis East Asian trade partners.

	1990	1996	2000	2005	2010	2015	2018
Brunei		13,0	12,4	5,4	2,2	0,1	0,0
China	31,8	20,4	14,6	5,1	5,4	5,0	2,5
Indonesia	18,5	9,3	5,8	3,9	2,0	2,0	0,9
Japan	4,3	5,5	3,9	3,2	2,3	2,2	2,0
Cambodia			16,2	10,8	9,9	4,7	
Korea	10,6	10,0	10,3	8,2	4,9	5,3	4,1
Laos						2,1	0,6
Malaysia	11,4	6,7	5,3	5,0	2,8	4,8	
Taiwan		4,8	3,4	2,4	2,0	2,1	1,8
Philippines		9,3	4,5	3,6	3,8	0,9	0,7
Singapore	1,7	0,1	0,0	0,0	0,0	0,0	0,0
Thailand	34,9	17,1	11,2	5,4	6,1	1,7	
Vietnam			17,0	12,1	5,0	2,4	3,5
World	17,0	10,2	8,4	6,7	5,6	4,8	4,5
East Asia & Pacific	8,8	6,1	5,5	3,8	3,4	2,8	1,8

Source: Own calculations based on data from the World Integrated Trade Solutions (WITS) database.

Interestingly, however, the difference in average weighted tariffs applied by East Asian economies on all partners and intra-regional partners did not show a clear preference for intra-regional partners until recently. As the following table attests to, even in 2005, only four East Asian economies levied lower applied tariffs on other East Asian economies than on all countries, and the largest economy of the region, China has charged higher rates for intra-regional than global exports. Furthermore, even in East Asian states where there is a clear discount for intra-regional trade partners presently, the difference is insignificant in most cases: although all of the countries for which data are available levied lower tariffs on intra-regional than all imports, the intra-regional ‘discount rate’ remained under one percentage point for all but two of them.

It should also be noted that global importers levy higher duties on East Asian goods than on all imports, meaning that East Asian exporters pay a penalty on the global market compared to all exporters.²⁴

²⁴ Much of this difference, however, can be explained by the fact that the EU is counted as 27 separate economies in global trade, whereas it is a single market with no internal duties and large internal trade values.

Table 4. The difference between the applied weighted mean tariff rate applied on all imports and East Asian imports.

	1990	1996	2000	2005	2010	2015	2018
Brunei		-1,6	-4,6	0,4	0,3	0,4	0,0
China	0,4	-0,6	0,1	-0,3	-0,8	-0,5	0,8
Indonesia	-3,4	-1,6	-0,7	0,0	0,5	0,6	1,1
Japan	-0,7	0,1	0,6	0,4	-0,1	0,1	0,4
Cambodia			0,2	0,0	-0,4	0,1	
Korea	-1,0	5,0	-0,8	-0,3	2,3	0,4	0,7
Laos						0,3	0,1
Myanmar			0,0		0,0	0,1	0,5
Malaysia	-0,6	-0,4	-0,5	-0,7	0,4	-0,7	
Taiwan		0,1	0,3	0,0	0,0	0,0	0,0
Philippines		-0,7	-0,7	-0,4	0,1	0,9	1,4
Singapore	1,6	0,0	0,0	0,0	0,0	0,1	0,2
Thailand	-34,9	16,5	-1,6	-0,5	-1,1	1,9	
Vietnam			-1,7	-0,8	0,0	0,7	0,9
World	-10,2	-4,1	-3,4	-3,2	-2,3	-1,8	-1,9
East Asia & Pacific	6,2	7,1	4,7	1,1	1,0	1,4	1,7

Source: Own calculations based on data from the World Integrated Trade Solutions (WITS) database.

2.5.2 Slowbalization and East Asia

As noted in the introduction, one of the key features of the 2010s were a marked slowdown in the pace of global trade expansion. This process had important repercussions for East Asian trade, both intra- and extra-regional. While the pace of export growth remained substantial compared to other parts of the world, it has slowed down markedly in recent years.

The following table shows the changes in export values for East Asian economies on a five-year basis, comparing the change in percentage between the most recent five-year period and the five-year period preceding it.²⁵ According to the data, export growth was negative in absolute terms for Japan, South Korea, Singapore, and Brunei,²⁶ while also near zero for Thailand, and Malaysia.

²⁵ The value represents the change between the combined export value of the last five-year period compared to the previous five-year period. For example, the data for the year 2000 shows the percentage change between the summary of the export of each country between 1996 and 2000, compared to the summary of the trade values of the period between 1991 and 1995. The five-year period is used in order for the values to be more representative of long-term phenomena instead of often volatile year-to-year changes.

²⁶ As a relatively small economy heavily dependent on crude oil exports, the export values of Brunei are very volatile, and more of a reflection of the global oil prices, than Brunei's trade integration.

While the trade expansion continues to be strong for developing countries of the region, the global slowdown had a very pronounced effect on the traditional trading states of East Asia, showing the limits of a goods trade-based strategy for middle-income and high-income economies in the contemporary world economy.

Another message from the figure is that East Asian intra-regional trade held up better than world trade in recent years, showing the development of regional production networks and the strength of the regional trading system.

Table 5. Changes in trade values between the most recent and the preceding five-year periods.

	2000		2005		2010		2015		2020	
	APT	World	APT	World	APT	World	APT	World	APT	World
Brunei	-11	-7	96	83	3	8	33	34	-30	-29
Cambodia	34	92	62	93	122	100	105	99	89	82
China	57	75	130	157	119	156	64	70	8	9
Japan	29	19	41	19	59	49	22	15	-9	-11
Korea	47	46	62	43	92	90	43	39	4	-3
Laos	82	57	34	26	241	206	170	163	23	22
Malaysia	48	51	36	30	66	60	36	30	3	0
Myanmar	89	92	75	72	59	54	122	95	35	49
Philippines	113	101	43	21	45	34	29	22	55	41
Singapore	43	43	34	26	84	82	28	30	-5	-6
Taiwan	46	40	51	32	64	53	36	29	14	9
Thailand	29	29	56	41	93	89	49	44	5	1
Vietnam	162	176	97	111	160	158	114	112	78	77

Source: Own calculations based on data from WITS and ADBi databases.

2.5.3 FDI in East Asia

The expansion of trade and GVC activities went hand in hand with the expansion of FDI flows and stock. As the following table shows, FDI was nearly inexistent in most East Asian economies—apart from Singapore and to some extent Malaysia—before the Plaza Accord. During the 1990s, however, inward FDI stocks began to increase at a rapid pace, and by the 2000s, even the least developed countries of the region came to host a substantial amount of inward FDI.

Nevertheless, there are of course significant differences among inward FDI stock in regional states. Naturally, the relevance of FDI is weaker in larger economies. Japan

hosts very limited inward FDI in relation to its economic size. South Korea had similarly meagre levels of inward FDI for most of its high-growth years, although the level of inward FDI has increased markedly in recent years.

Table 6. *Inwards FDI stock as a percentage of GDP.*

	1986	1990	1995	2000	2005	2010	2015	2020
Brunei	1	1	12	57	40	47	67	90
Cambodia	0	0	14	43	39	55	121	142
China	2	3	12	19	21	26	24	22
Indonesia	4	5	8	11	14	23	27	24
Japan	0	0	1	1	2	4	5	8
Korea	2	3	3	8	11	12	12	16
Laos	0	1	6	36	26	36	44	61
Malaysia	20	22	28	36	32	45	45	58
Myanmar	0	10	22	41	38	23	12	41
Philippines	3	5	10	13	15	15	20	28
Singapore	70	85	89	136	186	264	354	546
Thailand	6	9	11	25	33	42	47	58
Vietnam	0	3	22	37	31	40	43	52
Taiwan	3	4	4	6	11	14	12	17
Hong Kong	106	92	184	287	313	508	571	578
China, HK, Macao	14	88	72	52	42	44	39	35

Source: Calculations based on data from Lane & Milesi-Ferretti (2018)

While FDI has been playing an important role in China's industrial catching-up, inwards FDI stock peaked in the mid-2010s, and began to recede afterwards as a percentage of GDP, signifying that the growth of the domestic economy, especially real estate, and infrastructural investment, has become more important engines of growth. Adding up the numbers for Hong Kong, Mainland China, and Macao, does not alter this picture.²⁷

Apart from China, inward FDI stock as a percentage of GDP shows a steady increase in all the developing and middle-income nations of the region, albeit there are large differences in the levels. Cambodia became a heavily FDI-reliant economy from an insular one in two decades, while the Philippines as seen a steady but much slower growth in inward FDI. Malaysia, Thailand, Laos, and Vietnam have comparable levels of inward FDI, but the composition of it is very different: the latter two countries mostly host textile plants, and lower value-added assemblies, while the former have a larger footprint in the electronics and auto industries.²⁸ Myanmar has a shaky pattern of inward FDI, which

²⁷ Hong Kong and Macao were not parts of the People's Republic of China before 1997 but have nevertheless played a key role in facilitating cross-border finance and trade with China even before their reversion. While on the one it is unreasonable to consider Hong Kong or Macao capital Chinese, the numbers for these territories are important markers of business activity with China.

²⁸ Nevertheless, Vietnam is moving rapidly to expand its role in regional electronics production chains.

reflects the political risks of investment in a country where the military plays an active and central role in both politics and economic affairs. On the other end of the spectrum, Singapore and Hong Kong are among the economies with the highest inward FDI/GDP ratios in the world, apart from some tax havens such as the Bahamas, or the Cayman Islands.

Table 7. Outward FDI as a percentage of GDP.

	1986	1990	1995	2000	2005	2010	2015	2020
Brunei	0	0	4	7	5	13	22	23
Cambodia	0	0	8	5	4	3	3	4
China	0	1	2	2	3	5	10	16
Indonesia	0	0	0	0	1	3	5	9
Japan	3	6	4	6	8	15	29	39
Korea	2	2	2	4	4	13	20	31
Laos	0	0	0	1	1	1	1	0
Malaysia	5	5	9	16	17	43	51	45
Myanmar	0	0	0	0	0	0	0	0
Philippines	1	1	1	2	2	9	14	18
Singapore	13	20	40	59	150	195	240	359
Thailand	0	0	1	3	3	7	19	34
Vietnam	0	0	0	0	0	2	3	3
Taiwan	1	14	15	20	28	43	57	60
Hong Kong	32	57	112	254	303	454	552	598
China, HK, Macao	4	77	62	33	25	22	25	30

Source: Calculations based on data from Lane & Milesi-Ferretti (2018)

The patterns of outward FDI show steady growth for most East Asian economies as well, albeit the scale of outward financial activity is limited for most states compared to the inward numbers. Naturally, outward FDI is minimal in the case of the least developed countries of the region, and exceedingly high in financial centres such as Singapore, and Hong Kong.

Other forms of cross-border capital are less substantial in East Asian transnational transactions. According to calculations based on the data Lane & Milesi-Ferretti (2018), the value of portfolio debt instruments as a share of GDP is close to zero apart from the financial centers of the region. But even in Singapore, Hong Kong, and Macao, the share of cross-border lending in GDP remains under ten percent. The holding of foreign equities, as well as the foreign holding of domestically issued equities is more remarkable, although the gulf between the less financially developed and the more financialized economies in the region is obviously sizable.

Apart from Singapore, foreign equities assets as a share of GDP reached 100 percent in Japan, Taiwan, and Brunei by 2020. Entities in South Korea, and Malaysia possess larger holdings in foreign firms as well. Inward equity investment is more equally

divided among regional economies, at least a share of GDP. Apart from Myanmar, Brunei, Cambodia, and Vietnam each country has sizeable foreign ownership, albeit the spectrum of the GDP share of equity liabilities varies greatly, with Taiwan, Japan, Korea, and Hong Kong being well above average.

Table 8. Equity assets and liabilities as a share of GDP.

	Outward				Inward			
	1996	2000	2010	2020	1996	2000	2010	2020
Brunei	200	267	158	337	0	0	0	0
Cambodia	0	5	4	3	0	1	2	3
China	3	6	5	6	3	2	8	13
Indonesia	0	1	1	3	6	7	19	25
Japan	20	27	58	100	12	18	33	81
Korea	2	1	10	43	10	14	43	60
Laos	0	0	0	0	0	0	1	20
Malaysia	1	2	14	38	30	16	50	47
Myanmar	0	0	0	0	0	0	0	1
Philippines	1	5	5	9	23	20	26	25
Singapore	71	201	246	465	21	55	66	77
Thailand	0	0	7	16	14	13	25	27
Vietnam	0	0	0	0	0	2	7	7
Taiwan	6	9	68	168	6	9	57	102
Hong Kong	87	104	407	637	35	89	181	158
China, HK, Macao	50	18	20	22	21	13	14	17

Source: Calculations based on data from Lane & Milesi-Ferretti (2018)

Albeit Chapter 4 deals in more detail with the relative financial weights of regional economies, it is worth noting here that although China's foreign lending and investment activities show a remarkable increase, compared to the size of its economy, as well as to the global financial footprint of major developed countries, its financial clout remains severely limited as of 2020.

2.5.4 Measuring value-added and GVC participation

In contrast to the previous section, which deals with gross trade values and disaggregated trade data by product codes to identify production links through trade flows of intermediary products, an emerging approach of GVC research uses other tools to give a more detailed picture of production linkages between economies.

As noted in the introduction, in a world of GVCs, gross trade values do not necessarily represent the real value of economic exchange between two countries, as a large part of export values are made up of imported inputs. This results in numerous problems for entangling trade relationships among states. One of these is that the trade values overstate the 'real' level of economic interdependence among actors by inflating

the export values. Another such problem is that gross trade presents an insufficient picture of bilateral vulnerabilities, since in GVCs inputs from third countries might be crucial for the production of essential goods.

The new strand of research aimed at eliminating these problems is based on the harmonization of national input–output (IO) databases. National IO databases capture the final and intermediate demand for each sector’s output, meaning the part of that output that is consumed, and used by downstream industries in the production of other goods. As such tables contain all such transactions for the whole economy, it becomes possible to discern how much value each sector adds to other sectors production, as well as to final demand.

The international harmonization of IO takes account of international transactions as well, thus makes it possible to disentangle the use and supply of intermediary inputs among foreign sectors and economies. (Shepherd B. , 2020, p. 1). Over the past decade, such harmonization efforts have yielded a number of different inter-country (ICIO), or multi-regional input–output tables (MRIO). The basic layout of such an ICIO table is shown in Figure 7.

Figure 4. An example of an international IO table.

		Outputs				Final Demand				Total Output
		1	2	...	G	1	2	...	G	
Inputs	1	Z_{11}	Z_{12}	...	Z_{1G}	Y_{11}	Y_{12}	...	Y_{1G}	X_1
	2	Z_{21}		...	Z_{2G}	Y_{21}		...	Y_{2G}	X_2
	$\vdots$	$\vdots$	$\vdots$	$\ddots$	$\vdots$	$\vdots$	$\vdots$	$\ddots$	$\vdots$	$\vdots$
	G	Z_{G1}	Z_{G2}	...	Z_{GG}	Y_{G1}	Y_{G2}	...	Y_{GG}	X_G
Value Added		VA_1	VA_2	...	VA_G					
Total Output		$(X_1)'$	$(X_2)'$	...	$(X_G)'$					

Source: (Belotti, Borin, & Mancini, 2020, p. 37)

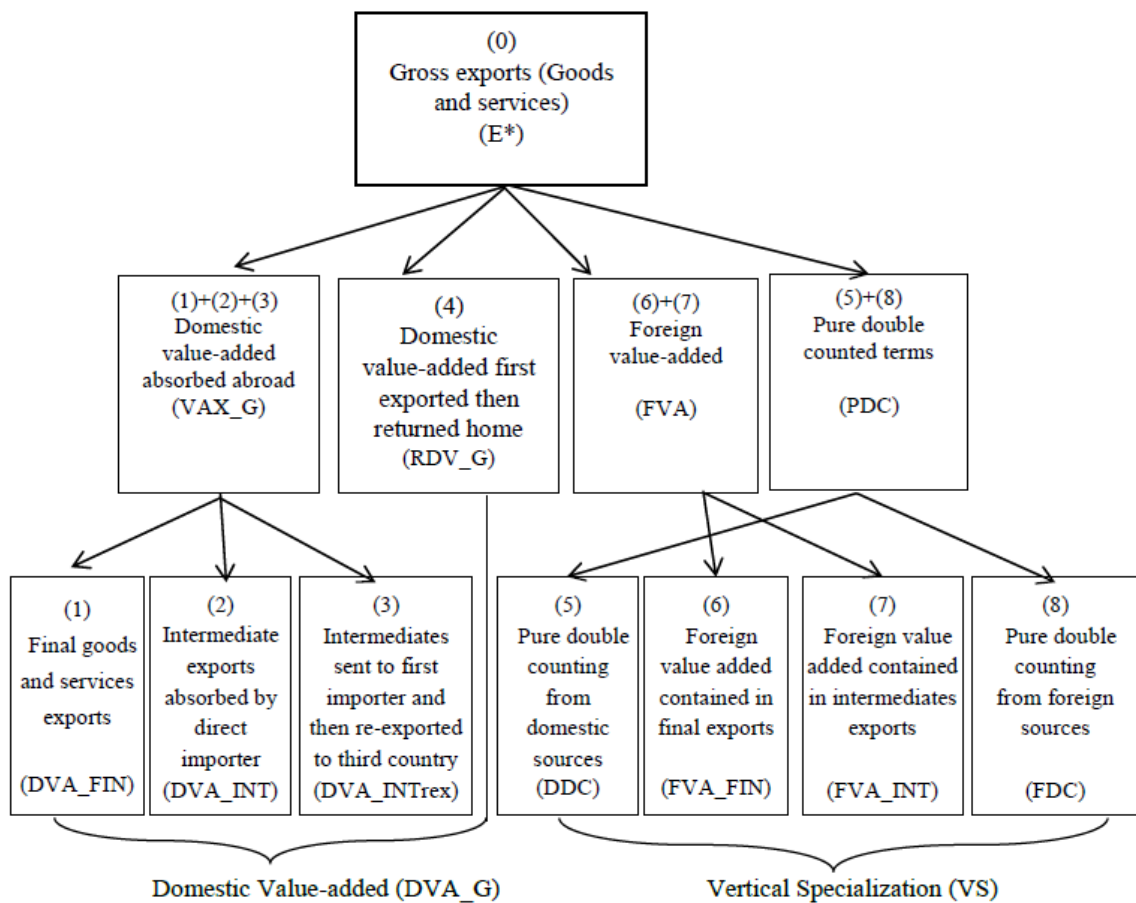
Such tables then make it possible to decompose sectoral value-added among different sectors in different countries. Following Antrás & Chor (2021, pp. 5–6), the gross output of a given country-industry Y_i^r can be expressed as the sum of the value that is absorbed in final-use and purchased for use as an input.

The combination of IO tables and trade data also makes it possible to decompose gross trade at the sector, bilateral, or bilateral-sector level, into the sum of various value added and double counted components (Wang, Wei, & Zhu, 2013, p. 2). While there are

various methods to do so, for the sake of comparability and simplicity, I will use here the two most widely used methods.

The first of these decomposed international input-output and trade data into sixteen different measures, as shown in the following figure. This decomposition made is possible to discern how value is produced and trade in different country-industries (Wang, Wei, & Zhu, 2013; Wang, Wei, Yu, & Zhu, 2017).

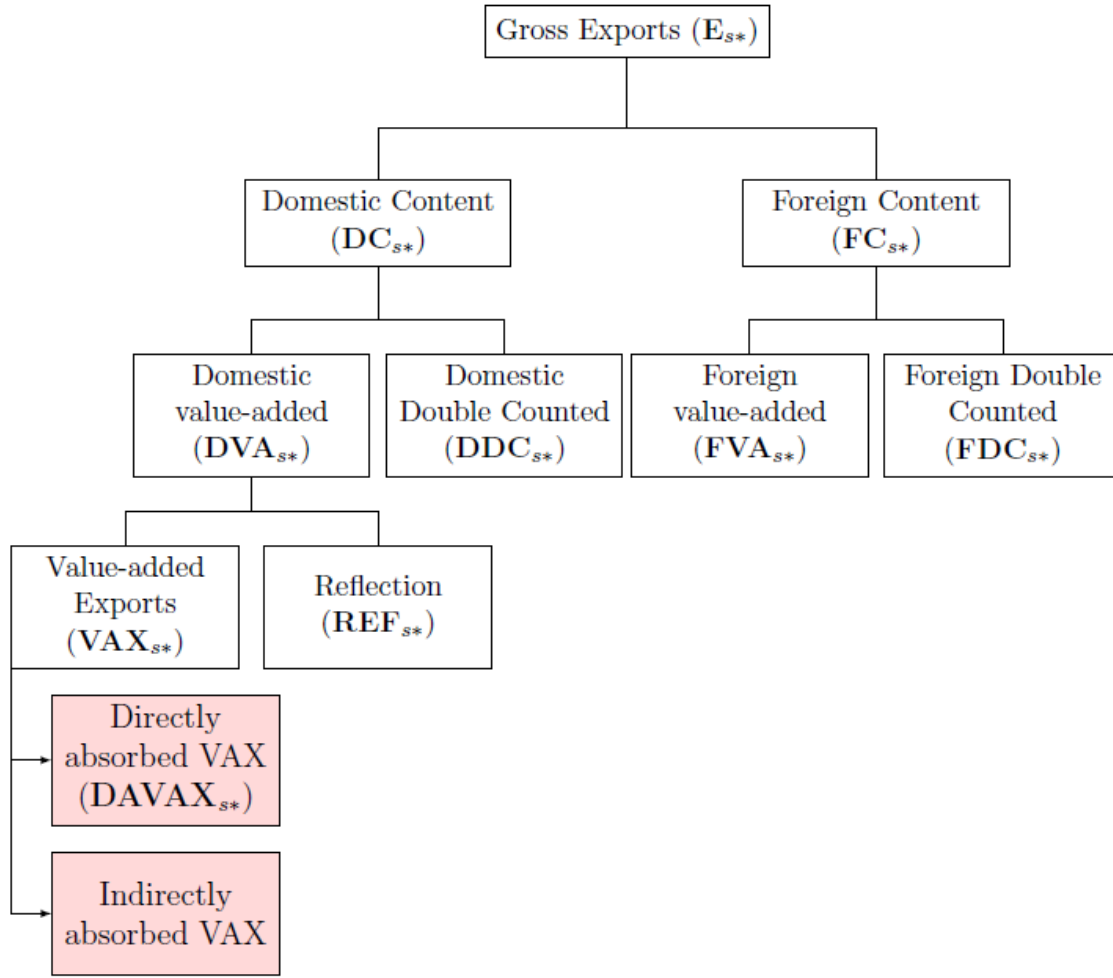
Figure 5. The Wang–Wei–Zhu decomposition.



Source: Wang, Wei, & Zhu (2013, p. 17)

Another method of decomposition and GVC participation were produced by (Borin & Mancini, 2019), who aimed to decompose global GVC-related trade into even finer categories and multiple accounting perspectives. The components of this decomposition are presented in the following figure.

Figure 6. The decomposition of Borin & Mancini.



Source: Belotti, Borin, & Mancini (2020, p. 41).

This methodology discerns GVC-related trade on the global, bilateral and the sectoral level.²⁹ In this setting, as detailed by Belotti, Borin, & Mancini (2020, pp. 52–53), the GVC-related trade is defined from the directly absorbed value-added in exports, which is computed for exports of country s to country r as the following:

$$\text{DAVAX}_{sr} = \mathbf{V}_s(\mathbf{I} - \mathbf{A}_{ss})^{-1}\mathbf{Y}_{sr} + \mathbf{V}_s(\mathbf{I} - \mathbf{A}_{ss})^{-1}\mathbf{A}_{sr}(\mathbf{I} - \mathbf{A}_{rr})^{-1}\mathbf{Y}_{rr}.$$

From this equation, GVC-related exports can be obtained by excluding domestic value added of country s absorbed directly by its direct importer from its exports to r :

$$\text{GVCX}_{sr} = \mathbf{u}_N \mathbf{E}_{sr} - \text{DAVAX}_{sr}.$$

²⁹ For brevity, the background of their calculations is repeated here in a condensed form. The reader is advised to consult (Borin & Mancini, 2019) for the detailed explanation.

From this, GVC-related trade share in total exports is:

$$GVC_{sr} = \frac{GVCX_{sr}}{u_N E_{sr}},$$

Where the denominator is the total exports of country s to country r . For the total exports of country s , the GVC share can then be computed as:

$$GVC_s = \frac{\sum_{r \neq s}^G GVCX_{sr}}{u_N E_{s*}},$$

Furthermore, this indicator can be decomposed to discern backward and forward GVC participation. Backward participation refers to the value-added of inputs imported to produce intermediate or final goods to be exported. Forward participation refers to the part of domestic production that is supplied by the exporter to the importing country to be re-exported.

In more simple terms, backward participation means that a country-industry imports inputs to produce exports, while forward participation means that a country-industry supplies other country-industries with inputs for their export production.

The backward participation can be computed as:

$$GVCbackward_{sr} = \frac{V_s(I - A_{ss})^{-1} \sum_{j \neq s}^G A_{sj} B_{js} E_{sr} + \sum_{t \neq s}^G V_t B_{ts} E_{sr}}{u_N E_{sr}}$$

While the forward participation takes the form as:

$$GVCforward_{sr} = \frac{V_s(I - A_{ss})^{-1} A_{sr} (I - A_{rr})^{-1} (\sum_{j \neq r}^G Y_{rj} + \sum_{j \neq r}^G A_{rj} \sum_k^G \sum_l^G B_{jk} Y_{kl})}{u_N E_{sr}}.$$

Moreover, a country-industry's GVC position can be discerned as the difference between its forward and backward participation rate. A negative value would suggest that the country-industry relies more on foreign inputs for its production, while a positive value suggests that that country-industry provides inputs for other country-industries.

In this sense, the GVC position can offer a measure of production interdependence, although a rather crude one: a positive value in the case of a developing country might mean that said country is specializing in the upstream segment, which—

depending on the industry—might mean specializing in lower value-added. For example, as explored in later chapters, China is a dominant player in many upstream segments in high-tech GVCs, such as rare earth mining and refining or the production of active ingredients for pharmaceuticals. In this case, a positive value for China means, on the one hand, that the world is reliant on China for upstream products. On the other hand, it also means that China specializes in the labour-intensive, low-skilled parts of the value chain, hence it is reliant on foreign value-added for final consumption of pharmaceuticals and electronics produced using rare earth minerals.³⁰

As the previous example suggests, while IO-based analysis is a useful alternative to trade values, it has its own shortcomings. One of these is that international IO data is aggregated at the sectoral level, thus product-level disaggregation cannot be achieved. This limits the scope of IO analysis for the study of deeper vulnerabilities and chokepoints in GVCs. A second shortcoming is that the data involved in IO analysis are not perfect since they are often estimated through modelling. Hence while IO data is useful for mapping production patterns and the spread of GVC activities, it is far from a magic bullet which makes GVC interdependence totally transparent. Third, IO data is computed on a basis of current prices, meaning that the potential for time-series comparison of IO data is limited through the effects of price changes. For this reason, most of the time series comparisons in this study will be calculated on the basis of shares instead of absolute values, both in the following sections, and in Chapter 4 as well.

In summary, the practical usability of IO analysis has its limits, especially if the aim is to unearth deeper political economy relations. That being said, this new methodology provides a more accurate picture of the value of economic exchange among states, as well as their production dependencies, as detailed in the following sections.

2.5.5 Trade in value-added

One important way in which the decompositions presented in the previous section can be utilized is the dissection of value-added in trade flows. As noted in the introduction, value-added has become an increasingly scrutinized concept in recent years due to the expansion of GVCs and the fragmentation of production stages across borders. This means that gross trade values do not necessarily represent the underlying value of

³⁰ Another way to calculate dependence among country-industries is to use the so-called Leontief and Ghosh inverse matrices, which will be used in the later chapters to discern interdependence in GVCs more precisely.

economic exchange between economies, since intermediate and final products are counted at their total value at the customs, even though they usually contain substantial foreign value-added through imported inputs.

One example is the trading relationship between the ASEAN and China. Using the ADB MRIO for the year 2019, ASEAN gross exports to China total US\$146.6 billion.³¹ From this, the domestic value-added of the exports was US\$94.3 billion. Out of this, the value of the domestic content of ASEAN directly absorbed in China was US\$77.7 billion, while 16.6 million of ASEAN domestic content was re-exported from China. Nevertheless, China exported ASEAN value-added from third countries as well, bringing the total value-added of ASEAN in Chinese imports to US\$121 billion, a 17.5 percent decrease compared to the gross trade values. The difference is even larger in the other direction. China's gross exports to ASEAN were US\$212 billion USD, while the Chinese domestic content was 184 billion. However, out of this, only US\$122 billion was directly absorbed in the ASEAN, the rest was re-exported. Even when counting Chinese value-added imported from third countries, the ASEAN imported only US\$144 billion of Chinese domestic content, which is a 32 percent decrease compared to the gross trade values.

GVC related trade amounted to 42 percent of Chinese exports to the ASEAN, while 47 percent for ASEAN's exports to China. As evidenced from the aforementioned data, Chinese exports to the ASEAN were largely in the forward direction, while ASEAN exports to China were predominantly backwards. There are of course more than one way to look at this data. One would be to assert that the 'real' economic relationship between ASEAN and China is much weaker than the gross trade values show. Another one would be to conclude that China is an incredibly important source of intermediary inputs for the ASEAN countries, which on the one hand is a testament to the development of Chinese parts and components manufacturers, on the other hand exposes China to potential third-country risks transmitted through ASEAN. A third interpretation of the data, from the perspective of the international political economy of East Asian regionalization would lead to the conclusion that the China–ASEAN economic relationship is an outward-facing one, meaning that these countries predominantly collaborate in the manufacturing of products which will be re-exported to third countries.

³¹ The data for ASEAN does not include Myanmar, since there is no data for the country in the ADB MRIO.

There are other lessons from the data with regards to the US. First, in the case of China–US trade, the difference between the Chinese domestic content imported by the United States from all countries is not significantly larger than the gross imports from China. This means that although there are quite a few pieces of analysis stating that the Chinese trade reliance on the US is weaker than what gross trade data shows, the difference between the gross trade values and the Chinese domestic content of direct trade is largely made up through Chinese value-added imported to the US from third countries. Second, in the case of the ASEAN, however, the gap between gross exports and total value added imported to the US from the ASEAN is much smaller than in the China–ASEAN relationship, meaning that the importance of the US market relative to the Chinese for ASEAN goods is understated in gross trade data.

Table 9. ASEAN exports to China and the US, and Chinese exports to the US as a share of exporter GDP, computed on a value-added and gross basis.

	ASEAN to China			ASEAN to US			China to US		
	VA	Gross	Diff.	VA	Gross	Diff.	VA	Gross	Diff.
2010	2,8	3,7	-0,9	3,6	3,9	-0,3	4,0	4,4	-0,3
2011	3,1	4,2	-1,1	3,3	3,5	-0,2	3,6	3,9	-0,3
2012	3,4	5,1	-1,6	3,2	3,7	-0,5	3,5	3,7	-0,2
2013	3,3	4,7	-1,3	3,1	3,6	-0,5	3,2	3,4	-0,2
2014	2,8	4,0	-1,1	3,1	3,6	-0,5	3,1	3,3	-0,2
2015	2,7	3,4	-0,7	3,1	3,5	-0,4	3,1	3,2	-0,1
2016	2,7	3,6	-1,0	3,2	3,8	-0,6	3,0	3,1	-0,1
2017	2,9	4,1	-1,2	3,3	3,9	-0,6	2,9	3,0	0,0
2018	4,1	5,0	-0,9	3,7	3,7	0,0	3,3	3,3	-0,1
2019	3,9	4,8	-0,8	3,5	4,0	-0,5	3,2	3,3	-0,1

Source: Own calculations based on the ADB MRIO and the methodology of Wang, Wei, & Zhu (2013).

2.5.6 Patterns of GVC participation in East Asia

As noted in the introduction, East Asia is often described as ‘Factory Asia’ and an export powerhouse by analysts and international organizations. This is mostly a reflection of the emergence of regional production networks and expanding GVC activities in the region. In this section, I present a number of indicators measuring GVC participation in East Asia to evaluate the strength and growth of production networking. This section provides a descriptive overview of relatively simple indicators, whereas Chapter 4 will look at more complex data to make inferences regarding the power relationships within East Asian production networks.

2.5.6.1 *GVC participation*

First, I look at the GVC participation rate of regional economies based on the methodology of Belotti, Borin, & Mancini (2020) with data from the ADB MRIO. The following table shows the share of GVC-related trade related to gross trade for each East Asian country for which data is present in the ADB MRIO. Additionally, a number of extra-regional countries representative of broader global trends are included so as to highlight some similarities and differences between East Asian and extra-regional developments.³²

The table clearly demonstrates that, as noted earlier, an increasing part of global trade is GVC-based, and GVC-trade represents the majority of trade volume for most of East Asian economies. However, the table also shows that there are considerable differences among East Asian nations, as well as between the East Asian GVC participation rates and European GVC participation rates based on trade shares.

First, the two largest economies in East Asia, China, and Japan are among the least integrated into the GVCs relative to the rest of the region based on this measure, which may be unexpected given that these countries play a central role in regional trade networks and production sharing.

Second, it is clear that the economies formerly referred to as the NIEs, which are now high-income, high-technology producers, owe their development to their deep embeddedness into international production: Singapore, South Korea and Taiwan have some of the highest shares of GVC-related trade in East Asia. A similar GVC-based development pattern is clear in the case of the third wave of industrializers, namely Thailand, Malaysia, and the Philippines. However, it is clear that most of these countries are moving away from overreliance on GVCs: the GVC exposure of Singapore, Thailand, and Malaysia has reduced significantly since 2000, albeit the GVC trade share remains high for each of these economies. On the other hand, the least developed countries of the region, Cambodia and Vietnam went from low participation rates to above 50 percent since 2000.

GVC participation can be measures both based on trade and based on output. In contrasts to the trade-based measure, output-based GVC participation means computing the share of GVC-related output in total output. Naturally, such a measure yields

³² Data is only presented for select years for the ease of reading. GVC participation rates do not change dramatically from year-to-year, which means that presenting a limited subset of the data does not alter the message of the table.

generally lower participation rates, since in most countries output is mostly consumed domestically.

Table 10. GVC participation rates in East Asia and beyond.

Exporter	2000	2007	2011	2015	2019	2020
Cambodia	37,17	40,07	37,27	38,99	43,42	50,03
India	30,91	38,99	38,27	35,20	36,13	33,44
Indonesia	37,12	39,42	41,92	38,28	36,16	34,96
Japan	30,50	37,89	39,94	39,64	36,16	34,39
Malaysia	67,28	64,43	60,72	57,53	54,90	55,33
China	30,79	37,09	36,06	30,83	33,93	32,22
Philippines	43,09	53,14	41,99	40,45	47,13	45,36
Singapore	66,76	65,40	68,68	64,06	59,93	58,00
South Korea	45,75	49,15	55,32	51,56	50,56	48,61
Taiwan	53,04	62,79	63,15	57,41	57,46	53,81
Thailand	43,66	52,74	49,86	43,38	43,09	41,73
Viet Nam	36,65	46,14	55,06	50,67	58,83	56,70
Brazil	30,83	33,90	43,81	35,68	35,86	36,85
Czechia	49,48	59,52	62,06	66,15	61,33	58,75
France	40,41	44,36	47,35	46,63	49,16	48,07
Germany	40,61	45,16	47,38	47,34	52,43	49,33
Netherlands	44,66	48,94	58,85	58,70	59,36	58,90
USA	36,04	36,65	37,74	36,83	37,72	36,99
United Kingdom	37,89	41,33	44,75	41,60	45,35	44,32

Source: Calculations based on the ADB MRIO and the methodology of Belotti, Borin, & Mancin (2020).

The following table shows the output-based GVC participation for the same group of countries. On a production basis, GVC integration shows somewhat different patterns than on a trade basis. Even though GVC trade represents the majority of trade even for some large, developed economies like France and Germany, it is much more limited on an output-basis. In the case of the large East Asian economies, the output-based values are below 10 percent for each of these, which is a reflection of the generally secondary role trade plays in countries with a large domestic market. From this perspective, an output-based measure is a better reflection of the relative importance of GVC participation for a given economy.

Nevertheless, some patterns are similar between the two measurement methodologies. The increased GVC integration of developing Southeast Asian nations is pronounced even in the output data, and the values for Cambodia and Vietnam show that GVC-participation is indeed the dominant development strategy in the region.

Table 11. GVC-related output as a share of total output.

	2000	2007	2011	2015	2019	2020
Cambodia	15,57	18,63	15,19	17,34	23,23	29,42
India	5,88	9,43	9,04	7,17	8,89	8,13
Indonesia	13,76	12,02	11,91	9,47	7,83	6,98
Japan	4,77	9,15	8,73	9,55	8,02	7,01
Laos	12,73	11,35	14,29	14,18	17,15	14,67
Malaysia	42,29	39,87	33,82	28,22	26,62	25,24
China	8,48	14,42	11,85	8,44	8,30	7,61
Philippines	13,15	19,63	11,56	10,65	11,41	10,05
Singapore	42,78	47,14	49,50	42,81	42,95	41,69
South Korea	16,17	19,02	25,71	23,81	19,49	17,79
Taiwan	23,21	34,60	35,77	31,74	30,89	27,85
Thailand	19,14	23,36	23,40	21,49	22,93	20,28
Viet Nam	19,28	27,29	32,95	29,41	37,21	34,52
Brazil	4,75	6,66	8,95	6,52	7,09	8,29
Czech Republic	19,90	27,76	30,48	36,50	34,67	32,36
France	11,54	12,57	14,05	14,29	16,80	15,14
Germany	13,24	18,72	19,72	20,43	22,35	20,58
Netherlands	19,20	21,41	27,70	31,41	38,21	36,84
USA	4,61	5,24	5,88	5,15	5,78	4,97
United Kingdom	10,25	11,31	14,09	12,13	15,04	13,18

Source: Calculations based on the ADB MRIO and the methodology of Belotti, Borin, & Mancin (2020).

Similarly, the former NIEs retain their openness and integration into the world economy even after reaching the high-income threshold. Among the third wave industrializers, the importance of GVC participation is decreasing, just as in the case of the trade-based values. This is especially true for Malaysia, which went from one of the most GVC-intensive economies in 2000 to a moderate share of GVC-based output by 2020.

2.5.6.2 Sectoral patterns of GVC participation

Naturally, there are very considerable differences in GVC participation between different sectors of the economy. While nowadays GVC operate in almost all sectors, from primary products to complex services, most GVC activities are concentrated in manufacturing, especially in the electronics industry, whereas production sharing in

agriculture is much less widespread. The following table shows a sectoral breakdown of GVC output in East Asian economies by sector.

Table 12. GVC-related output as a share of total output by sector of the economy in 2019.

	Brunei	Cambodia	Indonesia	Japan	Laos	Malaysia	China	Philippines	Singapore	Korea	Taiwan	Thailand	Vietnam
Agriculture	7	15	5	4	18	17	4	4	33	8	9	17	32
Food ind.	20	23	6	4	15	20	4	4	34	10	12	20	29
Textiles	10	45	31	15	24	34	13	13	44	28	49	28	52
Mining	41	14	16	15	27	33	9	20	n.a.	30	33	33	38
Metals	65	67	24	25	70	50	16	33	61	40	50	36	69
Chemicals	55	27	19	27	51	43	11	14	62	41	60	58	54
Vehicles	39	41	12	19	44	26	10	17	54	29	37	33	63
Electronics	26	53	20	26	36	70	22	57	60	40	59	53	74
Misc. Manufacturing	24	44	13	11	35	25	13	12	39	26	42	36	48
Construction	14	10	3	3	21	12	3	6	10	6	11	14	17
Electricity, gas, water	20	27	10	9	33	20	9	10	37	21	35	20	14
Finance	9	4	4	4	3	14	4	4	37	7	9	12	16
Telecom	19	14	5	4	6	13	5	11	38	9	10	14	19
Real estate	2	7	2	1	2	12	2	4	13	3	3	5	10
Misc. Services	7	8	4	2	6	11	5	10	7	8	9	11	12

Source: Calculations based on the ADB MRIO and the methodology of Belotti, Borin, & Mancin (2020).

It is clear from the data that metal and chemical production, and most manufacturing industries such as vehicle, electronics, machinery manufacturing is very GVC-intensive in most East Asian countries. There are some notable exceptions, however. In China, just as in the case of total output, the GVC share of output is meagre even in most manufacturing industries apart from electronics. For Japan, the share is somewhat higher, but remains under 30 percent even in the most GVC-intensive sectors. The situation is markedly different in the third large regional economy, South Korea, which is considerably more reliant on GVCs in most industrial sectors.

There are substantial differences among ASEAN economies as well. Indonesia is barely involved in GVCs, and its most GVC-reliant industries are producing less complex goods, such as textiles and metals. Most GVC activities in the Philippines are concentrated in the electronics manufacturing industry and metal production, whereas other sectors as not very internationalized.

In Vietnam and Cambodia, most industrial activities are mostly GVC-reliant, showing that in the least developed economies of the region, attracting FDI and integrating into the regional and global networks of production remains the dominant path of development. Yet the same is true on the other end of the development spectrum: Singapore, which boasts by far the highest per capita GDP in the region, is heavily GVC-

dependent, and is unique among the regional economies in that its services sectors are mostly internationalized. The same holds true for Taiwan, another high-income economy. Thailand and Malaysia represent a middle ground, with high, but not extremely high penetration of GVCs.

It is noteworthy that the services sector in East Asia is so far not heavily involved in GVCs, in spite of the aforementioned servicification of manufacturing. This is a marked difference from Europe, where sectors such as financial services, telecommunications, and even utilities are much more involved within GVCs. This shows that there are large gains in welfare and efficiency to be had from services liberalization—but also that there are powerful domestic vested interests in keeping the services sector guarded from foreign competition.

2.5.6.3 Changes in GVC participation

A somewhat surprising finding is that while East Asia's global trade share and GDP share has increased substantially during the past decades, the rate of GVC participation did not change significantly since the 2008–2009 financial crisis.

As for trade-based GVC participation, the GVC share has decreased for nine out of thirteen economies between 2007 and 2019.³³ As for output-based GVC participation rate, there are six economies where the rate of participation declined, there are three economies which experienced a measurable increase, while the output share remained unchanged between 2007 and 2019 for a further three countries. The other seven economies have experienced a shrinking GVS output rate in these years.

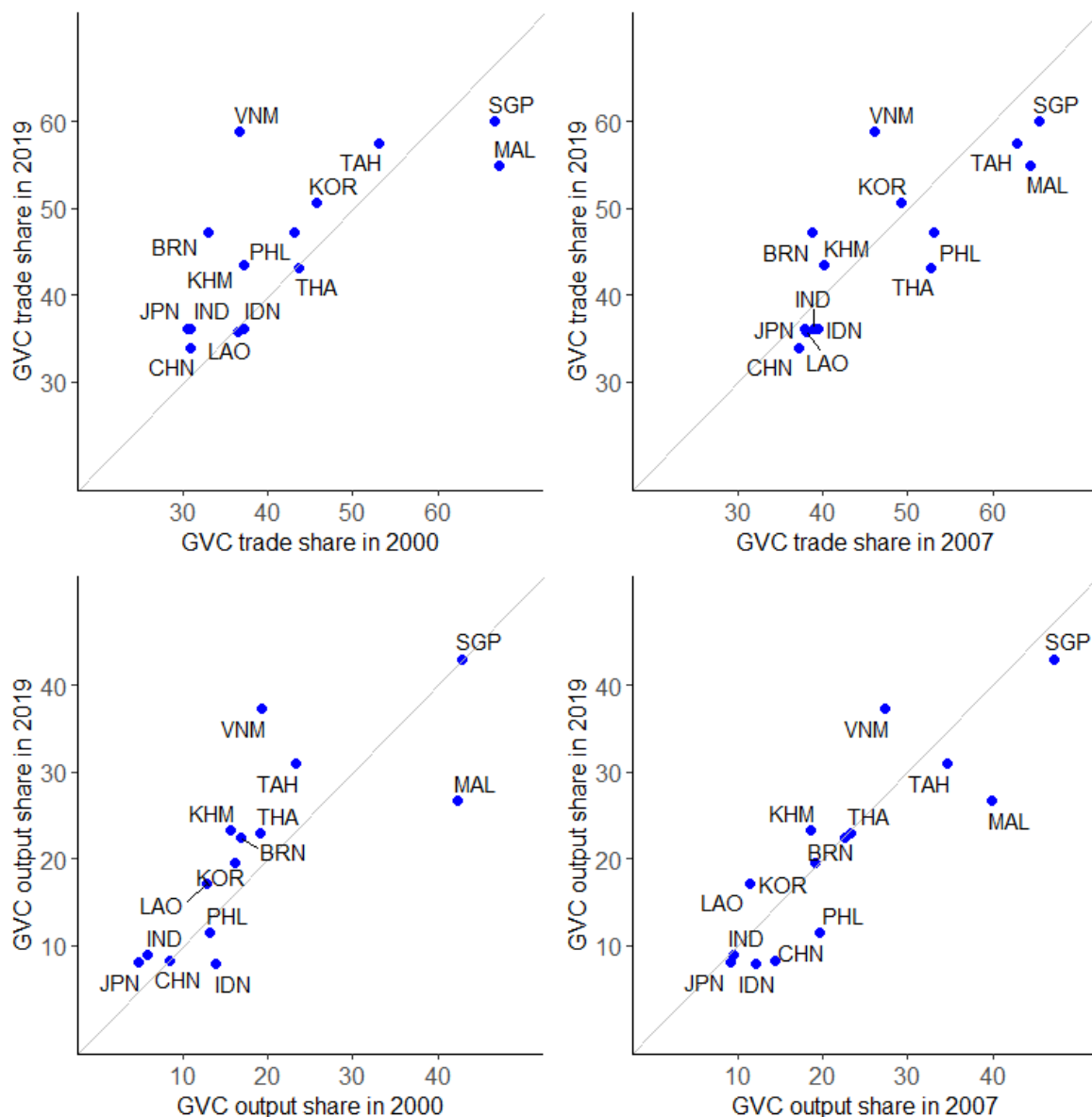
Naturally, the picture is different when comparing the GVC share between 2000—the first year presently available in the ADB MRIO—and 2019. GVC trade share decreased for only two countries, Singapore, and Malaysia, which had exceedingly high GVC trade shares in 2000. The value remained unchanged for Laos, Indonesia, and Thailand, suggesting that the integration of these countries into GVCs has stalled.

On the output side, Singapore, the Philippines, and China experienced stagnating numbers since 2000. In the case of Singapore, this is a result of the increasing GVC participation in services: while the relative importance of GVC trade has declined somewhat, due to the servicification of GVCs and Singapore's special status as an international services hub for Southeast Asia and East Asia, the output share remained

³³ There was no data available for Myanmar in the ADB MRIO for these years and variables.

unchanged. In China's case, the number is a reflection of the fact that even though trade values had expanded rapidly after WTO accession in 2001, domestic output has outpaced trade growth in recent years.

Figure 7. Changes in the GVC share of trade and output in East Asian economies.



Source: Calculations based on the ADB MRIO and the methodology of Belotti, Borin, & Mancin (2020).

As for Malaysia, Indonesia, and the Philippines, the GVC output shares show a negative change from 2000 to 2019. For Malaysia, the explanation is the same as for trade data, for it had an uncharacteristically high share value in 2000. For Indonesia, and the Philippines, integration is lagging.

In summary, while GVC penetration in East Asia is considerable, the slow trade of the 2008–2009 financial crisis and the slowbalization of the 2010s led to the taming of GVC expansion as a share of total trade and total output.

3 The determinants of trade and GVC participation in East Asia

After the descriptive overview of the development of the East Asian regional economic system, this section will deal with the analysis of the data presented in the previous chapter.

In this chapter, I turn to investigate the first research question, namely: *on which level of analysis are the main determinants of regional trade, and production network development located in East Asia?*

As detailed in the introduction, I treat economic interdependence as the result of complex structural forces and policies on multiple levels of analysis. The next section will lay out the conceptualization of the exact variables this entails, while the rest of the chapter will contain two regression models aimed at analyzing the effects of these variables on regional economic relations.

While the first section looks at the determinants of trade, the second section of the chapter will investigate the determinants of GVC participation for East Asian economies. The analysis makes use of recent methodological advances in economics to discern how states are able to influence the regional production architecture.

3.1 Conceptualizing the variable selection

3.1.1 The fragmentation of production

As described by fragmentation and agglomeration industrial production in East Asia, especially in the machinery industry, and within the machinery industry particularly in the auto industry and the electronics manufacturing sector, has been concentrating into region-wide, multi-country production networks (Kimura & Ando, 2005).

In these networks, geographic fragmentation and agglomeration go hand in hand. This means that on the one hand, the production process of a good is in itself fragmented: different stages of production take place in different geographical locations. For example, the components of the Apple iPhone smartphone, which is assembled in China, are sourced from various regional countries, including Japan, Taiwan, Korea and Southeast Asia, and part and components of the final products are exported and imported between countries. In fact, an increasingly important feature of fragmentation that the parts and

components (or in other words, intermediary inputs) are themselves made up of internationally sources subparts and subcomponents.

Additionally, as a result of the economies of scale of location advantages, the fragmented blocs of production are agglomerated in regional industrial clusters. This means that even though the production process of one particular good is fragmented in itself, the industries involved in the production of certain subsectors tend to agglomerate in certain geographical locations, industrial zones. Thus, the forces of fragmentation and agglomeration are countervailing at the firm level, but at the industry/aggregate level, fragmentation and agglomeration may go together.

This process can be captured through the rapid expansion of (mostly) vertically differentiated intra-industry trade (IIT), which is concentrated mostly in machinery parts and components trade, especially auto parts and electronics. East Asian production networks are much more complex and involve more countries than in other parts of the world. They are also more durable: even though overall trade values shrank dramatically during the 2008–2009 financial and economic crisis, East Asian parts and components trade survived this largely unscathed and have rebounded since (Okubo, Kimura, & Teshima, 2014).

The theoretic and practical relevance of the fragmentation and agglomeration theory in explaining the logic and nature of East Asian regionalisation, and as such its value for supplementing this study, will be explored further in the next chapter and chapter four. Suffice it to say here that these research results show a number of peculiarities about East Asian regionalisation and development.

First, they show that the nature of interdependence in East Asia is more tightly knit on a regional scale than in other parts of the world: the smooth operation of ‘Factory Asia’ rests on the operation of multi-country and (in terms of product differentiation) multi-level networks of production which tie together a large number of regional states and industries. Second, when explained in more detail, they show how East Asian market forces have been reacting to certain sets of incentives supplied by domestic, regional and global institutions. This will be discussed further.

3.1.2 FTAs

Perhaps the most consequential contemporary intellectual debate with regards to the topic of this dissertation concerns the one on the utility of regional free trade agreements. Although the literature uses various definitions for these agreements, such

as Preferential Trade Agreements (PTA), Regional Trade Agreements (RTA), Economic Partnership Agreements (EPA), and these different classifications mean different types of treaties, for brevity I will stick to the most commonly used term, Free Trade Agreement (FTA).

As noted earlier, neoliberal strands of IR hold that institutions solve the collective action dilemmas involve in economic integration and reduce the transaction costs associated with such dilemmas. The political economy approach and economics instead evaluate institutions, and among them, FTAs on the basis of cost-benefit analysis of the individual actors involved.

3.1.2.1 The economic rationale for FTAs

Since the discipline of economics concerns itself predominantly with efficiency and welfare, the focal point of the economics approach has been the relative and absolute welfare effects of trade and trade agreements. In addition, economics focuses on the design of the institutions from a mostly utilitarian perspective, rather than the aforementioned, ideational or power-based explanations of International Relations. Nevertheless, this does not mean that factors other than utility play a role in the calculations in economics; in fact, some of the widely accepted economics theories of FTA-formation analyse the role of the relative differences in power among nations and the inefficiencies resulting from it.

The three core theoretical arguments in economics regarding the purpose of FTAs are the (1) terms of trade theory; (2) the domestic commitment theory; (3) and the New Trade Theory, which was discussed briefly above.

Among these, the first one bears the most resemblance to the traditional International Relations understanding of institutional formation; which is largely the result of the fact that International Relations theory itself was substantially informed by economics theory in the time period when neoliberal institutionalism was born.

Terms of trade theory holds that the main purpose of states' national trade policies is to improve their terms of trade in international trade and thus maximize their national income. In this environment, the traditional prisoner dilemma as explained in the beginning of this chapter arises: competition leads to sub-optimal results for all and thus decreases welfare. In this situation, trade agreements serve as solutions to the prisoner dilemma by providing a commitment mechanism through which the sources of the non-cooperative Nash equilibrium of terms of trade competition can be eliminated, just as

theorized in institutional approaches of the IR literature (Maggi, 2014). In other words, states' form and/or join FTAs for the benefits of cooperation outweigh those of competition.

The second rationale is akin to the first one inasmuch as it focuses on the commitment element involved in trade agreement formation, and akin to the political economy approach discussed above inasmuch as it focuses on the domestic sources of FTA formation, although from a slightly different angle. Some of the more political economy focused research on the subject hold that FTAs serve as vehicles through which governments "close the door to domestic lobbies." Practical examples include the NAFTA negotiations, where the Mexican government was more interested in making concessions to the United States than protecting its own business lobbies, or China's WTO-accession, where similarly, joining a trade agreement was in essence a tool to 'lock in' domestic reform (Maggi, 2014, pp. 327–328). Slightly similar arguments have been made about recent Japanese FTA-activity, which claim that the government is relying in part on liberalization in its efforts to promote domestic structural reforms which are otherwise hampered by strong lobbies, especially in the agricultural sector (Solís & Urata, 2018). Thus, the difference from the usual political economy model is that in the case of the former, governments are supposed to conduct international negotiations based on lobby pressures, while in the latter, governments conduct international negotiations to alleviate lobby pressures.

The third line of research investigates the implications of imperfect competition for trade agreement formation. This approach is based on the most recent theoretical advances in trade research discussed above, and its novelty lies in that apart from the terms of trade externalities of trade mentioned above, it identified and examined three additional externalities: (i) "firm-delocation" externalities, (ii) "profit-shifting" externalities, and (iii) trade-volume externalities (Maggi, 2014, p. 333)

The first of these can be summarized in non-technical fashion as akin to the informal argument that import protection leads to a loss of manufacturing firms in the exporting country, and the role of a trade agreement is to prevent governments from engaging in generating such negative externalities (Maggi, 2014, p. 334). The second type of externality means that "governments use trade policy not only to improve their terms of trade, but also to shift profits from foreign to domestic firms" (Mrazova, 2011, p. 2). As in the case of the terms of trade argument, trade agreements serve to alleviate the prisoner's dilemma involved in this setting. Nevertheless, Bagwell & Staiger (2012)

argue that even in the presence of delocation or profit-shifting externalities, a trade agreement's sole purpose is still the correction of terms of trade externalities.

While these two aforementioned approaches are based on New Trade Theory, some recent works go further and explore the role of incomplete contracts in trade agreements formation through the lens of "New New Trade Theory." Without analysing the technical details of this approach, its main novelty is that it considers the prices of international transaction as determined not by market clearing but rather by bilateral bargaining, which is the case in many sectors where firms outsource the production of specialized inputs, for example specialized parts and components (Bagwell & Staiger, 2012). In such a setting, the problem of incomplete contracts arises: if the degree of specialization is high and the specialized input is not available on the market, the producer of the specialized input may want to raise its prices or renegotiate the contract, given the importer's reliance on the intermediary input for the production of its own product. Thus, a hold-up problem occurs. If countries were to use income-maximizing tariffs on trade in this setting, beyond the terms of trade externalities, trade policies would affect trade volumes, and a country's trade policies can also affect the severity of the hold-up problem in the other country (Maggi, 2014, p. 339). While this strand of research is in its early stages, and probably too technical to be utilized by mainstream International Relations, it is important to note that in the case of East Asian production networks, especially under the conditions of worsening import protection in 2018 in the United States, such models should be relevant. Some of the implications will be briefly discussed further.

A final economic explanation of FTAs concerns similar issues which are discussed by International Relations: the reduction of uncertainty. Under certain circumstances (when individuals are risk neutral and trade policies exert externalities only through terms of trade), FTA-formation can have an uncertainty-increasing motive. Nevertheless, in the case of risk-averse individuals, trade agreement formation essentially becomes a trade-off between risk aversion and flexibility (Limão & Maggi, 2015). From a practical perspective, which is relevant for the East Asian region where income levels are diverse, the reduction of uncertainty appears to be more important for lower-income countries, meaning that they have more to gain from joining FTAs in terms of the reduction of policy uncertainty. This has been confirmed by recent studies empirically (Baier, Bergstrand, & Clance, 2018).

A further finding is that as trade costs decline, the gains from reducing trade policy uncertainty tend to become more important relative to the gains from reducing

average trade barriers, meaning as the world becomes more integrated, the reduction of uncertainty will become a more important factor in FTA-formation, especially for countries within a region (where trade costs are lower) (Maggi, 2014, pp. 340–341).

3.1.2.2 Trade creation effects of FTAs

Apart from the motivation, the exact economic effects of FTAs are also subject to rich academic discourse. Broadly speaking, the following arguments can be identified in this discourse: (1) FTAs create trade, and are important building blocks of regional integration; (2) East Asian trade agreements are generally ‘soft and weak’, and thus their contributions to regionalism is marginal at best; (3) FTAs in general, and East Asian FTAs in particular are mostly endogenous, meaning they institutionalize existing trade ties; (4) a related argument is that this endogeneity presupposes that considered on the grounds of a narrow economic logic which concerns vertically differentiated intra-industry trade (VIIT), they are indeed important building blocks of regionalism, but their more general (aggregate) trade-creation effects are more subdued; (5) another related argument is that in general, FTAs are not very important determinants of international trade at all, if we measure their effectiveness with the right specifications; (6) and finally, that FTAs are highly heterogenous, meaning that different FTAs will have very different effects on trade values and integration.

What makes the examination of this topic rather complicated, is that all of these positions are based on empirical research based on trade data, and most (but not all) of the differences stem from the methodology employed to interpret that data. The first, tradition position relies on data analysis which shows that tariff reduction through RTAs increases trade among participants (Cipollina & Salvatici, 2010; Hayakawa, Ito, & Kimura, 2016), and as such, represents the most important components of regional integration: they drive regionalization forward by reducing the cost of trade (Watanabe, 2016).

The second argument, mostly popular within International Political Economy but also to a lesser degree in economics, is based mostly on the observation that despite the surge of FTA-creating in East Asia since the early 2000s, the level of interdependence and the share of intra-regional trade have not increased significantly, nor did the structure of the regional production architecture change fundamentally. As such, goes the argument, it is hardly clear that FTAs contribute meaningfully to East Asian regionalization (Baldwin R. E., 2008; Ravenhill, 2010).

A more technical and more general formulation of this argument posits that the studies which assume that FTAs produce large-scale trade creation are not measuring the effects of FTAs correctly. If they did, they would find that the trade creation effects of FTAs are marginal (Rose, 2004; Fontagné & Zignago, 2007). In fact, recent advances in methodology suggest that the measurement of the effect of FTAs or any other explanatory variables of international trade is much more complicated than previously thought. Nevertheless, the methodological advancements did not end the debate, inasmuch as contradictory results have been produced with even the most precise estimation methods. In any case, the argument that FTAs do not significantly promote trade at all is definitely a minority opinion in the literature.

Two relatively new strands of inquiry explore the roles of endogeneity and heterogeneity in FTAs. The first of these wrestles with the question that FTAs themselves are usually already the result of trade and FDI flows, especially on the bilateral level. This means that it is hard to measure their contribution, since the trade ties which they institutionalized were already robust before their inception, suggesting that there are a host of other factors explaining international trade among the participating countries (Baier & Bergstrand, 2007).

This observation goes hand in hand with the fourth argument cited above. The ‘VIIT-argument’ posits that East Asian FTAs mostly institutionalize existing trade ties, and the nature of liberalization follows the ‘path of least resistance.’ Treaties tend to contain mostly provisions which liberalize sectors in which the domestic interests of participating states show complementarity: that is, both participating economies can profit without a need for deeper domestic structural reform. These sectors are usually the ones in which vertically differentiated intra-industry trade is dominant (Manger, 2014). An example could be the trade between Japan and Southeast Asia in electronics parts and components, where there is little competition among participants, as Japan produces mostly high-value parts and components, while Southeast Asian nations produce (mostly through the Japanese companies operating on their territory) mid-value and lower-value components and take part in the assembly of the final product. Such a complementary trading relationship is easy to institutionalize, and most of the FTA activity has been following this premise. Thus, even though their aggregate effects might be disputed, from the sectoral standpoint FTAs are important in investment protection and rule-creation, especially in machinery parts and components trade, where their contribution to trade has been shown to be considerable (Kimura & Obashi, 2011). This has been shown to be true

empirically of some Japanese FTAs (Ando, Urata, & Yamanouchi, 2019; Yamanouchi, 2019). To draw some conclusions from the insights of this argument, it appears that institution-creation in East Asia is focused on the governance and reinforcement of existing trade ties, especially the strengthening of already existing production networks through increasing the level of investment protection and decreasing the level of tariff and non-tariff barriers. This point will prove to be important in my discussion later.

Finally, recent research has been focusing on FTA heterogeneity, or in other words, the fact that different FTAs produce very different results for different countries (Baier, Bergstrand, & Clance, 2018). According to this research, when FTAs are evaluated individually, there are rather substantial differences between their trade-creation effects. One particular study found that only about a quarter of FTAs promote trade significantly, while three quarters of them do not (Kohl, 2014). While other research shows more robust overall trade-creation effects (Baier, Bergstrand, & Feng, 2014), it has becoming nevertheless more and more accepted nowadays that FTA-heterogeneity should be considered.

3.1.3 Global liberalization

Of great importance to the expansion of East Asian trade were trade agreements conducted on the global level. The WTO provided an important foundation for the East Asian regional production networks: tariff elimination in electronic parts and components under the umbrella of the Information Technology Agreement (ITA) has proven to be a highly effective source of trade facilitation. Because of the trade liberalization of semiconductor-related parts and components in the 1990s as well as the extensive use of the duty drawback system, production network-forming firms barely paid tariffs anymore (Kimura, 2006, p. 340). In addition, substantial trade-creation effects stemmed from China's WTO-accession in 2001. East Asian production networks might have been built on unilateralism, and solidified by bilateralism, but they would be nowhere near as robust as today without China joining the WTO and essentially becoming the factory of the world.

Vietnam's WTO-accession in 2007 is a similar case: for both China and Vietnam, joining the WTO required both widespread tariff liberalisation and the adoption of the international rules of commerce (Lardy, 2002). Thus, on the one hand, the WTO-accession required substantial domestic institutional alignments from two quasi-socialist economies in the region, while providing them access to the world markets, a vice versa.

The global institutional sphere had a large and direct effect on the domestic one, and the domestic realignment granted ample opportunities for trade.

3.1.4 Domestic institutions

Domestic institutions have been studied meticulously for decades by students of New Institutional Economics, and more recently, by institutionalist approaches of Development Economics. In fact, contemporary mainstream Development Economics holds up institutional quality and well-managed openness as the most important factor in explaining long-growth (Acemoglu & Robinson, 2012).

Nevertheless, a systemic exploration of the role of domestic institutional quality in explaining international trade and comparative advantage have only recently emerged in the literature. It was only after the abovementioned studies on the interplay between domestic institutions and long-term growth started to develop that traditional notions of the determinants of trade were starting to change. One such change came from the realization that even though traditional theories such as Ricardian trade economics or the Heckscher-Ohlin theorem explained trade, comparative advantage and economic development as a function of technological innovation and physical and human capital accumulation, these proximate drivers of growth are in fact themselves the product of deeper social, political, and economic processes, or in other words, institutions (Nunn & Trefler, 2014, p. 264).

Additional input for this strand of emerging research came from the literature on incomplete contracts and hold-up problems as applied to international trade and investment. The basic formulation of the hold-up problem was presented previously, but is briefly recanted here for clarity. “In the canonical model of incomplete contracts, an input supplier produces a customized input for a final goods producer. Because the customized input has greater value to the buyer than to other potential buyers, the investments made to produce the input are relationship-specific—i.e., their value is higher within the relationship than outside of it. If contracts are imperfectly enforced, then after the input supplier makes the relationship-specific investments, the purchaser has an incentive to renegotiate the terms of the original agreement. In short, there is a hold-up problem, e.g., Williamson (1985). Anticipating this ex-post renegotiation, the input supplier provides an inefficiently low level of relationship-specific investment and this inefficiency drives up the cost of production bilateral bargaining, which is the case

in many sectors where firms outsource the production of specialized inputs, for example specialized parts and components” (Nunn & Trefler, 2014, p. 266).

If we conceptualise institutional incompleteness as an institutional feature which varies across countries, the countries with better institutions will suffer less from hold-up, and as such, will be able to produce good requiring high levels of relationship-specific investment at lower costs. From this, it follows that good contracting institutions are a source of comparative advantage in industries that intensively use relationship-specific investments. Or more generally, “the country with better institutions will have a comparative advantage in the product whose costs are sensitive to the quality of institutions” (Nunn & Trefler, 2014, pp. 266–267).

Nunn (2007), and Levchenko (2007) confirmed this on an empirical level through examining the trade patterns of ‘contract intensive’ goods, or in other words, goods the production of which requires high levels of relationship-specific investment, and as such are subject to hold-up problems. Nunn’s findings were confirmed at the firm level (Ma, Qu, & Zhang, 2010), while another study reached the same results examining the trade patterns of Chinese provinces based on their institutional quality (Feenstra, Chang, Ma, & Spencer, 2013). Most of these studies look at the quality of the judicial system and to a lesser extent other domestic institutions, utilizing data predominantly from World Bank surveys among other sources.

A set of papers looks at the role of financial markets, which are obvious candidates as influential variables in the explanation of international trade and investment. A particular area which has been studied since the late 1980s concerns credit market imperfections, which raise costs in some sectors relative to others, and thus create comparative advantages (Nunn & Trefler, 2014, p. 275). Beck (2002) for example argued that manufacturing firms face up-front fixed costs, and since credit imperfections make it costly to finance these up-front costs, countries with well-developed financial sectors will have comparative advantage in manufacturing. In a different framework, Manova (2008) has also found that financial liberalization leads to a greater comparative advantage in goods that require large levels of external finance and small levels of tangible assets. In another paper, Manova (2013) found that credit constraints substantially reduce exports both at the extensive margin (whether or not to export, how many products to export) and at the intensive margin (how much to export) (Nunn & Trefler, 2014, pp. 275–279).

To summarize, the overwhelming majority of the literature confirms that institutions located on the national/domestic level play an important role in the determination of international trade and investment flows.

This is also confirmed by the contemporary economic history of East Asian production networks development. As Kimura and Ando (2005, pp. 179–180) and Kimura (2006, pp. 337–340) detail, the development of regional production networks has been backed by “a great transformation of the development strategies” of East Asian countries. Over the 1970s, most ASEAN members and China employed the so-called dual-track approach to industrialization, trying to foster both import-substituting and export-oriented industries at the same time, but—in contrast to Japan and South Korea—also relying on the utilization of incoming FDI for the lack of technological capacity and entrepreneurship. Nevertheless, until the mid-1980s, their attitude toward foreign companies was cautious: import-substituting FDI faced severe regulatory and financial burdens, and even some exporting sectors were operating in segregated export-processing zones. The policy transformation began in the latter half of the 1980s, after the realization that the dual-track efforts had been producing mixed results. First in Malaysia and Thailand, and from the early 1990s in the Philippines, Indonesia, and China, the focus began to shift decisively from import substitution to export orientation. The previously selective approach towards FDI was substituted by the “accepting everybody” policy in most (but not all) sectors. East Asian emerging economies began to actively compete for incoming FDI by upgrading their location advantages and thus reducing the cost of foreign investment.

Some of this upgrading was physical, some institutional, some financial; most of it occurred on the domestic, some of it on the global, and some of it on the regional level. Baldwin (2008, p. 453–462) describe the period from the mid-1980s to the 1990s as a period of “race-to-the-bottom” liberalization. Tariffs on intra-regional trade receded dramatically due to unilateral tariff reductions by states which sought to attract more inward FDI. A second component of FDI-attracting domestic policy was the duty-drawback system, which allowed exporting Multinational Enterprises to get waivers for the duties and tariffs on the imported inputs used in the production of their exported products. MNEs in export-oriented industries have been paying only a marginal amount of tariffs in these countries (Kimura and Ando 2005, p. 213). As Baldwin (2008, p. 458) underlines, “it is useful to think of this sort of tariff-cutting as “quasi-regionalism” because its effect is to reduce tariffs only on intra-regional trade, but it was not formally

discriminatory.” This process continued with expanded pace during the 1990s, when China’s liberalization fostered increased competition for inward FDI among industrializing states in the region.

As Kimura (2006, p. 338–339) details, national governments endeavoured to host as many exporting MNEs as possible through concentrated domestic policy accommodation. This (geographically) concentrated FDI-facilitation policy resulted in the emergence of agglomerated clusters of production, or in other words, industrial zones where a considerable number of MNEs set up production. This generated opportunities for vertical links within the agglomeration through arms-length’s transactions: firms could more easily cooperate with other firms nearby. Thus, the agglomeration itself has become one of the location advantages.

Clearly, substantial domestic political and institutional effort was made to make East Asian regionalization successful. The abundance of domestic policies promoting trade and FDI -hosting competitiveness continued even in the age of regionalization, from the early 2000s. For most states of the region, “comprehensive domestic regulatory reform dominates as an integration strategy” (Dee, 2008, p. 151).

More intuitively than theoretically, the importance of domestic institutional factors has been realized by business lobbies, policymakers and decision-makers who are involved in designing and negotiating economic agreements and regional institutions. This is reflected by the recent focus of FTAs of WTO+ and WTO-X areas, that is to say, going beyond the usual WTO commitments of tariff elimination. These encompass barriers to trade which are more complex and harder to alter than tariff rates, and most of these are related to the operation and quality of domestic institutions. For reference, these WTO+ and WTO-X areas are presented in the Table 13. The coverage of the Trans-Pacific Partnership and the Regional Comprehensive Economic Agreements is presented in Table14.

In fact, contemporary trade negotiations, often called 21st century trade agreements in the policy and media discussion, mostly aim to either harmonize or at least upgrade certain domestic institutions which appear to be strong inhibitors and/or drivers of international trade and investment. In this sense, “the bargain in a 21st century RTA is “foreign factories in exchange for domestic reforms”, not, “exchange of market access” as was the case for 20th century RTAs. Of course, market access is still important, but the deep provisions are not really about market access – they are about helping foreign

companies connect production facilities internationally, and do business locally” (Baldwin R. E., 2011, p. 28).

Table 13. WTO+ and WTO-X areas.

WTO+ Areas	WTO-X Areas	
	Anti-Corruption	Health
PTA industrial goods	Competition policy	Human rights
PTA agricultural goods	Environmental laws	Illegal immigration
Customs administration	Intellectual property rights	Illicit drugs
Export taxes	Investment measures	Industrial cooperation
SPS measures	Labour market regulation	Information society
State trading enterprises	Movement of capital	Mining
Technical barriers to trade	Consumer protection	Money laundering
Countervailing measures	Data protection	Nuclear safety
Anti-dumping	Agriculture	Political dialogue
State aid	Approximation of legislation	Regional cooperation
Public procurement	Audio-visual	Research and technology
TRIMS	Civil protection	SMEs
GATS	Innovation policies	Social matters
TRIPS	Cultural cooperation	statistics
	Economic policy dialogue	Taxation
	Education and training	Terrorism
	Energy	Visa and asylum
	Financial assistance	

Source: Hartman (2013)

Table 14. WTO+ and WTO-X issues in TPP and RCEP.

	TPP	RCEP	WTO
Trade in goods	O	O	O
Trade remedies	O	O	O
Trade facilitation	O	O	O
Technical barriers to trade	O	O	O
Sanitary and phytosanitary measures	O	O	O
Trade in services	O	O	O
Investment	O	O	*
Intellectual property	O	O	O
Competition policy	O	O	X
State-owned enterprises	O	O	X
Ecommerce	O	*	X
Government procurement	O	X	*
Environment	O	X	X
Labour	O	X	X
Dispute settlement	O	O	O
Cross-cutting issues	O	X	X
Standards, regulatory cooperation	X	X	X

Source: JETRO (2015)

In short, domestic institutions are recognized as both important drivers of international trade and investment, and as such, have been increasingly becoming targets of not only domestic upgrading, but international institutionalisation as well.

It should be noted, however, that this conceptualization of domestic institutions and domestic factors are broader than the usual approach in the political economy and IPE literature, which focuses explicitly in the role of business lobbies, exporters and import-competing industries, political parties, and particular domestic political interests in explaining domestic and international economic policies, and thus also economic outcomes. Thus, the domestic factors investigated in this dissertation will be limited to the understanding of institutions as conceptualized by institutional economics, which limits the scope of the study and its findings, but nevertheless provides a clearer empirical focus for the investigation.

3.1.5 Exogenous factors

In addition to domestic policy accommodation, the emergence of regional production networks was backed by technological improvements: the reduction of transportation costs and the advances in information-communication technology (ICT) made outsourcing viable. An additional, widely discussed factor in the relocation of production was the difference in labour costs between Japan and the rest of East Asia. But however important this factor is, in itself it would not have been enough to foster the sort of integration which has eventually emerged in the 1990s (Baldwin 2008, p. 454).

3.1.6 Summary

Potential driving and influencing factors and variables of de facto regional integration include (1) endogenous factors. The most prominent of these, as mentioned above, is technological progress, which affects both the cost structure of trade and investment and also the technological viability of it. Another endogenous, but well studied variable is economic distance, which is closely related to technological progress: the costs of physically moving goods have been decreasing rapidly. A third such factor, which is often discussed in the East Asian discourse is culture, although when it comes to its effect on economic progress or trade, the scope of empirical research is rather narrow.

A second set of such variables are made up of (2) domestic institutional factors. As briefly mentioned above, and as further discussed in the next section, domestic institutional quality as a determinant of growth and development features dominantly in

contemporary development economics and in strands of institutional economics. Furthermore, it has also been argued that most ‘comparative advantages’ are in fact not ‘natural,’ but are instead created through domestic policies aimed at raising competitiveness, either through investment in physical infrastructure and human resource, or by direct policy measures. Recently, International Economics have been paying more attention to the roles of domestic institutions as discussed later, the theoretical and empirical links between domestic institutions and international trade are being gradually established (Nunn & Trefler, 2014).

Further sources of trade which are only indirectly affected by either domestic or international institutions (3) include differences in unit factor costs, or in other words, cheap labour, which has been one of the main motivations for the relocation of production, which has been explored by FDI theory dealing with efficiency-seeking and resource-seeking FDI (Dunning, 1980). Moreover, traditional variables employed in economic studies for years, such as factors endowments and market size are important both for trade and investment levels (eg. market-seeking FDI).

Nevertheless, the importance of the traditional variables discussed in the previously cited research is not called into question here, only supplemented through the inclusion of these more broadly defined factors. Such traditional variables also include (4) the domestic political economy. Given the lessons derived from the political economy growth strategies and its history of integration, I treat the role of domestic development strategies with special care on the following pages, since for most of East Asia post-World War II development (and even more so prior to that), states tended to play an active and formative role in guiding the economy (Johnson C. , 1982; Woo-Cumings, 1999). Moreover, domestic interest group politics will be considered, but with the caveat that except for a small number of countries, such dynamics have not been explored in East Asia at an adequate depth.

Finally, the well-known institutions of International Relations will not be dismissed either: both regional and global international institutions, such as the ASEAN, regional FTAs, the WTO, etc., will be discussed as sources of integration and suppliers of regulation functions in East Asia—with the notation that East Asian regionalisation is considered to be heavily linked to globalisation on the following pages. Even though the literature is at least divided regarding their relative importance, I do not want to question their utility and their potential here.

Quite the contrary: the focus of this study is to measure the relative influence of these institutions, and as such, provide a more accurate picture of the drivers of regionalism and the influence of regionalism in East Asia. To develop this theme further conceptually, I regard these broadly defined institutions as parts of a broader ‘institutional mix’ which determines trade and investment levels. This means that I treat regionalisation as the outcome of, or the variable dependent on, a ‘mix’ made up of the aforementioned institutional regulating factors, which make up the independent variables of this study. The focus of the investigation is how much these various institutional variables, both ‘traditional’ and ‘broadly defined’ ones, contribute relative to each other to East Asian regionalisation.

This setting will be tested in chapter four through a gravity model, where institutional factors will serve as explanatory (independent) variables for regional integration, measured through trade.

3.2 Determinants of trade flows among East Asian economies

3.2.1 Operationalization of variables

What follows from the previous discussion is that East Asian regionalization can be conceptualized as dependent on multiple institutional variables across the regional, global, and the domestic level of analysis, with domestic institutions playing a substation role in the process.

To test this hypothesis, four ‘broadly defined institutional variables’ were operationalized: (1) the quality of domestic institutions and governance in a country; (2) financial development; (3) infrastructure; and (4) the quality of FTAs a dyad of countries is signatory to.

The governance variable is constructed from the World Bank’s Worldwide Governance Indicators (World Bank 2018). The data covers six governance indicators, which are the following: (i) Voice and Accountability; (ii) Stability and Absence of Violence; (iii) Government Effectiveness; (iv) Regulatory Quality; (v) Rule of Law; and (vi) Control of Corruption. These indicators represent institutional features that are relevant with regards to the transaction costs of international trade. As a considerable body of literature attests to, countries with stable and accountable political systems, less violence, and less corruption tend to be more efficient and more open economically (Acemoglu & Robinson, 2012), making them better suited to trade and to host and/or export FDI. Regulatory quality has been proven to be an especially important factor for

the entry of foreign companies (Helpman, Melitz, & Rubinstein, 2008). Rule of law represents a good measure of the quality of contracting institutions, and as such is a relevant determinant of the hold-up problems affecting international trade and investment. This is especially important in the East Asian case, where, as the fragmentation and agglomeration theory has shown, the high-frequency trade of intermediary inputs (of varying levels of relationship-specific investment) dominates intra-regional trade (Kimura & Ando, 2005).

The economics literature suggests that efficient credit allocation and a sound financial infrastructure are necessary requirements for industrialisation, growth, investment, and thus trade and integration. To test this assumption, a financial development indicator is constructed by combining two values: domestic credit to the private sector, and exports and imports of financial services. The domestic credit score signifies the capacity of the financial sector and has been used in previous studies to measure financial development (Beck, 2002; Becker, Chen, & Greenberg, 2013). The exports and imports of financial services measured in relation to GDP represent the international embeddedness and competitiveness of the financial sector. Data was gathered from the World Bank World Development Indicators, and national banks of regional states.

Infrastructure is measured across two variables. The first is primary energy supply per capita. Energy supply is vital for industrial production and thus trade and investment, and in fact one of the major challenges facing low-income countries in attracting inward FDI. Data is obtained from ESCAP and the US Energy Information Administration. The second infrastructure variable included is a combination of three components: landline phone subscriptions, mobile phone subscriptions and broadband internet subscriptions per million persons. Data is from the World Bank World Development Indicators.

It should be noted that variable selection was in many cases ‘path-dependant’ due to scarce data availability, for relevant data was hard to obtain for the least developed states of the region, Laos, and Myanmar, and to a lesser extent for Vietnam as well. In some cases, even more developed countries lacked comparable time-series data for important infrastructural or institutional indicators. Given that the aim of this study is to investigate longer-term effects of changes in institutional features, the ability to gather comparable time-series data for the longest period possible was prioritized.

The countries covered in the regression model were the 16 countries taking part in the RCEP negotiations, since should the RCEP be ratified, this group would represent

the broadest institutionalized form of East Asian regional integration. The data used for the gravity model covered the years from 1996 to 2016, since these were the years for which data on domestic institutional quality was available from the World Bank. Additional data for the gravity model were used from the gravity datasets of Head & Mayer (2014), and Gurevich & Herman (2018), as well as the UN COMTRADE trade database.

To compare the effects of international institutions with the variables described above, additional variables were used. First, in some specifications of the model, dummy variables were used to measure the effects of different FTAs. Second, to evaluate not just the existence but also the quality of FTAs, a variable measuring the depth of FTAs was included as operationalized by Petri & Plummer (2016). This variable is a numerical score which is based on the length of the agreement text, the coverage of sub-issues (such as government procurement, dispute settlement, IPR, etc.), and a WTO score, which signifies how far an agreement goes in liberalisation. The conceptual reason for including this variable is that ‘deeper’ contemporary FTAs pay considerable attention to improving trade and investment relations by mandating domestic reform. It is thus reasonable to assume that deeper FTAs have a larger effect on trade, and that deeper FTAs serve as special vehicles for domestic upgrading.

Finally, the effects of WTO-membership were measured through the traditional method of a dummy variable. This control variable is merited by the role it has played in China’s opening-up, as well as in the regional auto- and electronics industries, as explored above.

3.2.2 The gravity models

To evaluate the effects of the previously conceptualized variables on regional integration, this study utilizes three types of the gravity model of trade. First, we estimate the structural gravity model with fixed effects as described by Anderson and van Wincoop (2003) and further formulated by Baier & Bergstrand (2007). The basic model can be summarized with the following equation:

$$p_{ij}x_{ij} = \frac{Y_i E_j}{Y} \left(\frac{t_{ij}}{\prod_i P_j} \right)^{1-\sigma}$$

where $p_{ij}x_{ij}$ represents the bilateral trade value from country i to country j , Y_i represents the total sales of country i , E_j denotes the total expenditure of country j , Y is

the sum of sales in the world, t_{ij} captures bilateral iceberg trade costs from country i to j , P_j is an inward multilateral resistance term, $\prod_i$ is an outward multilateral resistance term, and σ is the elasticity of substitution. The model is estimated first using the following equation, the specification of which is based on the formulation of Yamanouchi (2019):

$$\ln X_{ijt} = \exp (\alpha WTO_{ijt} + \beta_1 FTAScore_{ijt} + \beta_2 Governance_{ijt} + \beta_3 ITInfrastructure_{ijt} + \beta_4 Energy_{ijt} + \beta_5 Finance_{ijt} + \delta_{ij}^B + \delta_{it}^X + \delta_{jt}^M) + \varepsilon_{ijt}$$

where X denotes bilateral merchandise trade export values between country i and j at time t ; WTO represents a dummy variable which takes the value of 1 if both countries are WTO-members in a given year; σ_{ij}^B is a country-pair fixed effect and reflects all time-invariant factors which affect the bilateral trade values, such as distance, language, and the historical relationship between two countries; δ_{it}^X is an exporter-time fixed effect and reflects the production capacity of exporter, outward multilateral resistance, and unilateral trade policies; and δ_{jt}^M is an importer-time fixed effect and reflects the total expenditure of the importer, inward multilateral resistance, and unilateral trade policies. In addition, the combination of these two country-year fixed effects controls for bilateral exchange rates.

The rest of the variables correspond to those described above. *FTAScore* represents the depth of the trade or economic partnership agreements in place between country i and j in year t ; as calculated by Petri & Plummer (2016). To avoid having zero values in the dataset, if there is no agreement in place between country i and j , the variable takes the value of 0.01. The *FTAScore* value is introduced with a three-year lag after the implementation of an agreement. Although Baier & Bergstrand (2007) found that the trade creation effects of FTAs are significant ten years after their inception, most East Asian FTAs are too recent to allow for a ten-year lag in calculations. To accommodate this, a shorter time-lag is used.

Governance denotes a governance variable which is constructed from the World Bank's Worldwide Governance Indicators (World Bank 2018). The variable is constructed by taking the mean of the values of the six indices for a given country in a given year. Then the variable is constructed on a country-pair level and is used in calculations as a bilateral variable, since as pointed out by Baier & Bergstrand (2009), fixed effects versions of the gravity model cannot be used with country-specific variables.

The same holds true for the rest of the variables as well: the *IT Infrastructure* variable, the *Energy* variable, and the *Financial development* indicator, which represent data as specified in the previous section. In all estimations, standard errors are robust and clustered by country pair. The models are estimated using OLS.

For the sake of comparison, a second gravity model is calculated using the usual gravity variables instead of the country-pair fixed effect but retaining exporter-time and importer-time fixed effects.

$$\begin{aligned} \ln X_{ijt} = \exp (&\alpha WTO_{ijt} + \beta_1 FTAScore_{ijt} + \beta_2 Governance_{ijt} \\ &+ \beta_3 ITInfrastructure_{ijt} + \beta_4 Energy_{ijt} + \beta_5 Finance_{ijt} \\ &+ \beta_6 \ln Distance_{ij} + \beta_7 Contiguity_{ij} + \beta_8 CommonLanguage_{ij} \\ &+ \beta_9 CommonColonizer_{ji} + \delta_{it}^X + \delta_{jt}^M) + \varepsilon_{ijt} \end{aligned}$$

where *Distance*, *Contiguity*, *Common Language* and *Common Colonizer* represent the traditional gravity model variables used to measure bilateral ‘distance’ and thus serve the role which country-pair fixed effects serve in the previous model, although with admittedly lesser predictive value. This model is estimated using OLS as well.

To investigate individual FTAs separately instead of using only FTA-scores, an additional gravity model was estimated, where dummy variables represent the five ASEAN+1 FTAs, namely the Australia–New-Zealand–ASEAN FTA (AANZFTA), China–ASEAN FTA, India–ASEAN FTA, Japan–ASEAN FTA/EPA, and South Korea–ASEAN FTA. Similarly to the *FTAScore* variable, these dummies were introduced with a three-year lag. The model was estimated with two specifications, one in which only exporter-time and country-pair fixed effects were used, and one following the methodology of Yamanouchi (2019), where importer-time fixed effects were added. The results are presented in Table 16.

As mentioned earlier, the fixed effects model does not allow for the measurement of exporter- and importer-specific variables, as these would be absorbed by the fixed effects. For this reason, a fourth model was used to measure the exporter- and importer-specific effects of the institutional variables. For this model, a ‘substitute’ for fixed effects was used. Baier & Bergstrand (2009) suggest that the multilateral resistance terms introduced by Anderson & van Wincoop (2003) can be ‘approximated’ through observable trade costs. Following Baier & Bergstrand (2009), I employed two approximations: one based on bilateral distance, and one on a remoteness variable as

defined by Head & Mayer (2014). These variables were constructed according to the following equation in Baier and Bergstrand (2009, p. 80).

$$MRDIS_{ij} = \left[\left(\sum_{k=1}^N \theta_k \ln DIS_{ik} \right) + \left(\sum_{m=1}^N \theta_m \ln DIS_{mj} \right) - \left(\sum_{k=1}^N \sum_{m=1}^N \theta_k \theta_m \ln DIS_{km} \right) \right]$$

Thus, the model is estimated as follows:

$$\begin{aligned} \ln X_{ijt} = & \alpha + \beta_1 Governance_{it} + \beta_2 Governance_{jt} + \beta_3 ITInfrastructure_{it} \\ & + \beta_4 ITInfrastructure_{jt} + \beta_5 Energy_{it} + \beta_6 Energy_{jt} + \beta_7 Finance_{it} \\ & + \beta_8 Finance_{jt} + \beta_9 MRDIS_{ij} + \beta_{10} \ln GDP_{it} + \beta_{11} \ln GDP_{jt} \\ & + \beta_{12} \ln Population_{jt} + \beta_{12} \ln Population_{it} + \varepsilon_{ijt} \end{aligned}$$

For comparison's sake, a fixed effects model without exporter- or importer-specific fixed effects, but with country-pair fixed effects is estimated with the same variables. Moreover, a random effects model is used for further comparison, since it has been suggested that a random-effects regression accounts for unobserved heterogeneity, and yet allows the inclusion of variables that would be collinear with the fixed effects (Shepherd B. , 2016, p. 28). Nevertheless, the usage of random effects for gravity equations has not been theoretically developed, and has only been scarcely used, which questions the validity of this method. The results are presented in Table 17.

3.2.3 Estimation results and discussion

The results show that in all specifications, the quality of governance, or in other words, domestic institutional quality, and WTO-membership are significant determinants of trade. Quality of governance consistently has the highest coefficient among the variables measured, confirming the hypothesis that domestic institutions are important factors influencing regional trade.

One interesting exception is that when the exporter- and importer-specific variables are estimated in a model with country-pair fixed effects or random effects, only the importer-side governance variable is significant, while the exporter side variable is not. This is contrary to what one would expect: domestic institutional quality is often discussed as an important factor in the context of economic development and industrial upgrading; hence it is expected to have a stronger significance on the exporter side. On the other hand, it can be considered that institutional quality often goes hand in hand with economic openness, hence countries with better institutions might be more open to imports. In any case, given the previously discussed theoretical weaknesses of the random-effects model, the importance of these exceptions is quite moderate.

Coefficients for WTO-membership are significant across the different specifications. When specified with fixed effects, the WTO dummy tends to be stronger than FTA quality and all other FTA dummies except for one. This validates the intuitive argument that global institutional membership indeed remains an important factor in explaining East Asian trade relations. This is hardly surprising given that China's WTO-accession in 2001 led to the rapid expansion of its trade.

Table 15. Estimation results for the first configuration of the gravity model

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS
ln(Distance)		-0.729*** (0.168)	-1.347*** (0.163)	-1.150*** (0.163)
contiguity		1.086*** (0.249)	0.748** (0.306)	0.842*** (0.298)
Common colonizer		0.808*** (0.293)	0.191 (0.357)	0.506 (0.351)
Common language		-0.0895 (0.182)	-0.0223 (0.216)	0.00456 (0.192)
Exporter ln(GDP)			0.883*** (0.111)	0.983*** (0.115)
Importer ln(GDP)			0.269* (0.143)	0.756*** (0.173)
Exporter ln(Population)			0.164 (0.107)	0.108 (0.109)
Importer ln(population)			0.642*** (0.139)	0.200 (0.163)
WTO	0.360*** (0.117)	0.676*** (0.180)	0.584*** (0.201)	0.399** (0.191)
FTA score	0.270** (0.133)	0.350 (0.265)	1.003** (0.387)	2.648*** (0.415)
Governance	0.569** (0.269)	0.695** (0.351)	2.291*** (0.331)	1.155*** (0.385)
IT Infrastructure	0.0952** (0.0437)	0.0588 (0.0554)	-0.104** (0.0477)	0.215*** (0.0636)
Energy supply	0.351* (0.182)	0.546*** (0.206)	0.504*** (0.185)	-0.0682 (0.200)
Financial development	0.0181* (0.00951)	0.0112 (0.0286)	0.0572*** (0.0215)	0.0512** (0.0211)
Constant	-1.654 (1.753)	6.570** (2.722)	-25.10*** (3.554)	-34.40*** (4.127)
Observations	4,656	4,656	4,656	4,656
R-squared	0.958	0.890	0.780	0.800
Country-pair fixed effects	Yes	No	No	No
Importer-time fixed effects	Yes	Yes	No	No
Exporter-time fixed effects	Yes	Yes	No	No
Year fixed effects				Yes

The significance of the other variables is weaker. Energy supply is significant and has a high coefficient in most specifications, but its significance is weak when measured in the model with the strongest predictive value, the one with exporter-time, importer-time and country-pair fixed effects. IT infrastructure tends to have a relatively meagre

and often insignificant effect, most likely because the cross-country differences in the variables as constructed here are rather small. It is likely that the differences in ITC attainment between countries are more nuanced than what could be estimated with the relatively crude comparative data available. Financial development is strong and significant when the country-specific variables are measured separately, but its significance is weak in fixed effects models when constructed bilaterally.

Table 16. Estimation results for the second gravity model

VARIABLES	(1) OLS	(2) OLS
WTO	0.366*** (0.117)	0.337*** (0.0996)
AANZFTA	-0.00193 (0.0863)	0.0436 (0.104)
China–ASEAN FTA	0.258* (0.138)	0.363*** (0.126)
India–ASEAN FTA	0.295* (0.163)	0.626*** (0.226)
S. Korea–ASEAN FTA	0.224 (0.152)	0.0969 (0.172)
Japan–ASEAN EPA	0.162 (0.106)	-0.143 (0.125)
Governance	0.569** (0.272)	0.525** (0.225)
IT Infrastructure	0.0930** (0.0437)	0.123*** (0.0381)
Energy supply	0.341* (0.181)	0.265** (0.131)
Financial development	0.0179* (0.00956)	0.00765 (0.00893)
Constant	-1.547 (1.751)	1.361 (1.218)
Observations	4,656	4,656
R-squared	0.958	0.954
Country-pair fixed effects	Yes	Yes
Importer-time fixed effects	Yes	No
Exporter-time fixed effects	Yes	Yes

Among the FTAs, only the China–ASEAN and the India–ASEAN agreements are significant in this model. This might mean on the one hand that the FTAs of ASEAN with developed countries are highly heterogenous, meaning that they might affect certain sectors and countries positively, while others negatively or neutrally. This is not inconsistent with previous research (Ando, Urata, & Yamanouchi, 2019; Yamanouchi, 2019). On the other hand, this result suggests that in the case of the ASEAN, due to its diversity, even less ambitious FTAs might be effective in raising trade values: even though the China–ASEAN and the India–ASEAN agreements are of considerably lower

quality than for example the EPA conducted with Japan, they still create substantial new trade flows among previously relatively closed economies. This in line with the recent findings of Baier, Bergstrand, & Clance (2018) that FTAs have substantially higher effects for countries with lower per capita GDP levels.

Table 17. Estimation results for the third gravity model.

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS
<i>TRemoteness</i>		-0.569*** (0.0756)		
<i>TDistance</i>	-1.276*** (0.251)			
Exporter ln(GDP)	-0.204 (0.232)		0.695*** (0.0943)	0.288 (0.205)
Importer ln(GDP)	0.0499 (0.219)		0.812*** (0.0806)	0.819*** (0.167)
Importer ln(Population)	0.725*** (0.213)	0.812*** (0.0602)	-0.0568 (0.0357)	-0.0279* (0.0149)
Exporter ln(Population)	1.100*** (0.231)	0.949*** (0.0635)	0.0454 (0.0354)	0.0157 (0.0142)
Importer Governance	1.138** (0.570)	1.973*** (0.528)	0.609*** (0.217)	0.795*** (0.242)
Exporter Governance	1.002** (0.507)	1.650*** (0.431)	-0.0716 (0.252)	0.154 (0.288)
Exporter IT Infrastructure	0.00795 (0.00662)	-0.0117* (0.00702)	0.00574* (0.00314)	0.00686** (0.00338)
Importer IT Infrastructure	0.00825 (0.00613)	-0.00997 (0.00695)	8.54e-05 (0.00314)	0.00369 (0.00369)
Exporter Energy supply	1.359*** (0.284)	1.289*** (0.201)	0.805*** (0.164)	1.051*** (0.224)
Importer Energy supply	0.590** (0.245)	0.759*** (0.167)	0.208* (0.110)	0.310** (0.140)
Exporter Financial dev.	0.683*** (0.258)	0.546** (0.257)	0.00806 (0.0987)	-0.00590 (0.101)
Importer Financial dev.	0.578** (0.227)	0.495** (0.227)	0.210** (0.0870)	0.203** (0.0906)
Constant	-23.82*** (5.230)	-21.93*** (1.539)	-41.81*** (2.741)	-37.90*** (4.132)
Observations	4,656	4,656	4,656	4,656
R-squared	0.729	0.735		0.949
Country-pair fixed effects	No	No	No	Yes
Bilateral trade cost approximations	Yes	Yes	No	No
Random effects	No	No	Yes	No

Apart from heterogeneity, another possible effect which has not been explored here in detail is endogeneity: in the case of the Japan–ASEAN EPA and the South Korea–ASEAN FTA, considerable trade and production networking activity had preceded the implementation of the FTA, and Japan had already conducted a number of bilateral treaties with individual ASEAN members. Thus, one can hypothesise that the ASEAN–Japan EPA and the South Korea–Japan FTA have institutionalised trade ties which had

already existed. Moreover, the young age of regional FTAs has to be considered as well: the more ambitious trade agreements of the region have entered into force relatively recently, thus it is possible that not enough time has passed since to measure their effects trade-creation.

When it comes to the depth of FTAs, the FTA score variable is significant in three models out of four, yet loses its significance when time-invariant unobservable trade costs (or in other words, country-pair fixed effects) are dropped. The *FTAScore* variable is also weaker than the WTO dummy in the models, suggesting that while FTA depth is important in trade creation, WTO-membership remains highly influential in regional trade.

Finally, an important limitation should be noted when interpreting the results. The dataset contains data only for the sixteen negotiating partners of the ASEAN Plus Six, and no data for the rest of the world, as our goal was to discern the effects of various institutional variables on East Asian intra-regional trade. From this, it follows that variations across countries and across time come only from the variations among these sixteen countries. Thus, the discussion presented here is only valid for the determinants of trade among these economies, and especially in case of the WTO dummy and FTA dummies, do not explain extra-regional effects.

3.3 Determinants of GVC participation in East Asia

The previous section investigated the effects of certain political and structural variables on trade flows among economies in East Asia. This section, in contrast, will investigate the determinants of production network participation of East Asian economies.

The two are not the same. First, the large majority of production network trade is concentrated in a smaller number of sectors, which are usually more contract intensive, and consequently are expected to be more heavily influenced by policy factors. Second, as noted earlier, customs data does not contain information on the value-added content of trade, hence the exporters domestic contribution, as well as the gross amount of economic exchange among nations, can be vastly overstated.

Third, given the prevalence of trade-based industrial upgrading strategies in East Asia, and the fact that at the present time, industrial upgrading in emerging economies is being achieved predominantly through GVC participation (World Bank, 2020), it can be inferred that the political significance of GVC participation is higher than that of trade

per se. As Antrás (2020, p. 9) pointed out, “by allowing a finer international division of labor, the growth of GVCs is associated with greater income gains from trade than a commensurate expansion of traditional trade. Intuitively, GVCs allow countries to benefit from the comparative advantage of other countries not only at the sectoral level, but also at the stage level within sectors.”

3.3.1 Operationalization of GVC participation

The model outlined here will follow from the methodological approach to the measurement of GVCs outlined in section 2.5.2. The dependent variables will be the share and level of GVC-related exports of a given country. Moreover, to get a better picture of the determinants of participation in different stages of production, the determinants of backward and forward participation will be investigated as well.

The independent variables will follow the logic outlined in the previous sections and focus on domestic policies and international institutional features directly and indirectly affecting trade costs, as well as domestic and exogenous variables which can influence specialization and trade in a given economy. Data for the variables will be used from World Bank (2020), which is in turn collected from a number of different databases. The dependent variables are GVC participation shares, GVC participation levels, and GVC imports and exports calculated from the EORA input-output database covering the years from 1990 to 2015.³⁴

The first independent variable is the weighted mean (in per cent) of the applied tariff rate for manufacturing products sourced from the World Development Indicators database. As previously mentioned, tariff rates have traditionally been the most important impediments to trade, hence this indicator reflects the effects of both unilateral tariff reductions and FTAs (which were not included as dummies).

The second independent variable is the logarithm of net FDI inflows from the UNCTAD database, which in East Asia and all over the world are heavily tied to GVC activity. The third is the distance to the three largest economic blocs, China, the US, and the EU, from the CEPII database. The fourth is the political stability index from the World Governance Indicators database introduced previously. The fifth is domestic industrial capacity, which is constructed from the WDI database by multiplying nominal GDP with

³⁴ The reason for relying on the EORA database for these calculations is that the data from this database on GVC participation contains the widest range of years covered and shows the best overlap with the data used for the control variables.

the share of manufacturing in value-added. In other words, this variable represents manufacturing value-added in current US dollars.

The sixth variable is the share of low skilled employment, which is computed as the logarithm of the share of employment of skill level 1 according to the International Standard Classification of Occupations in total employment from the International Labor Organization's database. The seventh is the rents from resource extraction as a percentage of GDP, to control for the GVC participation of commodity exporters, constructed from WDI data. The eighth variable is logarithm of real capital stock in constant 2011 prices divided by real GDP also at constant prices, from the Penn World Tables and the WDI. And the final independent variable is the appreciation of the nominal exchange rate from the WDI database.³⁵

These variables were chosen partly for data availability, and partly as they appear in the previous studies and as such offer the possibility of comparing the East Asian determinants of GVC participation with the global determinants. Such a comparison would give more insight as to whether there are region-specific differences with regards to the determinants of GVC formation in East Asia.

3.3.2 The model

The methodology used in this section is a regional application of the methodology developed by Fernandes, Kee, & Winkler (2020) and the World Bank (2020), who conducted a global, cross-country and cross-industry investigation on the determinants of GVC participation.

Since investigating GVC participation entails using exporter-specific and not dyadic dependent variables, instead of a gravity model, a least squares between effects (LS-BE) model is used for these estimations. The data is segmented into five-year periods from 1990 to 2015, and the regression is based on average values for each period. Based on the work of Fernandes, Kee, & Winkler (2020, p. 10–16), this model takes the following form:

$$Y_{ct} = \beta_0 + \beta_1 * X_{ct} + I_t + \varepsilon_{ct},$$

³⁵ In the case of tariffs and FDI inflows, it has been suggested that endogeneity issues might arise: countries which already participate in GVCs might lower their tariffs and attract additional FDI to take advantage of agglomeration effects. Nevertheless, Fernandes, Kee & Winkler (2020, p.12–16, 18–20) tested a number of instrumental variables based on trade theory to discern the effects of endogeneity, and that the specification of the model was satisfying. Since we rely on the same model as described in the next section, these tests are not reproduced here.

where c and t stand for country and decade subscripts; Y is a measure of GVC participation in shares or in levels or a measure of gross exports, and X is a vector including the independent variables. I_t are five-year time-fixed effects, and ε is the error term.

The reasons for using decadal averages are twofold. First, GVC participation and the determinants behind it change rather slowly, hence yearly estimations would lead to more extreme variation, and would pose problems due to possible measurement errors in IO data. Second, GVC participation measures and determinants exhibit large cross-country variability, which is exploited by LS-BE estimations to provide a more precise identification of the independent variables (Fernandes, Kee, & Winkler, 2020, p. 11.).

Nevertheless, while Fernandes, Kee, & Winkler (2020) and the World Bank (2020) use ten-year averages, I opted for a shorter period of time to increase the number of observations. The lags introduced for the independent variables are five years, based on the assumption that as described in the previous historical overview chapter, the development of GVC activity in East Asian from the 1990s was relatively rapid and complex compared to most other regions of the world.

3.3.3 Estimation results

Estimation results of the regression are presented below in the following table. While tariff rates have a negative effect on the backward GVC participation share, they are statistically insignificant in all other cases. The situation is identical in the case of distance from the main hubs of the world economy, which is only significant, and as expected, negative in the case of backwards participation shares. Domestic capital and low-skilled labor share are positively correlated with backwards GVC activity, but the latter has an expected negative effect on forwards participation. In contrast to the previous model, political stability is only significant in the case of backward GVC participation levels.

FDI and industrial capacity are the best determinants of GVC participation and GVC trade across all dependent variables. FDI inflows are highly correlated with backwards participation and both exports and imports, although not with forward participation. Industrial value-added are significant in all scenarios apart from forward participation share, although it exhibits a negative relationship with the backward participation share. Nevertheless, this is hardly unexpected since economies with higher value-added are specializing in services and niche industrial sectors which are more likely

to result in forward linkages. Additionally, exchange rate movements have the strongest negative effects on imports and backward GVC participation, although they are not significant in the case of forward participation and exports.

Table 18. Results of the regression model.

VARIABLES	Backward share	Backward level	GVC imports	Forward share	Forward level	GVC exports
Average tariff rate	-0.016*** (0.002)	-0.047 (0.042)	-0.016 (0.016)	-0.001 (0.003)	-0.037 (0.030)	-0.026 (0.027)
FDI inflows	0.098*** (0.011)	0.609** (0.190)	0.535*** (0.072)	-0.025 (0.015)	0.300* (0.135)	0.486** (0.122)
Distance from GVC hubs	-0.149** (0.052)	-0.420 (0.879)	0.413 (0.384)	-0.049 (0.070)	-0.804 (0.626)	-0.065 (0.650)
Political stability	0.026 (0.022)	1.199** (0.374)	0.288 (0.169)	-0.073* (0.030)	-0.628* (0.266)	0.157 (0.286)
Industrial capacity	-0.092*** (0.010)	0.501** (0.165)	0.492*** (0.067)	0.018 (0.013)	0.685*** (0.117)	0.472** (0.113)
Resources rents / GDP	-0.016*** (0.002)	-0.100** (0.028)	-0.046** (0.011)	0.010** (0.002)	0.065** (0.020)	0.009 (0.019)
Capital / GDP	0.069** (0.024)	1.831** (0.414)	-0.029 (0.185)	-0.049 (0.033)	-0.158 (0.295)	-0.144 (0.313)
Low skilled labor / GDP	0.025** (0.008)	0.063 (0.138)	0.240** (0.058)	-0.020 (0.011)	-0.274** (0.099)	0.165 (0.098)
Exchange rate	-28.321*** (3.852)	-187.748** (65.751)	113.689** (24.615)	8.632 (5.254)	3.942 (46.793)	-84.554 (41.592)
Observations	43	43	41	43	43	41
R-squared	0.992	0.993	0.998	0.937	0.994	0.995
Number of countries	16	16	16	16	16	16

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

It should be noted that a possible explanation for the weak coefficients and statistical significance in the case of forward participation may result from the fact that the overwhelming majority of regional economies have a pronounced backwards orientation in GVCs. Consequently, forward participation levels are relatively limited, making it more problematic to dissect the determinants of forward participation in the case of East Asia.

3.4 Complex determinants of trade and GVC participation

The two empirical models employed in this chapter aimed to answer the first sub-research question posed in section 1.4, namely: *on which level of analysis are the main*

determinants of regional trade, and production network development located in East Asia? The hypothesis posited that the main determinants of trade and GVC participations, and consequently, international interdependence, are located on the national level.

The empirical tests partly validated this hypothesis, with some caveats. First, it is clear from these results, as well as previous research, that domestic institutional quality, economic policies and good governance practices are crucial for trading and international production sharing. Second, the models employed here have shown regional instruments and institutions as secondary in importance.

Nevertheless, as the estimation results show, contemporary trade in general, and GVC trade in particular, are results of a highly complex set of determinants, the effects of which are heterogeneous among country-groups and country-industries.

As noted earlier, some comparisons can be made to large-n cross-country results in Fernandes, Kee & Winkler (2020) and World Bank (2020), since I have worked with similar data and modeling. One difference apparent from these is that while in the global setting tariffs exhibit a statistically significant, albeit weak negative effect across the board, it appears that tariffs are less important determinants in the case of East Asia.

Capital endowment is more pronounced in the case of the model for East Asia, as well as the effects of exchange rates and the skillset of labor. On the other hand, distance plays a smaller role than globally, which appears to suggest that East Asia's logistical situation is above average after all. Yet the fact that the variables representing physical distance and remoteness continue to show a strong negative coefficient also shows that even in a world where the globalization of value chains progresses rapidly in parallel with the decrease of logistical and communication costs, trade and production network activity remains regionally concentrated. Thus, these results do not support the notion that globalization or the potential economic collateral damage of the China-US rivalry has rendered East Asian regionalism and regionalization futile.

Moreover, the observations of the previous models can be supplemented with East Asia-specific findings of the previous studies. Fernandes, Kee & Winkler (2020) found that ASEAN-membership had a meaningful and statistically significant effect on GVC participation, which was higher than the corresponding coefficient for EU-membership.

The World Bank (2020, pp. 57–58.) has found that the effects of tariffs rates are significantly larger for commodities and limited manufacturing than in the case of advanced manufacturing and innovative activities. Of course, this is partly due to the fact

that advanced countries already have relatively low levels of tariffs, which is consistent with the arguments of the literature on the heterogeneous effects of FTAs.

Similarly, the importance of political stability is higher for the more advanced stages of production, and in fact negative for commodities and limited manufacturing, showing that much of commodities exporters and less developed manufacturing hubs experience political turmoil fairly often.

While many recent political efforts at managing and shaping regional interdependence have either aimed to reduce tariffs or provide physical infrastructure, it appears from the data that FDI inflows and domestic capital formation are more effective channels of fostering closer economic relations. From this perspective, investment treaties might be more relevant tools for enhancing political clout over target countries. This is also relevant for the recently emerged debate on the institutional strategies of regional and global actors. As GVC participation shows a strong positive coefficient with regards to GVC participation, strategies which prioritize easing FDI regulation and propose investment facilitation may result in more robust and durable transnational economic connections.

Such outcomes, however, can be achieved in more than one way. The BRI, for example, provides no formal framework for *de jure* investment liberalization, but at the same time it is rather successful in spreading Chinese FDI into areas of the world economy where previously Chinese enterprises were virtually non-existent. In stark contrast, the CPTPP provides legally binding rules which facilitate market-based investment initiatives through deregulation. And in other cases, the market appears to work by itself: as noted in the next sections, the European Union remains the top source of FDI within the ASEAN, even though the legal frameworks between the EU and the ASEAN are far from robust.

Another conclusion from the estimation results is that the role of traditional FTAs aimed at reducing tariffs in providing further impetus for regional integration is limited but the preservation of the existing arrangements remains important for supporting current trade ties. The former of these two arguments stems from the estimation results showing the importance of domestic institutional variables and the lack of strong across-the-board correlation between tariffs and production sharing. As noted above, given the strong influence of institutional factors and investment, only trade agreements which cover such institutional and financial factors can be decisive going forward. The exceptions are a number of small and insular economies with still high tariff rates such

as Laos, Cambodia, and Myanmar, although these will hardly influence the regional picture significantly.

On the other hand, the trade war and the supply chain disruptions of the COVID-19 era have shown that even well-established economic networks can face severe crises if the rules and norms underpinning the global and regional trading regime are challenged and undermined. Due to data availability, the regression models in this section were not able to capture the effects of the trade war and the Covid-pandemic, hence the results here do not mean that a potential breakdown of the institutional framework providing for trade and investment liberalization in East Asia would not lead to serious economic consequences.

4 Interdependence in production networks

The previous section looked at the political, economic, technological, and structural determinants of trade flows and GVC participation among East Asian countries. This section aims to answer the second sub-question of the dissertation, namely: *Through which channels does the economic influence of nation states manifest in production networks in East Asia? Or in other words, how can state-level leverage and political power be conceptualized and measured in production network-based interdependence in East Asia, and what does such leverage indicate in terms of political power?*

This question is at the forefront of the political frictions described in the introduction and literature review. An increasingly common narrative suggests that dependence on inputs from strategic competitors poses a vulnerability which should be eliminated or at least controlled through decoupling or reshoring. The former strategy posits that due to national security risks posed by increased reliance on political competitors, the economic ties that bind the potential rivals together must be severed or at least severely weakened. The latter strategy posits that the outsourcing of production presents a threat to the welfare and security of the state, and in order to alleviate these threats, production needs to be repatriated to the home country from states perceived as competitors or rivals. This sort of discourse follows from the neorealist theories which argue that interdependence leads to conflict, or at least amplifies conflicts of interest (Barbieri K. , 2002; Mearsheimer, 2010).

In contrast to the neorealist IR and IPE literature, neoclassical economics suggests that decoupling is not a viable strategy, for it would lead to a loss in competitiveness and aggregate welfare. Moreover, liberal understandings of interdependence argue that as long as the vulnerabilities are mutual, they act as stabilizers rather than sources of conflict

A central issue to this debate is what sort of vulnerabilities does the interdependence between the US and China, US allies and China, as well as East Asia and the rest of the world present. In other words, how severe is the exposure to foreign inputs and markets, and what sort of strategic elements does this exposure carry. Referring to the weaponized interdependence theory discussed earlier, since international economic and financial networks are hierarchical, the higher the position of a state actor within these networks, the higher the leverage it possesses. This higher position can stem from control over certain technologies or production processes which are both unique and vital for economic activity in other states. Controlling such stages of production can lead

to chokepoint effects, where the dependence is asymmetrical, and thus can be exploited by the state actor. On the other hand, traditional quantitative sources of leverage, such as market power, still play an important role in the politics of international economic relations.

In the following section, I look at a number of different measures to evaluate how technological attainment and the symmetry of dependence can be discerned in GVCs and other economic networks. I will proceed from rather simple quantitative aggregation to more complex indices, which might shed more light on production hierarchies in East Asia and beyond.

4.1 Interdependence and structural power in GVCs

4.1.1 Conceptualizing interdependence in GVCs

Production networking represents an ‘updated’ version of what Keohane & Nye (1977) termed complex interdependence: the sensitivity, or the strength of the effects on one state of occurrences in another, stems from the fact that the patterns of consumption, production, and innovation in different regions, and states can affect whole industries in other regions, and states. In the period of classic interdependence research in the 1970s, the production logic of trade, and investment was in its infancy. Most of the international exchange of goods involved finished products, while trade in services was rather negligible in comparison. In contrast, in present-day East Asia, intermediary inputs account for as much as half of all trade (Obashi & Kimura, 2018, p. 94). A disruption or a substantial change in one node of these networks can have wide-scale consequences for other nodes. Hence, sensitivity to dyadic or third-country disruptions in trade is potentially much higher in such a setting than before.

The second aspect of interdependence as conceptualized by Keohane & Nye (1977) is vulnerability: the relative availability, and cost of the alternatives in case a certain interdependent relationship experiences disruption. It is important to examine this aspect in depth, for it is a key concept for this study. On the one hand, contemporary production networks are highly adaptable. Numerous studies have found that international production networks in East Asia remained resilient in the face of the 2008–2009 Global Financial Crisis, the 2011 Great East Japan Earthquake, as well as more recent trade frictions, intra-regional wage pressures, and ‘slowbalization’ (Ando & Kimura, 2012; Obashi & Kimura, 2018). Even in the face of the disruptions in production, and logistics, as well as the rapid shifts in demand brought about by the Covid-19

pandemic, the international production networks proved to be flexible and resilient—in fact, the global trade volume recovered more rapidly in 2020–2021 than after the 2008–2009 crisis (World Trade Organization, 2021, p. 6). Similarly, during the US–China trade frictions, companies and industries under strain moved quickly to find new suppliers, partners, and markets, once their previously established business ties were shattered by political bickering, and the international production networks in East Asia reorganized themselves to manage the disruptions posed by the dramatic shift in US trade policies (Kimura, 2021).

As fragmentation and agglomeration theory suggests, in a densely populated network of firms producing intermediary inputs, the alternatives are abundant, and the increases in costs are mostly marginal. Or, in the words of the WTO (2021, p. 7), “today’s hyper-connected global economy, characterized by deep trade links, has made the world more vulnerable to shocks, but also more resilient to them when they strike.” A liberal interpretation of this phenomenon would yield the notion that production network development and the emergence of GVCs indeed lessen the efficacy of economic coercion, and contrary to weaponized interdependence theory, economic statecraft has not become less costly and more attainable under current circumstances.

On the other hand, the US–China trade war has also shown that the ability to adjust varies greatly, and some inputs are more important and harder to substitute than others. This has been evident in the cases of ZTE and Huawei, two Chinese telecommunications equipment manufacturers, and the flagship firms of the emerging Chinese IT-sector. In the case of ZTE, the US Department of Justice ordered American companies in April 2018 to cease all business ties with the company after it was found to be in breach of US sanctions on Iran, and North Korea. As a result, ZTE had to suspend its operations for weeks, since it could not produce its equipment without American inputs, most importantly US chipsets and software. Although these draconian measures were later rescinded through political negotiations and ZTE could restart its operations, the case has shown that high-technology inputs are hard to replace and prompted Chinese companies to invest further into research and development in cutting-edge technologies to lessen their reliance on the US, and as such, their external vulnerabilities (White, 2018).

Similarly to the ZTE case, US authorities pursued Huawei and its executives partly in connection with the Iran sanctions. From 2019 onwards, the US initiated export controls on Huawei. This led to a severe shortage of microchips, Huawei being unable to use Google’s Android operating system on its smartphones, and tablets and having to

launch an in-house operating system, and the company resorting to sell its server business.³⁶

In many ways, the case of ZTE and Huawei aims to substantiate parts of weaponized interdependence theory. Sanctioning the Chinese companies exerted significant costs on their operations; did not require multilateral support due to the US government being able to utilize chokepoint effects in the technology value chain by exerting influence over companies resident in the US which are dominant in certain segments of the sector; and did not have to encounter ‘black knights’ who might have assisted the sanctioned firms in evading the sanctions.

These examples also substantiate the earlier classic work of Strange (1987, p. 566), who introduced the concept of structural power, which derived from the control of the security structure, the production structure, the financial structure, and the knowledge structure. Updating this to better reflect current times and the peculiarities of East Asia, it can be said that ‘structural power’ is derived from control of the security structure, the regional production structure, the financial structure, the technology structure, and the structure of regional institutionalisation.

This is in line with a long-standing conceptual point regarding the political economy of GVCs, namely that leverage rests with nations which possess technology. From this perspective, the 21st century bargain among leaders and followers on trade (on top of the classic bargain of exchange of market access) is “foreign factories in exchange for domestic reforms,” or to put it more generally, economic, and technological development in exchange for market access and access to low-cost factors of production (e.g., cheap labour). An important implication of this recasting of the basic political deal is that “only nations that possess technology that they are willing to offshore have the leverage to demand the massive domestic reforms” that can result in meaningful further integration. In other words, states with higher technological attainment and a more pronounced ‘headquarter’ (or technology-provider) role in regional production networks are supposed to have more power in influencing regional bargaining (Baldwin R. E., 2011, p. 28). To conceptualise this for the case of present-day East Asia, power stems from the ability to manipulate the main form of regional commerce and the main factor of regional

³⁶ The Huawei case is discussed in more detail in Chapter 5, dealing with the ‘tech war’ between the US and China in the semiconductor manufacturing industry.

welfare: the regional production structure. In turn, influence over the production structure hangs on influence in technology and finance.

On the other hand, the applicability of exploiting technological leverage in international relations is limited by the nature of GVC interdependence, the nature of global capitalism, and political economy constraints.

First, the possession of technology itself is diffuse, and state control over the diffusion of technology is limited. Most advanced technologies are held by private enterprises. One important barrier to state control in this regard stems from fragmentation and specialization. In a world of hyperspecialization, the knowledge required to produce a certain finished product is diffused among many companies, among them parts and components designers, parts and components manufacturers, the manufacturers of specialized machine tools required by parts and components manufacturers, and so on. These pieces of knowledge in turn are usually diffused among companies located in different economies. For this reason, developing fully domestic industries and national production networks is not a viable strategy in advanced technological sectors in the 21st century (Milberg, Jiang, & Gereffi, 2014, pp. 170–171). This also means that exercising control over a whole value chain is in most cases not realistic for any state actor without multilateral support.

Another, related barrier is that most economies possess heterogenous strengths and weaknesses among sectors related to domestic technological attainment. A certain economy might be adept at producing certain technologies, but at the same time might be heavily dependent on foreign inputs in another due to specialization, and comparative advantages. Chinese companies are very influential in most upstream industrial sectors, such as the manufacturing of basic chemicals, but are less productive when it comes to more advanced applications of these chemicals, such as in the pharmaceutical industry. Similarly, Japanese companies are global leaders in the auto industry, but Japan lags far behind other Asian nations in producing high-tech electronics parts and components, such as state-of-the-art microchips.

In summary, national control over GVCs and IPNs will differ considerably between different production stages and sectors. This means that contemporary GVC interdependence is problematic to capture in fine detail based on aggregate measures. However, this point does not negate the validity of weaponized interdependence theory. On the contrary, this means that WI is indeed a better framework for the understanding

of GVC interdependence than traditional liberal theories, for it focuses on the areas where states do possess systemic economic advantages *vis-à-vis* their adversaries.

Moreover, while technological prowess is an undoubtedly important element of economic power in the contemporary global economy, more traditional forms of economic coercion still persist. Above all else, possessing a large market for foreign goods gives a state leverage over economies which are reliant on income realized through selling goods on said market (Hirschmann, 1945; Strange, 1987). The recent years have seen an increase in the utilization of market power, especially by China, which instituted import restrictions on products from Australia, the Philippines, and most recently Lithuania due to political disputes with these countries (Smyth, 2021; Luo, Sun, & Wan, 2020).

Market power is especially important for East Asian economies, for which export income represents a considerable share of national income. Traditionally, East Asian trade followed the pattern of ‘triangle-trade:’ Japan exported high-technology intermediate products to China and the ASEAN, where factories combined Japanese inputs with local labor and locally produced lower value-added parts and components and assembled these into finished products, which were exported predominantly to the United States and Europe, and to a lesser degree to intra-regional states for consumption. This sort of trade structure has changed substantially, as detailed in Chapter 2: instead of the classic triangle, the structure of regional trade now reflects complex, multi-country interdependencies. Similarly, the weight of key markets for final products have shifted: the reliance of East Asia’s regional production networks on extra-regional demand has decreased due to the rise in intra-regional consumption as a result of the fast growth rates of regional economies. At the same time, the share of external demand remains very considerable: in terms of final products, East Asia consumes only around a third of its production.

To invoke once more the classic work of Kindleberger (1973), an integral element of power and leadership in international politics is the ability to act as a stabilizing force in international commerce by absorbing the production of other states. Traditionally, this stabilizing element has been provided by extra-regional actors, most importantly by the United States. If and how this has changed with the rise of China will be surveyed in detail in the coming sections.

Moreover, as the Huawei case shows, considerations related to a loss of export income are substantial even for the US, which arguably has limited export dependence.

One explanation for this is that political economy considerations are very clearly at play in contemporary frictions regarding the control of technology and economic coercion through chokepoint effects in technology. Even after sanctioning Huawei and other Chinese manufacturers, the US Commerce Department issued over three hundred licenses for the provision of US technologies, parts, and components to major Chinese firms in the period between November 2020 and April 2021, amounting to an export value of over US\$100 billion (Freifeld & Alper, 2021). This shows that the domestic costs of the restrictions put on Huawei are far from negligible, and US companies are actively engaging in the weakening of the export restrictions to reduce the costs incurred by them.

4.1.2 Approaches to quantifying interdependence

When dealing with interdependence and material sources of power in international relations, most of the existing literature resorts to quantitative, gross measures of capabilities, or in other words, aggregated data on the national level. A prime example of this is the widely used National Material Capabilities dataset, which looks at six indicators, namely military expenditure, military personnel, energy consumption, iron and steel production, urban population, and total population, as anchors of national power (Singer, Bremer, & Stuckley, 1972).

The situation is similar in the case of studies on the relationships between interdependence and interstate conflict. Traditional interdependence research, which focuses on the statistical relationship between the strength of economic ties and the incidence of militarized interstate conflict through large-N sample studies on the dyadic and monadic level, usually operationalizes interdependence as gross bilateral trade, or in some cases, as gross dyadic trade as a share of total trade or as a share of GDP (Polachek, Robst, & Chang, 1999; Oneal & Russett, 1999; Goldsmith, 2007).

These approaches are not appropriate for the aims of this dissertation. First, this study does not aim to make inferences about the systemic effect of interdependence on interstate conflict, but about the political power and leverage stemming from the economic hierarchies embedded in international production, and the use of such leverage within the context of the US–China strategic rivalry. Second, the operationalization of interdependence in these studies is rather diverse and dated. Although most of the research measures interdependence as a factor of trade, the specifics of operationalization

vary greatly. Some studies focus on trade share (bilateral trade relative to total trade), others measure economy-trade share (bilateral trade as a component of GDP), and still others focus on either exports or imports exclusively, either as a share of total exports/imports or GDP. Different approaches measure different things, of course, and consensus has proven to be elusive on the right approach to follow. The case is similar when it comes not only to the depth, but the breadth of data used in traditional interdependence research: while important, trade in itself is an inadequate measure to capture the complex way in which national economies are intertwined in the current era.

More recent operationalizations include the Atlantic Council's Formal Bilateral Influence Capacity Index (FBIC), which aims to measure US and Chinese influence in the world (Moyer, Meisel, Matthews, Bohl, & Burrows, 2021). The economic part of the index is based on gross bilateral goods trade as a percentage of total trade, gross bilateral goods trade as a percentage of GDP, and the gross value of bilateral aid as a percentage of total aid and the GDP of the recipient country. As detailed in the introduction and the previous chapters, such an approach does little to capture the full depth of trade dependence.

Another recent project by Beckley (2018) aimed to provide a quantifiable and modern measure of state power in international relations. Beckley argues that a fundamental problem of previous attempts at such measurement, such as the National Material Capabilities data, is that, as noted earlier, most of these indices use gross indices of economic and military indicators, which, among other shortcomings, overstate the importance of populous but poor countries, even though such countries face serious constraints on using their aggregate resources for power projection abroad. To overcome these shortcomings, Beckley proposes a measure of net resources, which he simplifies by multiplying a state's GDP with its GDP per capita so that the gross resources of states are effectively weighted by their relative levels of development. He proceeds to measure the dyadic balance of net resources as a nation's share of the sum of the two sides' GDP x GDP per capita and empirically tests that this measure provides better explanatory value in the analysis of previous great power rivalries than gross indices (Beckley, 2018, pp. 21, 41). Although such an approach might be appropriate for the measurement of resources and capabilities in historical cases of power competition, simply weighting the GDP of a state with its GDP per capita does not reflect the peculiarities of production network interdependence.

Researchers working in other fields have produced more data-driven studies on the economic interdependence among nations, albeit from a different perspective. As noted in the previous sections, economics and IPE research have unearthed many fundamental features of the structure and development of GVCs either by analysing finely disaggregated trade data on the product level, and focusing on the international trade in intermediary inputs, mostly machinery parts and components, or by utilizing input-output data to discern connections between country-industries. While such research generally does not concern itself with the international politics of GVCs, the methodology and findings of this literature is essential for the understanding of the power relations entailed in economic strengths and weaknesses. Hence, the empirical sections of my analysis will rely heavily on the methods of GVC research.

Another strand of the economics and political economy literature aimed to empirically dissect the material elements of regional leadership and regional power through measuring the economic the regional and global economic hubness and centrality of emerging powers (Destradi & Gundlach, 2014; Chen & De Lombaerde, Testing the relationships between globalization, regionalization and the regional hubness of the BRICs, 2014). This strand of research combines the aforementioned quantitative approaches to interdependence with methods of network science to provide a systemic, rather than dyadic view of market power and trade dependence.

Additionally, economists dealing with the international effects of financial interdependence produced more detailed studies exploring the relative financial wealth and international financial power of states, while other surveyed the diffusion of financial risk, financial market interdependence, the global transmission of national monetary policies (Miranda-Agrippino, Nenova, & Rey, 2020; Lane & Milesi-Ferretti, 2018; Armijo, Mühlich, & Tirone, 2014; Li, Zhang, & Willet, 2012).

The empirical investigation presented in the rest of this chapter will rest partly on insight from this heterogeneous literature on interdependence. However, the focus of the following empirical analysis will differ from previous research in IR and economics, for I aim to measure the potential for economic coercion in production network-based interdependence. To this end, I first survey quantitative measures of influence within regional trade and production networks, and investigate the ‘centrality’ of China, Japan, and the ASEAN-6, as well as two important extra-regional GVC hubs, the United States and the European Union. I then turn to measures of export sophistication to get a comparative picture of the relative technological attainment of regional economies. In the

final part of the next section, I look at the financial power of regional states based on their net financial positions *vis-à-vis* other regional states. I also discuss briefly the increasing lending and investment activity of China to put it into comparative perspective.

In the second empirical section, I investigate measures of production interdependence in East Asia and beyond. The focus will be on unearthing both the quantitative and the qualitative position of regional economies within IPNs and GVCs based on input-output data and value-added data. In the latter part of the section, I turn to compute sensitivities in the sense of Keohane, & Nye (1977) from input-output data and compute the main sensitivities, and dependencies of China, and the US. Based on this data, I then propose a quantitatively weighted measure for regional influence to better reflect the particular aspects of GVC- and IPN-interdependence in East Asia, combining financial and trade centrality with sophistication and GVC position.

4.2 Traditional measures of trade centrality and export sophistication

4.2.1 Centrality and hubness in East Asian trade

To put the discussion of the previous section into a measurable framework, I will rely in part on previously conceptualized indices, as well as some indigenous new methods to quantify trade, investment, and production relations in East Asia.

First, I look at some traditional aspects of interdependence and relative power. Two simple methods of calculation regional centrality, the hubness measure and the intra-regional centrality index will be computed, as operationalized by Chen and De Lombaerde (2014, p. S120–121). The intra-regional centrality index is the sum of bilateral trade between country i and the rest of the region, as a share of the total intra-regional trade:

$$IC_{i \in r} = \frac{\sum_{j \in r, j \neq i} T_{i,j}}{T_{intra_r}}$$

The hubness measure represents the relative share of market dependence among a country and its region, and is defined as the following:

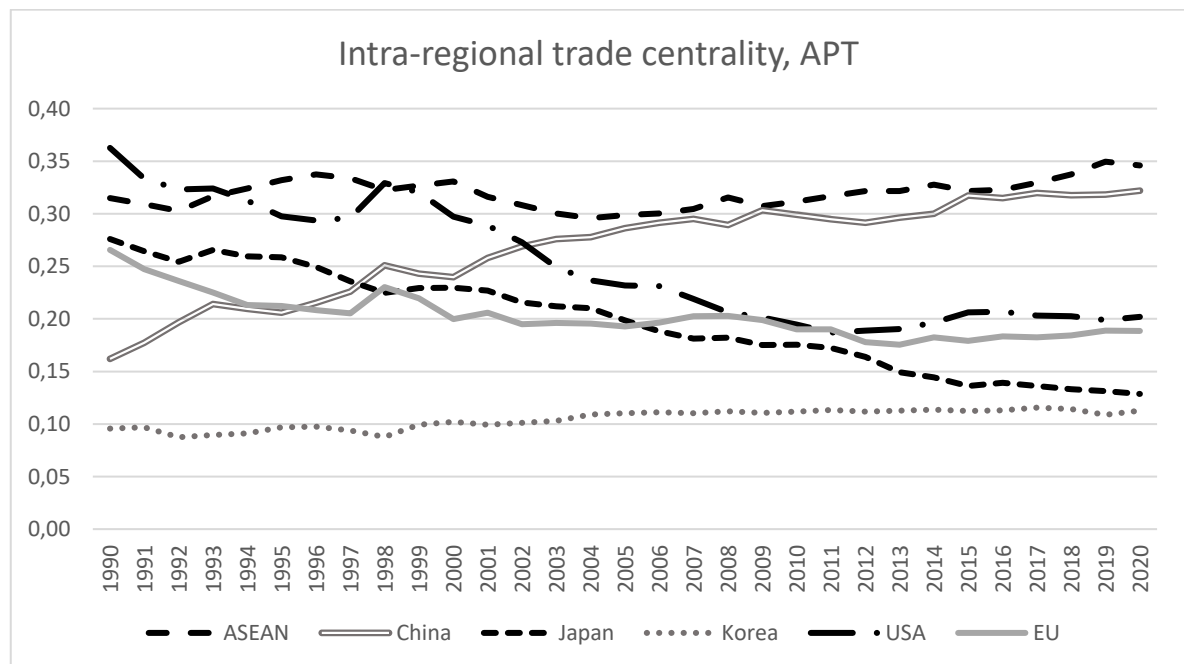
$$HM_{AB} = EX_{AB}^* (1 - IM_{AB})$$

where HM_{AB} measures the hubness of country B from country A's perspective; EX_{AB}^* represents A's exports to B as the share of its total exports; and IM_{AB} represents B's imports from A as a share of its total imports. The value ranges from 0 to 1, with the

higher number representing deeper interdependence (Chen & De Lombaerde, 2014, p. S121). The regions used for the measurements are the APT and the ASEAN+6.

This computation is shown in the following figure. As expected, intra-regional trade centrality shows that China has become the most important source of trade for regional countries, whereas the relative trade centrality of Japan is steadily declining, and South Korea's is stagnating. In the case of trade centrality, China's 'rise' occurred between 1990 and 2007. The country was already at the center of regional trade networks the first years of the millennium, when China's trade and its GDP were much more meagre in international comparison than it is today. The centrality figures also show that the ASEAN's share of intra-regional trade remains the highest in the APT. The ASEAN's share shows a mild decline in the late-1990s and early 2000s, the time when China's trade share boomed, suggesting that trade shifted to China in this period. However, the ASEAN shows a steady rise in centrality after 2008. Thus, in the period since the 2008–2009 Global Financial Crisis, Japan's centrality continued to steadily erode, while the ASEAN's and China's grew further.

Figure 8. Intra-regional trade centrality in the APT.



Source: Calculations based on data from the ADBi integration indicators database.

As for the centrality of the EU and the US *vis-à-vis* the APT, the pattern is similar to that of Japan's, meaning a steady loss of centrality for the whole period.³⁷ However,

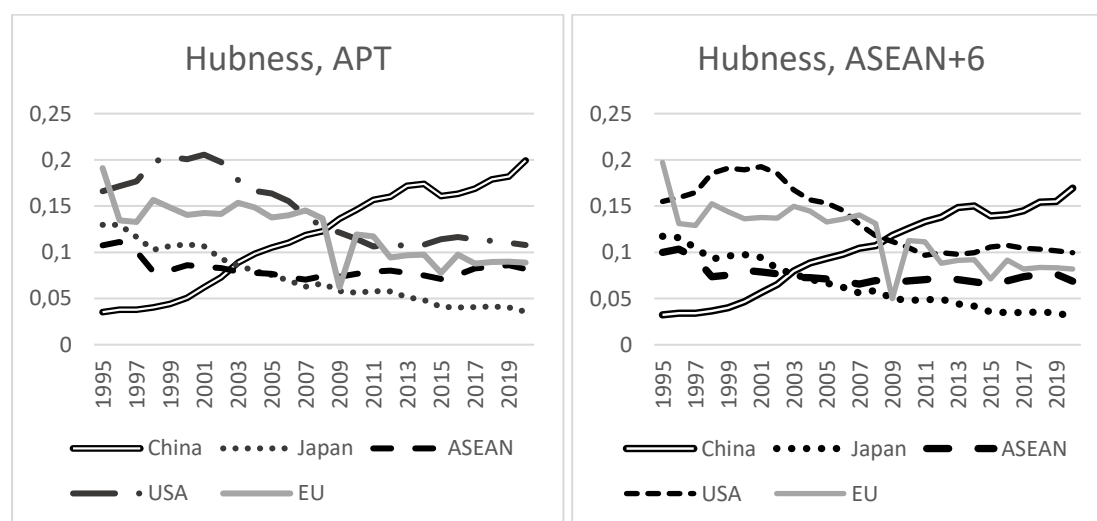
³⁷ In the calculation for the trade centrality of the US and the EU *vis-à-vis* the APT, the region used in the denominator was the APT plus the US, and the EU, respectively. Similarly, in the following

the relative pace of decline is much sharper for the US than for the EU. Moreover, it should be noted that the EU's and US' centrality remained stagnant after 2011,

Hubness relative to the ASEAN-6 shows an even more pronounced rise in China's influence. In the following chart, I have included extra-regional economies for context. The reason for this is that the hubness measure constructed here is a dyadic measure. While it might be computed for every actor in the region, from the perspective of East Asian regionalism, ASEAN provides the best vantage point. However, computing the hubness measure for the ASEAN only *vis-à-vis* Northeast Asian trade partners would not tell us anything important, apart from China being by far the most important source of trade.

In this setting, China's rising and Japan's declining trade share is similarly obvious, but it is also clear that even though extra-regional dependencies had declined substantially between 2000 and 2009, they have remained steady and sizeable since 2010. The combined hubness of the EU and the US in trade with East Asia is still stronger than that of China, albeit only slightly.

Figure 9. Hubness in the APT and the ASEAN+6.



Source: Calculations based on data from the IMF Directions of Trade database.

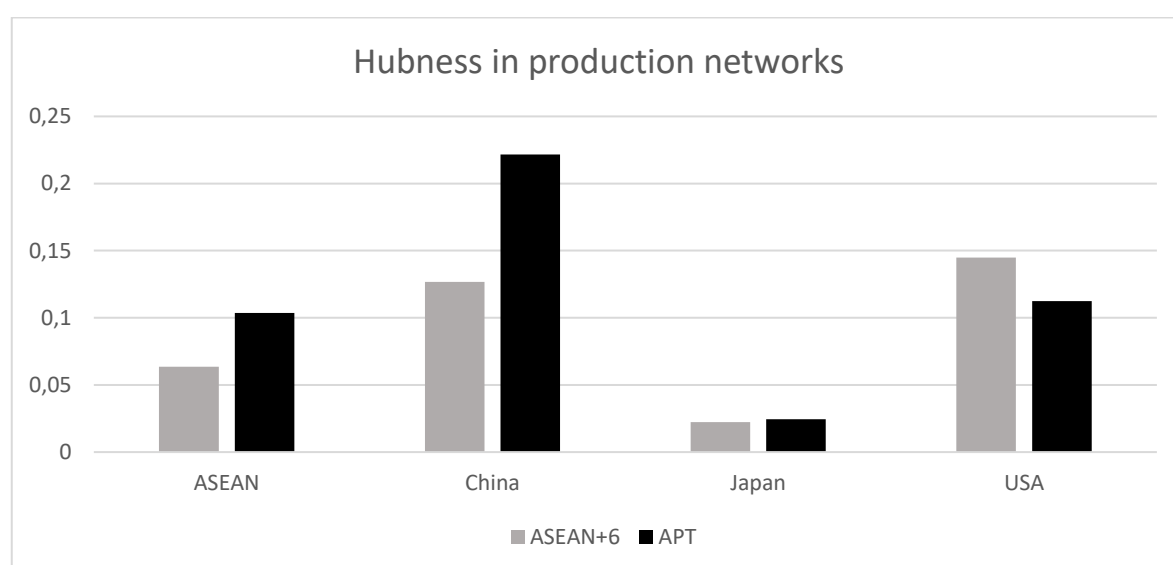
Additionally, the hubness measure was developed further to fit the conceptualisation of the nature of production network interdependence in East Asia. To this end, I use disaggregated trade data on the HS4 level. I select the most traded manufactures commodities by East Asian nations based on data from ASEAN official statistics (ASEAN, 2018), which are presented in Appendix I. As expected, all of these

calculations for hubness, the US and EU shares were based on extended regions, for the calculations would not make sense otherwise.

commodities are intermediary inputs in electronics, auto and machinery manufacturing, signifying the importance of the production logic of regional trade networks, as well as the reliance of machinery manufacturing within the region. I computed the hubness measure based only on these commodities to investigate the centrality within regional production networks for the APT and the ASEAN+6 groups. This shows us a crude measure of how embedded each country is within these networks. The results are presented in the following figure.

In line with the previous findings, hubness based on the most important regional product categories shows China's pivotal role in East Asian production. Within the APT production networks, China's hubness is far higher than the ASEAN's and any other regional or extra-regional state when looking at gross trade data. In the case of the ASEAN+6, China's hubness is reduced considerably, signifying the weakness of trade ties between China and India. However, as India opted to leave the ASEAN+6 framework, the political relevance of this grouping has decreased significantly.

Figure 10. Hubness in production networks in 2016.



Source: Calculations based on data from the UN COMTRADE database.

4.2.2 Measures of export sophistication

Given the shortcoming of centrality and hubness when it comes to capturing differences in technological attainment, in this section I look at some qualitative measures of trade. The aim of this section is to make inferences about the relative positions of regional countries within production networks based on different measures of export sophistication. I employ three different identification strategies to this end.

4.2.2.1 Revealed comparative advantages

The first one of these three examines the export sophistication of a country through the Sophistication of Exports (EXPY) variable as defined by The World Bank. This variable is an estimation of the technological sophistication embodied in a country's export portfolio. It is calculated by first calculating the product technological sophistication index (PRODY) variable, which is a weighted average of per capita GDP of countries producing a certain product, with weights derived from revealed comparative advantage. In turn, the revealed comparative advantage (RCA) index is a measure of a country's relative advantage or disadvantage in a specific industry as evidenced by trade flows, which was first used by Balassa (1965). It is calculated as follows:

$$RCA_{ijk} = \frac{\frac{x_{ik}}{X_i}}{\frac{x_{wk}}{X_w}}$$

From this index, PRODY can be calculated as follows:

$$PRODY_k = \sum_i \frac{\frac{x_{ik}}{X_i}}{\frac{x_{wk}}{X_w}} * y_i$$

From the PRODY variable, the expected export sophistication index can be computed, which is an estimation of the country's expected GDP per capita, based on its export portfolio in comparison with other countries. The index can be written down as this:

$$EXPY_i = \sum_k \frac{X_{ik}}{X_i} * PRODY_k$$

All of these variables have shortcomings. The RCA value is based on the idea that trade flows are reflections of underlying comparative advantages between economies. While this might be true in a world of completely free and frictionless trade, these conditions do not apply to the current reality. Moreover, contemporary GVC trade skews the RCA classification significantly. For example, 44 percent of China's exports are categorized as high-technology products, while the same ratio for Japan is 36 percent based on the CHELEM classification. This does not mean that China is a technologically more advanced economy than Japan, but merely that China is home to many electronics factories which assemble high-tech components and end-products, a large part of the value-added of which originates outside of China. Nevertheless, even with these

limitations, RCA values contain valuable information about which sectors certain countries specialize in, an issue more than relevant for the study of power relations embedded in regional production networks.

In addition, it must be highlighted that in this form, both PRODY and EXPY maybe skewed. As described by the World Bank (2013b), “PRODY values for a product can be skewed upwards simply because high income countries produce them, for example agricultural products have higher prices in high-income countries relative to the same products in low-income countries. Furthermore, sophisticated products such as computers may have relatively low PRODY values because they are assembled in and ultimately exported from low-income countries. EXPY does not account for quality, and so overestimates the importance of sophisticated products from low-income countries. EXPY also may be skewed by labor-intensive assembly of high-tech products performed in low-wage countries.”

Data for RCA calculations was obtained from the CHELEM database (De Saint-Vaulry, 2008), and from the Asian Development Bank’s MRIO. The data in CHELEM are based on gross trade values which are disaggregated based on the technological sophistication of the traded products, and the production stage of the exported products. Technological sophistication is divided into four groups: high-tech, intermediate-to-high-tech; intermediate-to-low-tech; and low-tech products.³⁸ Production stages are divided into six categories, namely: primary; basic manufacturing; intermediate goods; equipment goods; mixed products; and consumption goods.

The CHELEM database also contains data on the changes of the global market shares of countries by technological levels, and production stages, which are also important indicators of the strengths and weaknesses of certain economies.³⁹ The ADB MRIO data is based on a combination of trade and IO data following the methodology of Borin & Mancini (2019). In the ADB data, the RCA is calculated from three perspectives:

³⁸ High-technology products are: medical and precision instruments, pharmaceuticals, radio, TV and communication, office, accounting & computing, aircraft and spacecraft. Medium-high-technology products are: railroad & other transport equipment, motor vehicles, trailers, other electrical machines & apparatus, machinery and equipment n.e.c., chemicals excluding pharmaceuticals. Medium-low-technology products are: rubber and plastic products, ships and boats, basic & cast non-ferrous metals, other non-metallic mineral products, manufacturing n.e.c. & recycled products, fabricated metal products, except machinery, basic & cast iron and steel, coke, refined petroleum products, nuclear fuel. Low-technology products are paper and printed products, textiles, leather and footwear, food products, beverages & tobacco, wood & wood products excluding furniture; straw.

³⁹ The glossary and full classifications of CHELEM can be accessed at: http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=17.

based on exports, based on value-added in bilateral exports, and based on value added by the country-sector of origin. This dissection is useful for the comparison of differences among the three approaches and for the illustration of differences in value-added and gross trade-based indices. For the sake of readability, the detailed RCA and market position data is presented in Appendix II.

The RCA values show that first, the revealed comparative advantages of East Asian economies are heterogenous: based on their export portfolio, regional states are specialized in many sectors. It also shows that even though China's technological catching-up process and its improving position in GVCs has garnered a lot of attention, China's comparative advantages still predominantly lie in mid-level and low-level manufacturing instead of high-technology products. It is also clear from the data that when it comes to services, East Asian economies, even high-income ones, are lagging behind the United States and the European Union.

According to the CHELEM data based on the technological level of exports, China has a weak but positive RCA on all technological levels. The changes in China's RCA values show that the country is rapidly becoming more competitive in intermediate-to-high-technology products but is stagnating in high-technology product groups. Moreover, China's comparative advantage in low-tech production has been on the decline since 2007, which shows that China is indeed shedding low-tech manufacturing. A slightly surprising finding is that the ASEAN has high RCA values for both high- and low-tech exports, but negative values for intermediate-high and intermediate-to-low technology sectors. This has to do with the heterogeneity of the membership: while some ASEAN countries are specializing in the manufacturing and assembly of high-tech products, others such as Cambodia, and Laos are at the lowest ends of the technological ladder.

Another interesting finding is that Japan, and South Korea (as well as the European Union) have the highest RCA values for intermediate-to-high-technology exports. South Korea, however, also has a strong positive value for high-tech exports, whereas Japan, the EU, and the US are weaker in this regard. This shows both the limitations, and the value of the RCA calculations: while Japan, the EU, and the US continue to be important sources of high-technology inputs, on a purely quantitative basis, they are less important nodes in high-tech manufacturing networks.

Market position data based on technological levels is largely similar to that of RCA data, although the longitudinal dynamics differ somewhat. The ASEAN has a fairly

stagnant market share in all areas, whereas China's market shares show a steady climb between the late 1990s and the early 2010s, and then a slight decrease afterwards, except for the intermediate-to-high-tech products, where its share continues to expand. The data also shows that China's market share is still the highest in low-tech and intermediate-to-low-tech manufacturing products and is in fact decreasing in high-tech products. Japan's market share in high-tech and intermediate-to-high-tech exports had been eroding up until the mid-2010s, when it started to stagnate. Interestingly, Japan's share in low-tech manufacturing is expanding, which means that the country's terms of trade show negative developments. South Korea, on the other hand, experienced a rapid expansion in global market share in all areas except low-tech, where its market share has dropped substantially over the past three decades, as expected. Nevertheless, most of South Korea's increase happened before the 2010s, and its market shares have been steady or slightly worsening in the last decade.

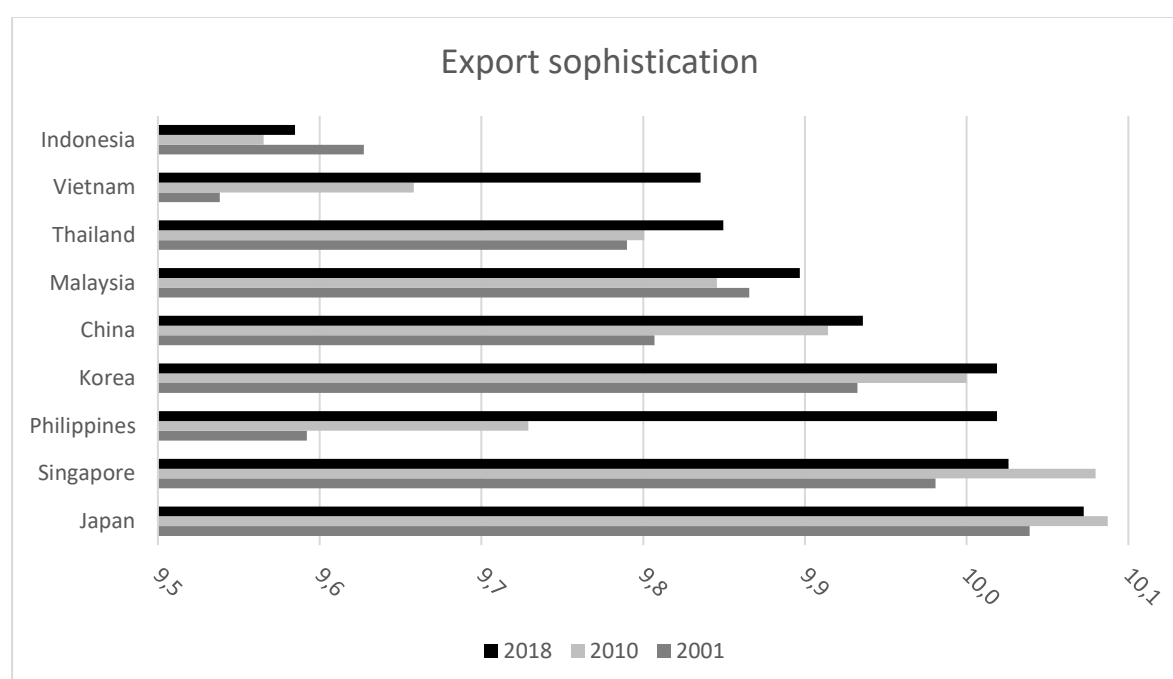
In the CHELEM data based on production stages, the ASEAN, and China have a higher comparative advantage in the export of consumption goods, which reflects that these economies host a large number of final assembly operations. Most economies surveyed except Brunei have a below-zero RCA for primary goods, which is expected given their development levels and resource endowments. China, and Japan have a high RCA value for equipment goods, whereas Japan, and South Korea also excel in the export of intermediate goods. In terms of market position, the ASEAN mostly excels in the export of consumption goods, while China has the highest market share in equipment goods. South Korea has a pronounced market share in intermediate products. Apart from the aforementioned, the in-country variation between the relative market shares of goods based on production stages is limited.

The value-added based RCA values derived from the ADB MRIO confirms the CHELEM data in many ways. In 2019, the latest year for which data are available, South Korea, and Japan had a high RCA in medium- to high-technology manufacturing based on the origin of value-added; while China had a high RCA in low-technology manufacturing. Most ASEAN countries' strengths lied either in low- or medium-technology manufacturing, which shows that on a value-added basis, Southeast Asia's comparative advantage in high-technology manufacturing is much weaker. For developed economies, the RCA based on the value-added by the sector of origin is much higher than the trade-based RCA, whereas in the case of emerging economies, the trade-

based RCA is usually higher in manufacturing, which is to be expected given the nature of regional production networks.

The EXPY figures show that Japan, and Singapore have the highest sophistication of exports in the region. A surprising finding of the EXPY values is the relatively high export sophistication of the Philippines, which is usually not considered to be among the industrial powerhouses of the region. This means that although its domestic value-added is limited, the Philippines is an important hub for high-technology exports.

Figure 11. Log expected GDP as measured by EXPY.



Source: WITS.

As expected, China is well behind the leaders on the technological ladder, although it has already managed to overtake Thailand, and Malaysia by 2018. It is also noteworthy that while China's export sophistication grew rapidly between 2001 and 2010, the pace of rise is considerably weaker between 2010 and 2018. It is also noteworthy that apart from the Philippines, Vietnam has also produced a meteoric rise in export sophistication over the past two decades, which is a sign of the growing importance of Vietnamese assembly lines in regional production.

Another way to look at EXPY data is to compare the expected GDP per capita based on export sophistication with the actual GDP per capita on a purchase parity basis.

This approach shows which countries are ‘overperforming’ their economic development level in their exports.⁴⁰

As the data shows, developed countries are underperforming their GDP per capita in their export sophistication, although this is expected given the fact that almost no country produces purely high-technology exports, and as a country develops, its export sophistication usually falls behind its GDP per capita. This is evident in the case of China, where the expected GDP per capita based on export sophistication used to be much higher than the actual GDP per capita. The gap, however, has narrowed steadily and considerably since the 1990s. The same is the case for Thailand, Indonesia, Malaysia, and Thailand. The Philippines is an outlier in this regard is well.

Table 19. Difference between log GDP per capita (PPP) and EXPY.

	1990	1994	1998	2002	2006	2010	2014	2018
Brunei		-1,82	-1,72	-1,60	-1,61	-1,57	-1,51	-1,45
Cambodia				1,72	1,18	0,96	0,96	1,02
China		1,98	1,70	1,53	1,18	0,83	0,54	0,32
Germany	-0,34	-0,39	-0,44	-0,64	-0,68	-0,70	-0,78	-0,84
Indonesia	1,03	0,87	0,93	0,92	0,74	0,54	0,39	0,25
Japan	-0,34	-0,35	-0,38	-0,43	-0,48	-0,44	-0,49	-0,55
Korea	0,49	0,25	0,15	-0,17	-0,28	-0,39	-0,44	-0,57
Malaysia	0,33	0,19	0,17	0,17	-0,02	-0,08	-0,19	-0,33
Myanmar						1,21	0,99	0,92
Philippines			1,13	1,19	1,28	1,08	0,99	1,02
Singapore	-0,58	-0,77	-0,77	-0,92	-1,19	-1,19	-1,28	-1,45
Thailand	0,79	0,62	0,70	0,52	0,36	0,23	0,16	0,05
USA		-0,57	-0,65	-0,81	-0,90	-0,90	-0,98	-1,05
Vietnam				1,41	1,22	1,12	1,02	0,90

Source: WITS.

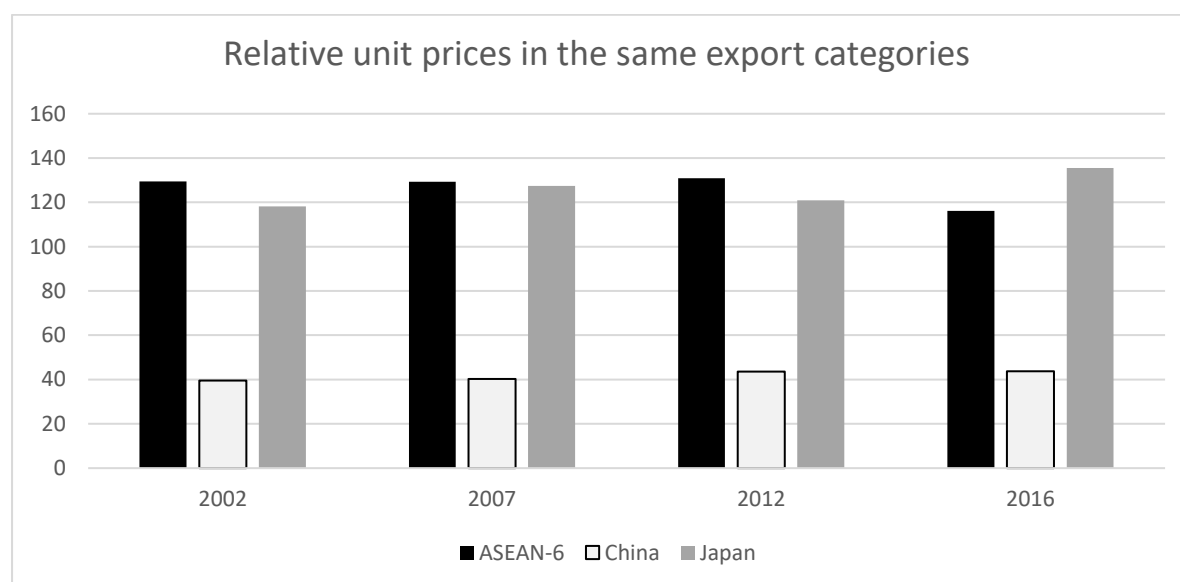
4.2.2.2 Differences in unit export prices

The second measure I employ in this study involves computing the relative differences in the unit prices of exported and imported inputs in the same product categories. In practice, this means that I calculate the mean unit value of goods imported in a certain product category, then I calculate the mean unit value of goods exported in the same product category, then I calculate the difference of the two values. I then compare these values among regional countries. Apart from the difference between exports and imports, I also calculate the regional positions solely in export unit values. The data for the unit value is obtained from Berthou & Emlinger (2011).

⁴⁰ In the data for the difference between EXPY and log GDP per capita, Germany and the US are included as benchmark examples of developed economies exporting mostly higher value-added products.

The logic behind this calculation is to discern the producers and users of high-technology products and examine the technological dependencies in manufacturing among countries. The assumption is that within the same product category, higher unit price represents higher technological sophistication: for example, the various sub-components of microprocessor chips have very different values, and one would expect that the countries producing the cheaper sub-components to be technologically less developed, while those producing the more expensive ones to be more developed. A similar method was used among others by the European Commission (2021a, p. 27) in their analysis of the EU's trade vulnerabilities, based on the assumption that the higher the price differences, either positive or negative, the more difficult it is to substitute foreign goods with domestic goods even if internal capacity is available.

Figure 12. Relative unit price differences among the ASEAN, China and Japan.



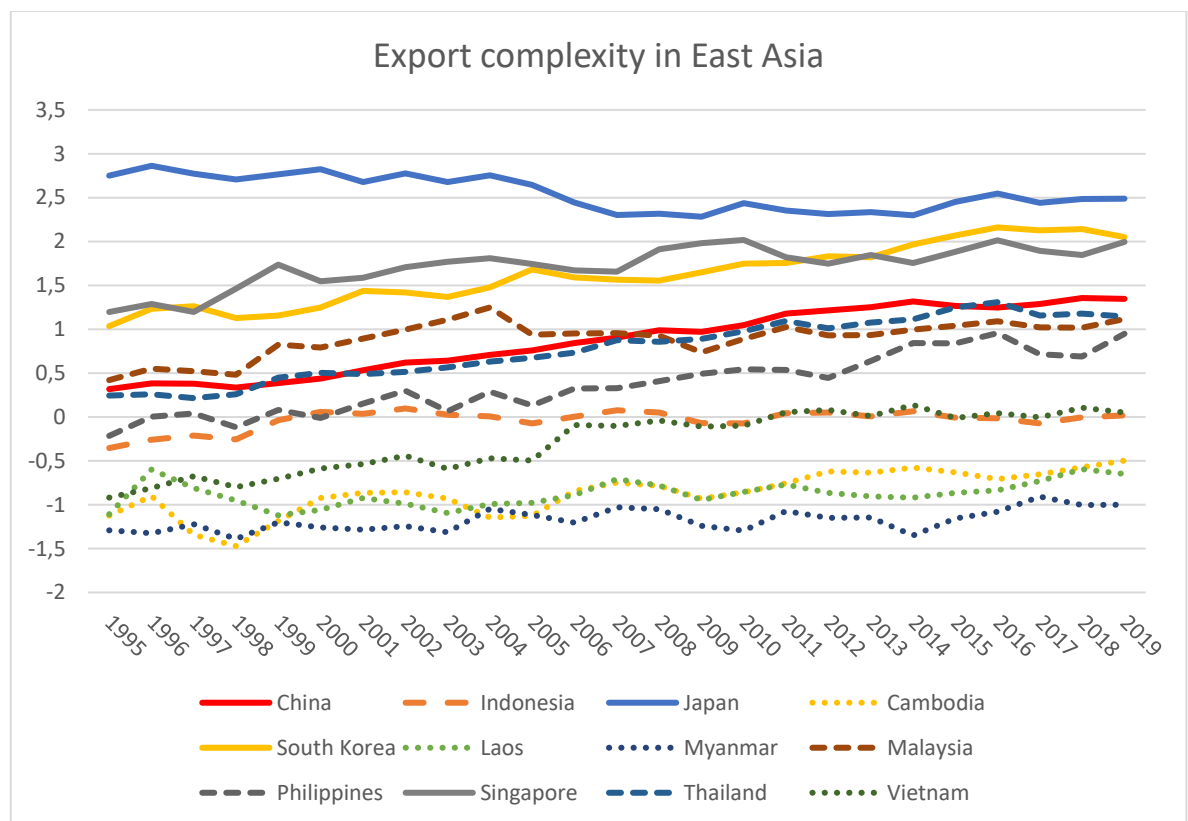
Source: Calculations based on UN COMTRADE, and Berthou & Emlinger (2011)..

Nevertheless, as the figure above shows, such a comparison does not appear to validate other observations on the relative technological capabilities of the machinery industries in East Asian countries. While it is unsurprising that China's export values are low, ASEAN's mean unit export values are higher than Japan's, which when contrasted with other economic evidence, suggests that this method is not suitable for investigating the relative technological capabilities of different economies.

A further measure of export sophistication was computed by Hausmann, et al. (2014), which investigates export complexity based on the number and uniqueness of product categories exported by a country. The larger the number of product categories exported, and the more unique an exports portfolio is, the higher the sophistication index.

Uniqueness is determined based on how many other countries produce and export certain product categories. Data from this measure for East Asian economies is presented in the following chart. It shows that Japan by far has the most sophisticated export portfolio in the region, although South Korea and Singapore are catching up as well. While the sophistication of Chinese exports is considerably lower, China has also been catching up and has overtaken countries such as Malaysia and Thailand, which started their industrialization earlier and in a more conducive business environment.

Figure 13. Export complexity in East Asia.



Source: Hausmann, et al. (2014).

It is also apparent from the chart the importance of the Philippines and Vietnam as manufacturing hubs is increasing, since they export an increasingly sophisticated portfolio of products. Nevertheless, this measure ranks the Philippines notably lower than EXPY. It is also clear that Indonesia, while the most populous nation of ASEAN, is also the most laggard economy when it comes to industrial catching up based on complexity measures.

In summary, the measures consulted here to investigate the technological sophistication of regional countries have demonstrated that China remains far from the technological frontier in manufacturing industries as a whole, despite allocating

considerable resources toward high-technology manufacturing. While Japan's relevance in gross measures of centrality and hubness has declined rapidly, the country is still among the leaders in East Asia when it comes to technological sophistication, and as expected, South Korea has been rapidly rising based on this variable.

There is considerable heterogeneity among ASEAN member states, some of which are falling behind China in terms of export complexity and sophistication. This phenomenon reflects an important aspect of the East Asian international political economy discussed above, namely that emerging economies have to compete with China for investment and manufacturing, yet this competition is very asymmetrical.

4.3 Financial clout

As noted above, financial investment has always been a particularly significant element of economic power in contemporary international politics. Earlier theories such as Kindleberger, Strange, or Organski put much emphasis on the fact that control over the international financial system provides great powers with even greater leverage. Moreover, the recent sanctions literature and the weaponized interdependence framework also discusses in detail how the US exerts political power through its control over the main hubs of the contemporary international financial networks.

Another reason to investigate financial ties stems from the empirical findings presented in Chapter 3. As the results of the regression model in section 3.3 have shown, FDI is one of the main explanatory variables of GVC participation in East Asia. This means that FDI providers have an added layer of leverage over FDI recipients, for the former structure how the latter are integrated into GVCs and regional production networks.

It should be noted that financial power and financial interdependence is a multifaceted phenomenon in the heavily financialized contemporary world economy, which could take many shapes and forms ranging from stock market interdependence to the international transmission of monetary policies, and currency politics. For the reason above, I will focus here on one aspect, direct investments, since this facet of finance is the one most heavily tied to the topic of this dissertation.

4.3.1 Investment positions

The following table shows the net international investment position of regional states based on Lane, & Milesi-Ferretti (2018). Net international investment position is the sum of all foreign portfolio equities, debt instruments, and direct investments held by

nationals of a country, minus the sum of all the foreign portfolio investment, debt, and direct investment held by foreign entities in the domestic economy. A positive value shows that investors from a certain state have more wealth abroad than foreigners in that state, signifying that the state is a net investor in international finance.⁴¹

Table 20. Net international investment position of East Asian economies in US\$ billion.

	1996	2000	2005	2010	2015	2020
Brunei Darussalam	31	32	39	53	68	81
Cambodia	-1	-1	-1	-1	-17	-24
China	-73	45	381	1 423	1 640	2 026
Indonesia	-139	-129	-126	-294	-378	-280
Japan	890	1 152	1 523	3 115	2 689	3 397
Korea	-59	-42	-144	-133	200	460
Laos	-2	-3	-3	-8	-16	-26
Malaysia	-59	-31	-19	2	24	14
Myanmar	-7	-8	-8	-4	-10	-37
Philippines	-39	-44	-42	-35	-33	-28
Singapore	71	145	340	513	646	1 046
Taiwan	164	189	339	631	1 075	1 366
Thailand	-93	-60	-55	-46	-48	44
Vietnam	-18	-19	-26	-83	-115	-141
Hong Kong	56	226	458	677	1 003	2 153
China, HK, Macao	-11	280	859	2 134	2 705	4 289

Source: Lane & Milesi-Ferretti (2018).

Net international investment position is an important gauge of a state's position within the global financial system, albeit not necessarily a reflection of financial power in itself. The United States, for example, has a negative net investment position, which is a reflection of the fact that the US is a large and heavily financialized market, in which numerous foreign firms and individuals invest or provide credit. On the other hand, Afghanistan had a positive IIP in 2020, which is not a testament to its strength of financial power, but to the fact that hardly any foreign investor would enter a risky market such as Afghanistan, whereas many Afghan nationals would invest their money abroad so that it remains safe.

The following two tables show the absolute value of foreign financial assets of main regional finance hubs and investors, and the value of their foreign assets as a share of the sum of regional foreign assets. The chart shows a time-series view of the data, comparing the dynamics of the absolute and relative levels financial assets for Japan, China, and the ASEAN *vis-à-vis* all economies in the world.

⁴¹ This is of course different from the usual usage of the term net creditor or net debtor used to described countries based on their current account balance.

Table 21. Foreign assets of regional economies in US\$ billion.

	1996	2000	2005	2010	2015	2020
China	145	490	745	2 061	4 302	7 639
Japan	4 363	4 676	6 078	10 016	10 200	14 839
Korea	166	147	262	551	1 082	2 028
Singapore	332	1 174	1 891	3 344	4 338	6 363
Taiwan	206	246	605	1 116	1 968	3 192
Hong Kong	1 719	1 628	2 096	3 783	5 426	7 911
China, HK, Macao	1 866	2 121	2 844	5 870	9 783	15 623

Source: Lane & Milesi-Ferretti (2018).

Table 22. Relative levels of net foreign assets of East Asian economies in all countries in US\$ billions.

	1996	2000	2005	2010	2015	2020
China	2%	6%	6%	9%	15%	17%
Japan	61%	54%	50%	46%	35%	33%
Korea	2%	2%	2%	3%	4%	5%
Singapore	5%	14%	16%	15%	15%	14%
Taiwan	3%	3%	5%	5%	7%	7%
Hong Kong	24%	19%	17%	17%	19%	18%
China, HK, Macao	27%	25%	24%	27%	35%	36%

Source: Calculations based on data from Lane & Milesi-Ferretti (2018).

As the data shows, while Japan was by far the dominant country in financial power before the millennium, Chinese capital outflows have been rising steadily from the late 1990s to the mid-2000s, and have exploded between 2005 and 2009, and then once again in the years leading up to the 2015 Chinese stock market panic. In contrast, the share of the ASEAN has held constant since the late 1990s, signifying that economic growth and increased GVC participation in itself will not lead to an increase in financial clout. The same holds true in the case of South Korea and Taiwan. Foreign assets have been rising steadily as these two economies have become high-income economies. However, their relative financial importance compared to Japan and China, or even offshore finance hubs such as Singapore and Hong Kong, remains far secondary.

The data also shows that Japan's financial clout remains considerable even after three decades of relative decline and that Japan's net foreign assets are still larger than China's, even though the Chinese GDP is around three times as much as the Japanese. If we add up the values for Mainland China, Hong Kong, and Macao, the figure surpassed that of Japan in 2020, however. Moreover, the historical dynamics are very clear from the figure: while Japan remains an important actor in regional and global finance, China's rise is inescapable.

4.3.2 Regional investment positions

While the previous section looked at the total, global investment positions of East Asian economies, for the purposes of this study, it is necessary to tally a more detailed account of regional investment activities. To this end, I gathered and analysed data on bilateral investment positions from the IMF's Coordinated Direct Investment Survey (International Monetary Fund, 2021).⁴²

The picture is very different when surveying only intra-regional positions. First, China is a net recipient of FDI *vis-à-vis* the APT. In 2020, China's direct outward investment position—including Hong Kong and Macao—*vis-à-vis* the APT was US\$228 billion, while its inward position was US\$600 billion.⁴³ In other words, China was more reliant on investment from other regional economies than *vice versa*.

Within the region, Japan had by far the largest direct outward investment position *vis-à-vis* the APT at close to US\$500 billion, followed by Singapore at US\$410 billion. Among the APT plus Taiwan, only four economies had a positive net position *vis-à-vis* the region: Japan, South Korea, Singapore, and Taiwan. Among these economies, Japan had by far the largest net surplus, at US\$430 billion, while South Korea had a US\$108 billion, Singapore, and Taiwan around US\$60 billion positive net position. Coarsely put, these economies are the net investors in the APT from an intra-regional perspective.⁴⁴

Moreover, total intra-regional direct investment in the APT economies amounted to around US\$1.6 trillion in 2020. In comparison, direct investment from Europe amounted to US\$1.3 trillion, and direct investment from to US amounted to a further US\$744 billion. The rest of the world had an investment position of US\$2.1 trillion. In other words, intra-regional investment in the APT stood at 27.4 of total foreign direct investment, while the European share was 22.7 percent, and the US share was 13 percent. ASEAN's combined share of the total amounted to 11.1 percent, while Japan's was 8.7

⁴² It should be noted that even though it is the best currently available harmonized source for bilateral investment data, the CDIS database is not complete. Especially in the case of less developed countries in the region, the full extent of investment data was not available for all partners. Where data was missing, values derived from the creditor side data were used. Nevertheless, as most of the omissions concerned smaller countries with relatively meagre investment activity, missing data does not affect the regional values significantly. This is evident in the relatively meagre differences between the inward and outward position of the APT *vis-à-vis* itself, which should be equal when using perfectly harmonized and accurate data.

⁴³ In the case of China, I have included Hong Kong and Macao in the calculation for the investment positions *vis-à-vis* third countries and the APT region, but excluded positions between China and Hong Kong, and China and Macao, for those can not be conceptualized as intra-APT investments for the purposes of this study.

⁴⁴ In the cases of Japan, and South Korea, this is also a result of these countries having very low levels of inward direct investment in general.

percent. The region also had a net negative investment position vis-à-vis the rest of the world, with a deficit of around US\$600 billion.

Table 23. Direct investment position vis-à-vis the APT in US\$ billions.

	2009		2013		2017		2020	
	Inward	Outward	Inward	Outward	Inward	Outward	Inward	Outward
ASEAN	273	196	523	371	725	468	929	636
China	243	46	431	78	532	153	600	228
Japan	17	166	24	295	38	395	68	498
Korea	38	61	63	109	78	150	97	206
United States	283	363	425	506	636	702	810	744
Europe	283	534	412	693	744	995	962	1300
RoW	1032	149	1852	324	2170	554	2836	2112
APT	572	468	1042	853	1374	1165	1695	1568

Source: Calculations based on the IMF Coordinated Direct Investment Survey.

While comparable data on bilateral investment positions are not available prior to 2009 in the IMF database, the next table nevertheless sketches the changes of the relative weight of investment positions in the last decade. As expected, both inward and outward investment has grown rapidly since 2009 on a current US\$ basis. However, the APT's intra-regional investment activity still grew at a slower pace than its investment relations with extra-regional actors.

It is especially noteworthy that from the outward perspective, the share of the rest of the world have increased from under 10 percent in 2009 to 36.9 percent in 2020. At the same time, the share of the intra-region investment activity within the APT has stayed around the same, at 27 percent. Moreover, the Europe's and the US' share from the outward perspective has fallen significantly over the last decade, especially between 2017 and 2020. Japan's and South Korea's share decreased slightly as well. At the same time, China's and the ASEAN's share stagnated over the period surveyed here.

Table 24. Share of direct investment vis-à-vis the APT in US\$ billions.

	2009		2013		2017		2020	
	Inward	Outward	Inward	Outward	Inward	Outward	Inward	Outward
ASEAN	12,5	12,6	14,0	15,6	14,7	13,7	14,7	11,1
China	11,2	2,9	11,5	3,3	10,8	4,5	9,5	4,0
Japan	0,8	10,7	0,7	12,4	0,8	11,6	1,1	8,7
Korea	1,8	3,9	1,7	4,6	1,6	4,4	1,5	3,6
US	13,0	23,4	11,4	21,3	12,9	20,6	12,9	13,0
Europe	13,0	34,5	11,0	29,2	15,1	29,1	15,3	22,7
RoW	47,3	9,6	49,6	13,6	44,1	16,2	45,0	36,9
APT	26,2	30,2	27,9	35,9	27,9	34,1	26,9	27,4

Source: Calculations based on the IMF Coordinated Direct Investment Survey.

The most noteworthy finding is that China's share in intra-regional outward direct investment is still meagre, and China remains first and foremost a destination of foreign direct investment, not a source of direct investment *vis-à-vis* other APT economies. This is evident from the fact that in 2020, only 5 percent of China's outward foreign direct investment was concentrated in the APT region, while 15 percent of China's inward foreign investment was from APT economies. In contrast, 27 percent of Japanese, 12 percent of US and 6 percent of European outward foreign direct investment is located in the APT region.⁴⁵ Thus, even on a relative scale, Europe or the US is more invested in East Asia than China.

Second, the Europe's and the US' share in APT investment is eroding at a fast pace, while the rest of the world—defined here as economies other than the APT, the US, and Europe—is growing rapidly. Third, the share of intra-regional direct investment is stagnating. This means that from an investment perspective, while East Asia is definitely becoming less reliant on Europe, and the US, it is not in a process of decoupling from the world economy, but rather undergoing a diversification of its interdependencies.

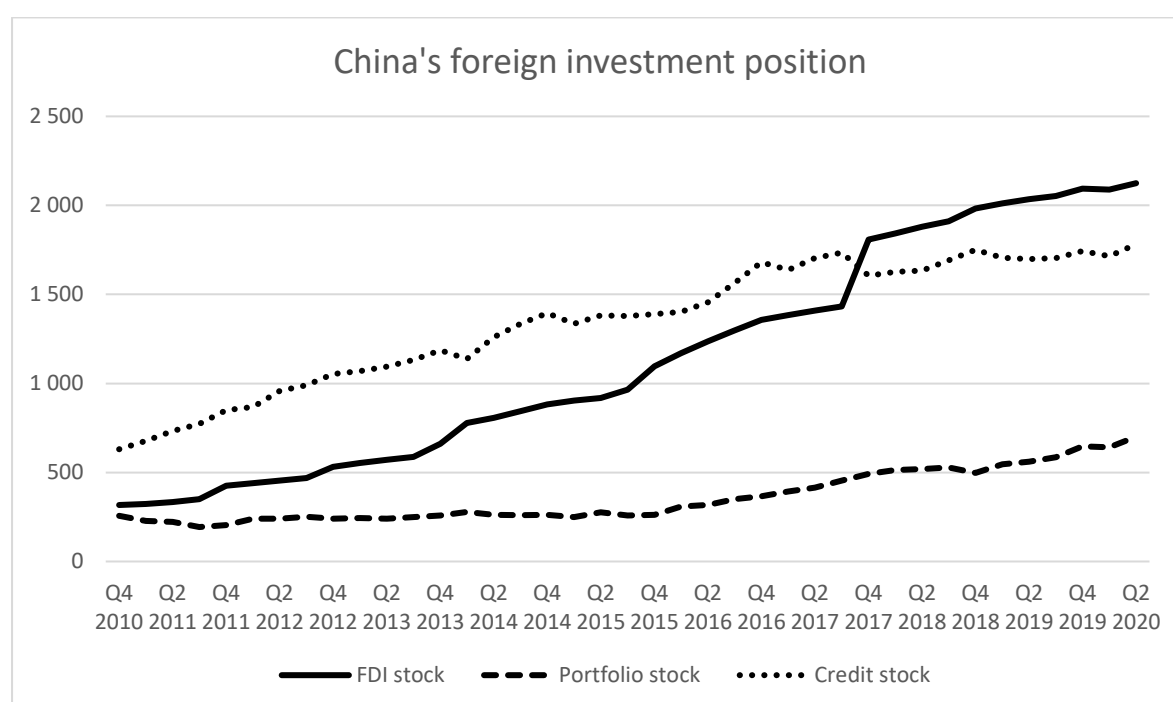
4.3.3 China's rising investment activity

While this dissertation focuses predominantly on trade and production sharing, as the previous sections have shown, FDI is an important determinant of both of these, and is also an increasingly contentious issue of international politics. From this perspective, it is necessary to at least briefly review the position of regional and extra-regional actors in international financial networks.

Chinese outflows of FDI and credit have been rising rapidly in recent years partly through the BRI, which has received increased attention from students of international relations and international finance. As the following figure shows, Chinese outward FDI stock has grown from US\$317 billion at the end of 2010, to over US\$2 trillion by 2019. Similarly, outward credit stock rose from US\$630 billion to US\$1.7 trillion, and outward portfolio investment stock from US\$250 billion to US\$700 billion.

⁴⁵ When it comes to reliance on intra-regional investment, CLMV countries show the highest shares, generally over 70 percent of their investment is with the APT, both in the inward and outward direction.

Figure 14. China's outward investment position by type of account in US\$ billions.



Source: People's Bank of China.

Nevertheless, the credit data shows a marked slowdown after 2017, when the Chinese state administration has moved to curtail financial outflows due to their fears that capital flight might lead to instability in the Chinese financial markets. Similarly, while outward FDI stock underwent a very rapid expansion in 2017, the changes in domestic regulation and approval regimes have tempered the pace of this expansion since then.

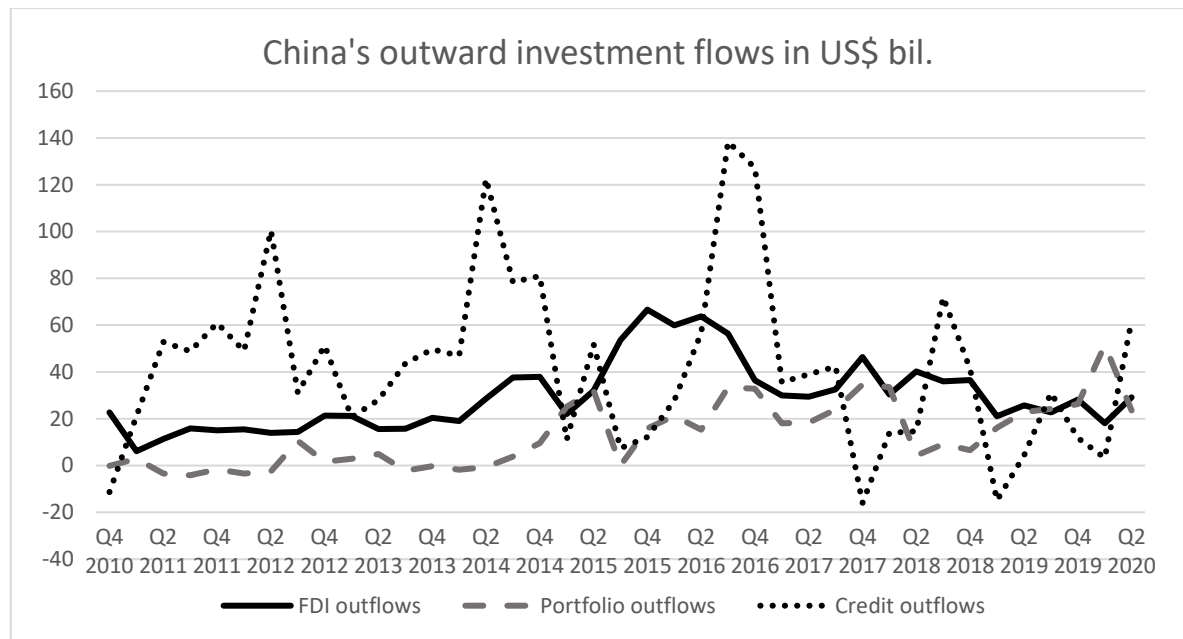
Looking at the flows instead of the stocks at the chart below, the large volatility is apparent, as well as the downward trend after 2017. Both FDI and credit has slowed down, and in fact credit outflows were negative for a number of quarters after 2017. On the other hand, portfolio investment has continued to expand at an increased rate since 2015, albeit its share is the lowest among the three categories.

Although Chinese credit stock has been stagnating, Chinese official lending nevertheless received increased political and scholarly attention in recent years due to a rapid increase in state-to-state lending after 2008, which accelerated further after the launch in 2013 of what has now become the BRI.⁴⁶ The BRI has led to a wave of

⁴⁶ The initiative was originally called New Silk Road. This was later changed to One Belt, One Road to include maritime connections in Southeast Asia, South Asia and the Middle East. The final iteration of the English name was the BRI, although the official Chinese name for the project is still literally One Belt, One Road.

accusations regarding ‘debt-trap diplomacy,’ namely that China aims to exert political influence and strategic control over credit recipients. Although such charges lack empirical justification to date (Jones & Hameiri, 2020), the transparency of Chinese lending data has been far from full. The chart below shows the estimates of Chinese official lending by different sources and specifications, which range from US\$300 billion to US\$500 billion, depending on the data source, time frame, and countries and projects surveyed.

Figure 15. China’s outward investment flows.



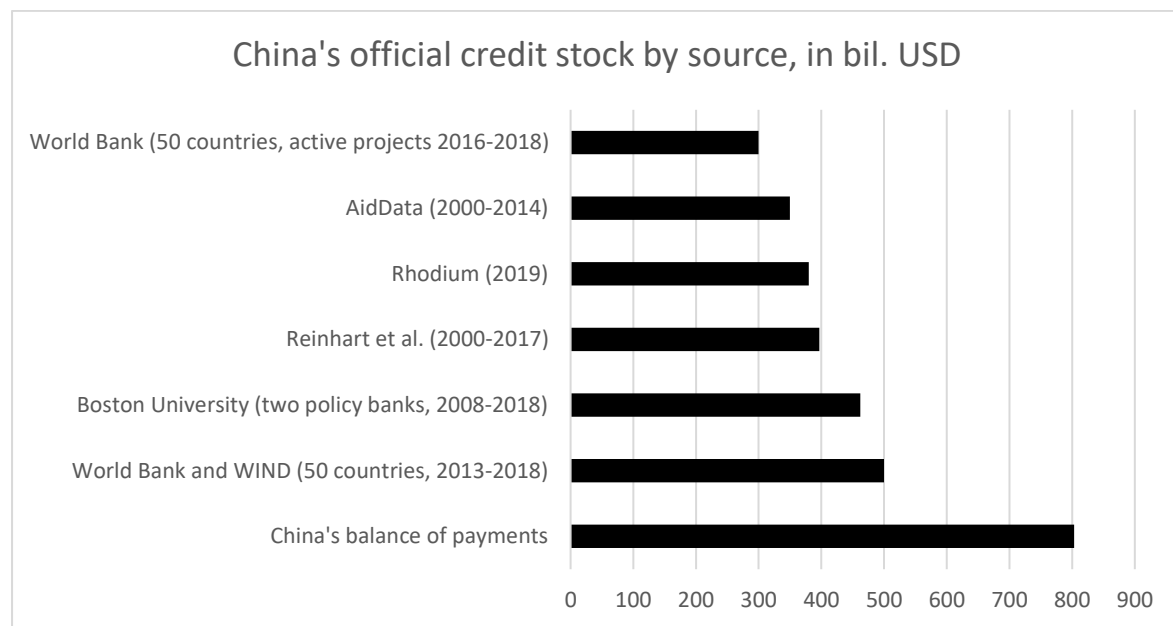
Source: IMF Balance of Payments database.

The total value of transnational financing under the umbrella of the BRI is even higher. Business data provider Refinitiv tracked over 3,000 projects with Chinese involvement worldwide worth US\$4.2 trillion in 2020. Half of these projects are counted by Refinitiv as BRI-projects, with a total financing worth US\$2.3 trillion (Refinitiv, 2020). Nevertheless, such estimates are based on a rather broad definition of BRI projects, and Chinese involvement does not necessary mean that all of the financing is provided by China.⁴⁷ This is evident from the fact that the sum of US\$4.2 trillion represents over 90 percent of China’s total outward investment stock. Moreover, some of these projects

⁴⁷ Refinitiv (2020, p. 41.) characterizes BRI projects as projects "that have been identified as such by the Chinese government or Chinese state departments; where project contractors have signed agreements with the government departments of the relevant country along BRI corridors and have obtained the relevant regulators’ approvals required for Belt and Road initiatives; or which are published on the BRI official website: yidaiyilu.gov.cn/; or projects that have direct Chinese participation at a consultant, owner, contractor and financier level, or are of strategic interest located along a BRI economic corridor."

only exist as proposals: signing memoranda and agreements for future projects have so far proven to be easier for Chinese developers than finishing those projects.

Figure 16. China's official credit stock by source.



Sources: Horn, Reinhart, & Trebesch (2019), Bandiera & Tsiropoulos (2019), Gallagher & Ray (2020), Kratz, Mingey, & D'Alelio (2020), Malik, et al. (2021)

Regardless of the data sources, it is nevertheless clear from the literature that China has become the single most important official lender, as the outflows of its policy banks have rivalled that of the World Bank and a number of regional international development banks combined (Gallagher & Ray, 2020). China's regional footprint is more limited, however. The BRI is a global project, and a large share of the financing is provided to developing countries in Africa, the Middle East, Latin-America, and even Eastern Europe. On the one hand, this represents an important aspect of growing Chinese power and influence around the globe. On the other hand, as this dissertation is concerned first and foremost with Chinese influence within East Asia.

However, it helps to put the Chinese and the East Asian figures in perspective that the total foreign holdings of East Asian economies in 2020 amounted to US\$44 trillion, which is roughly the size of the foreign assets of the US at US\$40 trillion. The United Kingdom, while a much smaller economy in real terms than either Japan or China, had US\$24 trillion in assets, while the Eurozone had combined assets of US\$50 trillion. In 2020, the APT and Taiwan accounted for around 30 percent of global GDP but held only 18 percent of global foreign financial assets.

As observers of cyclical patterns in the world economy note, financial power tends to outlive real economic power. A century after its hegemonic status in the world economy have all but ended, the United Kingdom remains one of the most important financiers. Similarly, while its real economic weight has been eroding for decades, the United States remains the centre of global finance. The historical record and the data presented above thus suggests that while China's expanding financial clout is an important aspect of its economic and political rise to great power status, it will take decades to assume the sort of financial dominance enjoyed by the UK and the US.

Even in the case of its global footprint, China's foreign lending activity has mostly focused on international development loans from policy banks, but it has failed to penetrate global financial markets to a significant degree. While China has been trying to internationalize the yuan renminbi (RMB) for wider global use for years, these efforts have so far yielded meagre results. According to data from the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which handles most foreign financial transactions, the RMB's share as an international payment currency was 2.46 per cent in June 2021, less than the share of the Japanese yen. When excluding settlements within the eurozone, the share declined to 1.7 per cent, which made the RMB only the sixth most widely used international payment currencies (SWIFT, 2021). This is hardly surprising in light of the fact that capital controls and official restriction on exchange rate movements are still in place in China.

On the systemic level, the global diffusion of Chinese finance is even weaker. Recent research focusing on the global footprints of Chinese and US financial markets and international capital flows have found that China's monetary policy have a very limited direct global transmission. On the other hand, the same paper has found that Chinese monetary and financial policies do indeed affect international markets, but not through the financial sector, but rather indirectly, through the effects of the changes of Chinese demand and supply in commodity prices and global value chains (Miranda-Agrippino, Nenova, & Rey, 2020). The latter channel of these two will be investigated in detail in the following sections.

4.4 Production interdependence in East Asia

As detailed in section 2.5, while disaggregated trade data helps to shed light on the trade in parts and components which provides the backbone for regional production networks and GVC activities within and beyond East Asia, due to the nature of trade

accounting, gross values hide important information regarding the value-added in trade and thus might obscure the relative technological importance of certain nodes and hubs within these networks. In the following sections, I use IO data to provide production- and GVC-based estimates of regional and extra-regional interdependence.

In the following section, I focus on the three sectors where GVC participation is generally the deepest, namely machinery, the auto industry, and the electronics and electrical equipment industry. Moreover, I present data from the services industries for two reasons. First, in all major economies, services make up the majority of value-added and final demand. Hence, focusing only on manufacturing would mean analysing only a smaller share of the economic activity in most countries. Second, the servicification of manufacturing means that services value-added is increasingly embedded in manufacturing trade. Moreover, the patterns of transnational value-added in services are very different from manufacturing, thus it is necessary to take into account services value-added patterns in order to get a fuller picture of the interdependent economic relationships.

4.4.1 Value-added and interdependence

The most basic use of IO tables is to be able to decompose the value-added components trade, production, and demand.⁴⁸ Moreover, the decomposition of IO data makes it possible to discern backward and forward linkages in production, and thus lets us see the position of countries within value chains, as well as the bilateral and systemic relationships embodied in backwards and forwards transmitted value-added. To illustrate this, I use value-added data from the OECD Trade in Value Added (TiVa) database (OECD, 2021), which provides a very detailed breakdown of foreign value-added involved in various sectors of the economy, and value-added origins in trade flows.

I will start here with foreign value added in the final demand in an economy as a measure of foreign dependence,⁴⁹ as it receives scant attention in contemporary accounts of international interdependence, even though it provided very useful information regarding the depth of economic reliance on other economies. One major source of international interdependence is that almost no country on Earth today can satisfy its domestic demand based entirely on domestic production, and even if it would try to do

⁴⁸ There are considerable differences between the values of domestic value-added in trade and domestic value-added in production, with the former being much larger for most countries surveyed. This is expected given that even in export-oriented economies, much of the value added is consumed domestically.

⁴⁹ In the definition of the OECD, final domestic demand is the sum of final consumption, investment, and stock building expenditures by the private and general government sectors in real terms.

so, it would most probably reduce efficiency and lower welfare, as the case of North Korea attests to. Yet the importance of foreign value-added as a share of final demand varies heavily among economies, meaning that there are considerable differences in foreign reliance both on the macro and sectoral level.

A case in point is the US–China relationship, which is often referred to as one of the most important trading relationships in the world if measured by gross trade. As noted in section 2.5, value-added data does support the notion that US–China trade is substantial and is made up of value produced in China, and the US, respectively. On the other hand, comparing the size of the foreign value added to the size of the Chinese and the US economy, the situation is very different.

First, both of these economies are rather insular on the macro level, thus their dependence on foreign inputs is limited. For China, foreign value-added in final demand amounted to 14.13 percent in 2018, while for the US the share was 12.2 percent. As for partner country shares, Chinese value-added amounted to 2.2 percent of US final demand, while US value-added satisfied only 1.75 percent of Chinese final demand. Chinese value-added was 5.81 percent in the ASEAN, 4.93 percent in South Korea, and 3.23 percent in Japan. The US share was 3.37 percent for the ASEAN, 3.93 percent for Korea, and 2.66 percent for Japan. In other words, macro level dependence is limited in value-added terms.

There are some notable exceptions, however. While the US value-added share in final demand is uniformly low among East Asian economies—and for most other economies of the world for that matter—some regional states are much more heavily reliant on China. Cambodia, Brunei, and Vietnam rely on Chinese value-added for over 10 percent of their final demand, with Cambodia recording the highest share at 16.3 percent.

There are also considerable differences between sectoral partner shares. In the chemical and pharmaceutical manufacturing sector, China accounts for 17.63 percent of ASEAN final demand, with a share of over 30 percent in the cases of Cambodia, Laos, and Brunei. In Korea, the share is 14 percent, while 8 percent in Japan, and 6 percent in the United States. The Chinese shares are very similar in many upstream manufacturing segments, such as rubber and plastics production, and metals and minerals. As expected, Chinese value-added is also very significant internationally in the electronics sector, where China contributes 14.4 percent of the value-added in final demand even in the US.

In East Asia, Chinese value-added is also remarkable in the machinery sector, although the extra-regional reach is more limited here than in electronics.

The results of the calculations for value-added by partner for some select industries are presented in the table below. There are a number of takeaways from these data points. First, the US and the Japanese economies are to a large degree insular in terms of imported value-added in final demand, even compared to China. Second, services value-added is clearly dominated by high-income economies. Third, as noted above, sectoral data paints a nuanced picture of regional and extra-regional dependencies. Most of the dependencies are limited to a small number of country-sectors in manufacturing, especially in the electronics industry, which shows the highest level of fragmentation based on IO data.

While the dependence of ASEAN economies on China is certainly on the rise, measured as value-added in final demand, Japan, and the US remain more important. Although the US value-added share in electronics demand is decreasing, it is still considerable, and the US share holds steady for professional services, a sector in which trade, and especially trade in intermediary inputs, is rising fast. Similarly, Japanese services value-added is very substantial for the ASEAN. Although China's share of services value-added shows a steady increase over time, it is far less pronounced than in the manufacturing sectors.

Looking at final demand also paints a different picture for the electronics sector than trade data. East Asia in general, and China in particular, are very influential in electronics trade segments. Value-added data shows that while China's share is certainly rising in the final demand of all of its trade partners, the level of dependence is not dramatic. On the other hand, it is also clear that the symmetry of the dependence is clearly moving in China's favor: apart from South Korea, each of China's partner countries are much more reliant on Chinese value-added in electronics than the other way around.

It is noteworthy that China's role is more muted in the auto industry and the machinery sector. The ASEAN is still mostly reliant on Japanese machinery inputs and the role of the European Union is also substantial in this sector, mostly through imported inputs from the German machinery sector. Similarly striking is that while the Chinese and Korean reliance on Japan have been decreasing very rapidly since 2000, Japanese machinery inputs are still substantial for Korean and Chinese firms, and the relative decline in value-added shares is much slower. This is due to the strength of Japanese

manufacturers in producing precision machinery for optical and electronics manufacturing.

Table 25. Value-added shares in final demand by sector and partner.

Economy	Partner	Electronics			Machinery			Motor vehicles			Professional services			Administrative services		
		2000	2010	2018	2000	2010	2018	2000	2010	2018	2000	2010	2018	2000	2010	2018
ASEAN	ASEAN	22	44	41	18	23	22	53	67	64	38	35	33	45	43	44
	China	4	11	15	3	13	19	2	4	6	1	3	6	2	4	8
	Korea	6	8	13	3	3	6	2	2	2	2	4	4	2	3	3
	USA	23	14	10	15	8	6	4	1	1	21	19	19	16	10	8
	Japan	25	10	7	35	28	23	28	18	15	6	5	5	6	11	10
	EU-27	7	5	5	16	15	16	7	5	8	16	15	15	13	11	11
China	Local	64	59	58	73	77	80	94	86	89	58	63	74	75	75	84
	Korea	4	10	15	1	1	2	0	1	1	2	3	2	1	2	1
	USA	7	5	5	4	2	2	1	1	1	12	9	7	7	4	3
	ASEAN	3	6	4	1	1	1	0	0	0	2	1	1	1	1	1
	Japan	10	7	4	9	8	6	3	5	3	3	3	1	3	4	2
	EU-27	5	3	3	8	8	7	1	6	5	11	10	7	6	6	4
Japan	Local	84	79	51	94	81	81	92	92	85	85	87	80	88	85	77
	China	2	6	16	1	6	5	1	2	3	0	1	2	1	1	3
	USA	5	4	9	2	3	3	2	1	1	7	5	7	5	4	5
	Korea	2	3	6	0	1	2	0	0	1	0	1	1	1	1	1
	ASEAN	2	3	5	1	1	2	1	1	2	1	1	1	1	1	3
	EU-27	1	1	4	2	5	5	3	2	6	3	3	4	2	3	5
Korea	Local	54	58	60	60	54	59	52	75	73	72	72	77	70	60	65
	China	3	9	12	1	5	6	2	6	5	1	2	3	2	4	6
	USA	15	10	8	9	7	5	9	2	2	11	10	8	8	7	5
	Japan	13	7	5	18	16	13	20	8	5	3	2	1	3	5	3
	ASEAN	4	5	4	1	1	2	9	2	2	1	1	1	1	5	4
	EU-27	3	3	4	7	12	12	10	7	12	6	6	5	6	7	7
USA	Local	67	63	62	70	66	61	64	51	54	92	91	91	92	89	88
	China	3	12	14	1	5	7	1	4	3	0	0	1	0	1	2
	Korea	3	5	5	1	1	2	1	3	3	0	0	0	0	0	0
	ASEAN	4	4	4	1	1	1	0	1	1	0	0	0	0	0	0
	Japan	9	4	3	10	7	7	11	14	9	0	0	0	1	1	1
	EU-27	3	3	4	9	10	13	6	10	10	3	3	3	3	3	3

Source: OECD TiVa database.

Another strength of the Japanese economy which clearly shows up in the data is the auto industry, where Japan is by far the most important source of value-added for the ASEAN. It should also be noted the ASEAN's auto demand is more closely linked to the EU than China or South Korea. Furthermore, the US reliance in machinery and the auto industry shows that emerging East Asian economies so far have failed to break into the

US market. In auto production, most of the imported inputs are from the EU, and Japan, while China, and South Korea play a very limited role.

While presenting the data for each ASEAN country would not fit into the pages of this dissertation, some further data points from the calculations deserve to be highlighted. First, on a purely intuitive level, the patterns of value-added in final demand do not appear to match with the foreign policy postures of regional economies. In the auto industry, Vietnam is almost as reliant on China as on Japan, even though the Vietnamese government enjoys much better political relations with Japan. On the other hand, Laos, and Cambodia, which are usually regarded as the countries closest to China within the ASEAN, have higher levels of dependence on Japanese and EU value-added than Chinese value-added. Malaysia, which is less supportive of regional balancing vis-à-vis China, has a higher level of dependence on Japanese and EU value-added in the auto industry than Chinese value-added, and is the only country in the region where reliance on the US in the electronics final demand is actually higher than reliance on Chinese value-added. The links between foreign policy and the changing patterns of interdependence will be investigated with more methodological rigor in the final chapter of the dissertation.

Another approach to use value-added data to better understand economic interdependence in the contemporary world economy is to look at the balance of value-added embodied in foreign final demand. This indicator shows the difference between the value-added country *a* imports—either directly or indirectly—from country *b*, and the value-added country *b* imports from country *a*. In other words, this indicator shows the ‘real’ trade balance among nations, in the sense that the balance is calculated based on the location where the value-added originates from, and the location where it is eventually consumed. Looking at the value-added balances vis-à-vis the APT thus reveals which are the most important final markets of regional production, and which intra- and extra-regional countries run deficits and surpluses with the rest of the region.

The data confirms that the US remains the primary market for East Asian value-added by a large margin. Apart from the US, Canada, and Mexico also run substantial deficits with East Asia, which shows that the NAFTA/USMCA value chains are highly reliant on imported inputs from the region.

Table 26. Value-added in final demand vis-à-vis the APT, balance, in US\$ billions.

	1996	2000	2004	2008	2012	2015	2018
Korea	-4,6	-3,4	5,4	-12,0	18,7	42,9	60,3
Singapore	6,8	1,9	10,1	9,7	25,1	33,3	43,6
Taiwan	-0,2	-7,4	0,7	0,7	12,2	33,8	41,2
EU27	11,1	-38,4	-42,3	-113,5	-11,9	18,1	28,8
Japan	28,4	17,3	37,6	31,0	-5,3	-4,0	23,9
Thailand	-10,9	-1,4	-2,5	-11,5	-16,6	1,4	11,0
Malaysia	-1,7	5,9	6,8	19,5	12,8	6,0	8,5
Brunei	1,4	1,9	0,9	4,8	4,4	1,3	0,3
Myanmar	-0,3	0,4	1,0	2,0	-0,4	-5,8	-0,8
Laos	0,0	0,1	0,0	0,3	-1,8	-2,0	-1,4
Cambodia	-0,2	-0,8	-1,4	-2,4	-3,4	-4,0	-5,1
Viet Nam	1,1	-2,5	-5,7	-16,0	-6,2	-11,8	-6,0
Indonesia	2,9	7,6	6,2	-4,6	-5,4	-13,3	-16,3
Philippines	-6,9	-3,3	-3,5	-2,6	-4,5	-12,0	-29,2
Hong Kong	-13,9	-6,4	-2,4	-6,6	-24,4	-35,4	-51,5
China	-2,0	-9,8	-53,1	-12,3	-5,2	-30,4	-78,6
USA	-40,2	-147,6	-208,6	-268,2	-288,4	-316,4	-330,4

Source: OECD TiVa database.

The value-added consumed by mainland China and Hong Kong is rising steadily, although it only amounted to around one-third of the US value in 2018, the last year for which OECD TiVa data is available. In other words, while China is becoming an increasingly important market for the rest of the region, East Asia's reliance on US demand remains much higher than its reliance on Chinese demand. The US' market power is thus still considerably larger than that of China.

At the other end of the spectrum, South Korea, Singapore, and Taiwan have the largest surplus vis-à-vis East Asia. In the case of South Korea, and Taiwan, the surplus is naturally a result of their electronics exports, which account for 81 percent, and 78 percent of the total surplus, respectively. For Singapore, the most important component of the surplus is the services industry which exports US\$36 billion more than it imports from the rest of the region.

Japan was the largest net beneficiary of trade on a value-added basis vis-à-vis the APT until 2011. This position was lost after the 2010 Great Japan Earthquake and the resulting accident at the Fukushima-1 nuclear power plant, which raised Japan's energy exports substantially due to the shutdown of nuclear power plants over safety concerns. However, Japan's surplus did recover by 2018, albeit at a much more limited scale than before.

An important aspect of the value-added data is that most developing ASEAN member states run a deficit with the rest of East Asia. This is not necessarily a reflection of the constraints imposed by the East Asian regional institutional architecture however, as numerous EU member states with below EU-average development levels run a deficit with the rest of the EU.

While the EU used to run a deficit with East Asia, this has changed in recent years. Part of the reason is the exit of the United Kingdom from the EU: the United Kingdom ran a large deficit—between 17 and 30 billion in the last decade—with East Asia. On the other hand, the eurozone, which used to run deficits with East Asia up until 2012, has also shifted to a sizeable surplus since then, mostly through the large increase in Germany's and Ireland's balance. Interestingly, the 13, mostly eastern EU members which joined the institution after 2004 are running a deficit with the APT region.

4.4.2 Value-added transmission in GVCs

The previously introduced decomposition of (Borin & Mancini, 2019) makes it possible to discern third-country value-added in exports and imports, and thus analyze the value-added trade exposures of countries *vis-à-vis* their trade partners. This decomposition is important for the reason outlined in the introduction, namely that in a world economy where production is fragmented transnationally and trade is dominated by intermediate inputs, bilateral trade values do not necessarily represent direct exposure.

One recent example concerns the collateral damage stemming from the tariffs introduced by the US government throughout 2018. These tariffs mostly targeted China, yet as World Bank (2020) pointed out, resulted in indirect exposures to a number of suppliers of Chinese manufacturers, as well as foreign firms producing in China. Based on data computed from the ADB MRIO database, in 2019 South Korean and Japanese value-added accounted for 1.14 and 1.24 per cent of the gross Chinese imports to the US, and a further 1.1 percent represented US value-added re-imported from China.

On the other hand, based on the ADB MRIO data, such third-party value-added shares are relatively meagre in the US–China relationship. As noted in section 2.5, contrary to many sources using anecdotal evidence to argue that China's domestic value-added in its exports to the US is low, it is indeed fairly high, and even in electronics

4.4.3 GVC position

A second measure to discern a country's place and role in international production is to compute the difference between forward and backward GVC participation rate, which is called the GVC position.

As previously noted, backward participation essentially means when a country imports to export, while forward participation means that a country exports inputs to its trade partners which are turned into (re-)exports for third countries. Backward and forward participation can be computed as discussed in section 2.5.2. From these two shares, we can then compute GVC position as described by (Koopman, Powers, Wang, & Wei, 2010), which takes the following form:

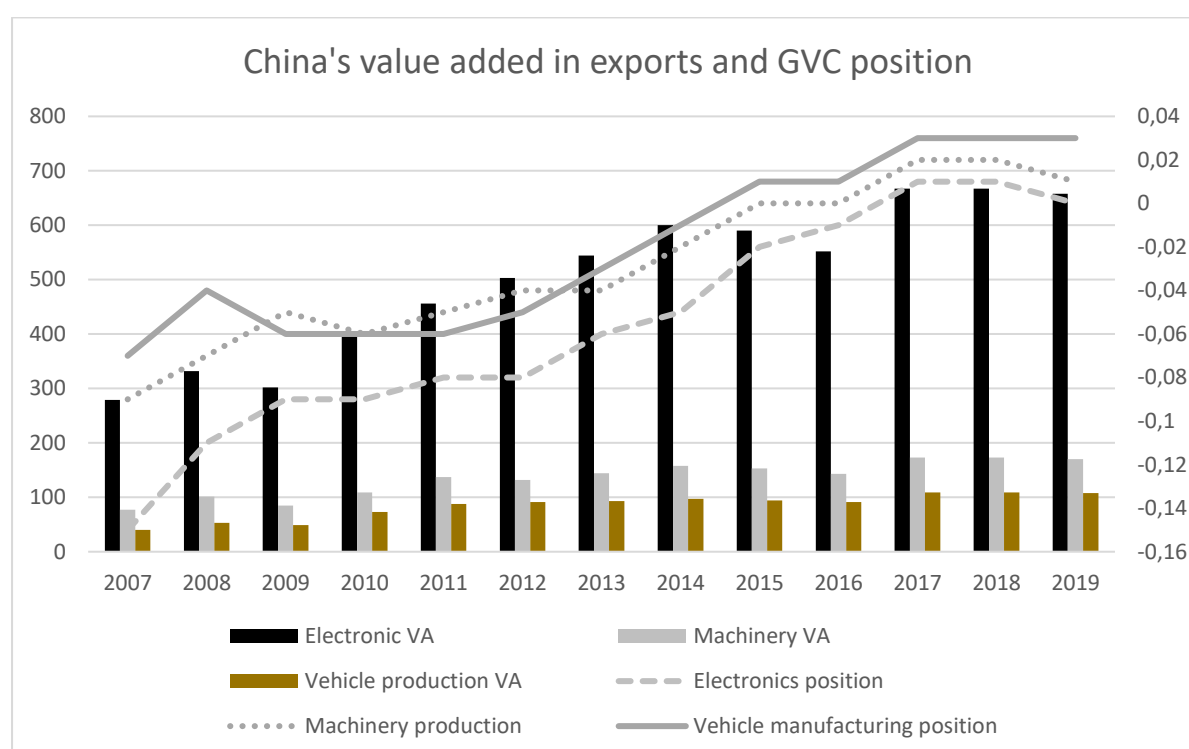
$$P = \ln\left(1 + \frac{FP}{100}\right) - \ln\left(1 + \frac{BP}{100}\right)$$

where FP is forward participation and BP is backward participation. As noted earlier, there are two ways to go about calculating GVC participation and GVC positions: these measures can be computed either based on trade or based on production. Trade-based measures calculate the participation on value-added embedded in international trade, while the production-based approach measures value-added embedded in domestic production.

This usage of value-added decompositions can highlight changes in the make-up of industrial production and the export embeddedness in international production networks. Computing the GVC participation and GVC position measures on an output basis yields the data in the following figure, which shows that China's position in the three most important production network sectors, electronics, machinery, and vehicle production, have been rapidly increasing from backwards participation to a more forward oriented position.

This means that China's reliance on foreign inputs is decreasing, while foreign producers' reliance on Chinese inputs is increasing. In other words, China is moving away from its previous role as an assembly site and export-processing hub and is increasingly acting as parts and components supplier for other export processing locations in the region and beyond. Thus, we can see that behind the growth of Chinese exports, there is indeed an increased participation from the local economy. Nevertheless, the data also shows that China's manufacturing value-added is heavily concentrated in electronics, while the importance of traded Chinese inputs in other sectors remains lower.

Figure 17. China's value added in exports and GVC position.



Source: Calculations based on the ADB MRIO and Wang, Wei, & Zhu (2013)..

Taking a more systemic look at the electronics industry captures additional important bits of information. First, there are very few countries with a positive GVC position, meaning that most states are integrated backwards into the global electronics sector, and as such are reliant on foreign inputs. There are three notable exceptions among major economies: Japan, South Korea, and the United States, which have a pronounced forward position based on both trade and output data.⁵⁰ Based on their GVC positions, these economies require relatively modest amounts of foreign inputs for their electronics production but provide high value-added parts and components for other economies.

While GVC position is not necessarily a reflection of technological superiority *per se*, the data for these three countries suggests that they possess qualitative leverage in these networks. The United States also has a forward position in most industrial sectors, such as in the manufacturing of transport equipment and machinery, where even Japan and South Korea are in decisively negative territory. China is thus one of the two major

⁵⁰ There are other examples, such as Romania, and Bangladesh. However, these developing countries most likely have a forward GDP position due to importing a very small amount of intermediate inputs while providing some parts and components for export. Among the major electronics producers, Taiwan has a GVC position close to zero, which reflects that the Taiwanese industry is heavily specialized and thus imported inputs make up a considerable share of production.

economies with a positive value for the auto industry, which, as the chart above shows, is a testament to the rapid rise of Chinese suppliers in GVCs.

Table 27. GVC positions in the electronics manufacturing sector.

Exporter	2000	2007	2011	2015	2019	2020
Australia	0,146	-0,015	0,083	0,056	-0,243	-0,255
Cambodia	-0,360	-0,221	-0,591	-0,729	-0,313	-0,189
India	0,134	-0,123	-0,106	0,088	-0,095	-0,149
Indonesia	-0,028	-0,050	-0,181	-0,219	-0,104	-0,127
Japan	0,519	0,395	0,360	0,207	0,330	0,391
Laos	-0,054	-0,948	-0,096	0,298	-0,093	0,058
Malaysia	-0,379	-0,332	-0,260	-0,336	-0,197	-0,197
China	-0,214	-0,356	-0,147	-0,008	-0,149	-0,119
Philippines	0,408	-0,087	-0,033	-0,101	-0,229	-0,212
Singapore	-0,407	-0,377	-0,383	-0,387	-0,508	-0,426
South Korea	-0,073	0,081	-0,149	-0,115	0,271	0,285
Taiwan	-0,332	-0,033	-0,091	-0,021	-0,029	0,008
Thailand	0,095	-0,083	-0,196	-0,018	-0,223	-0,244
USA	0,521	0,536	0,589	0,565	0,639	0,650
Viet Nam	-0,226	-0,296	-0,208	-0,241	-0,573	-0,606

Source: Calculations based on the ADB MRIO and Belotti, Borin, & Mancin (2020).

Nevertheless, as noted in the previous section, data on the auto industry also shows that Chinese vehicle production appears to be rather insular: most Chinese factories produce for the local market, and those Chinese auto manufacturers which have successfully entered foreign markets, mostly in developing countries, have not begun to outsource their production yet. It is reasonable to assume that their present market shares and the wage differentials between China and their export markets do not support outsourcing. Similarly, while China is an important hub for machinery production, on a value-added basis, Chinese machinery exports are relatively meagre compared to the size of the Chinese gross exports. Moreover, outside of the ASEAN, the other economies surveyed above are only reliant on Chinese value-added in machinery to a very limited extent. The picture is broadly similar when it comes to output-based GVC positions.

4.4.4 Estimating sensitivities in production network linkages

Another measure which is relevant for the determination of international political aspects of production network interdependence is the relative importance of foreign inputs and foreign demand for certain countries and sectors.

This is made possible by the Leontief decomposition, which estimates the amount and type of intermediate inputs needed in the production of one unit of output across

countries and industries based on IO data (Wang, Wei, & Zhu, 2013, p. 5.). This decomposition thus also makes it possible to discern what sort of effects would a change in output in one country-sector produce in another country-sector.⁵¹ The Ghosh inverse matrix shows the same effects but on the supply side: it is a gauge of how reliant a specific country-sector is on the supply of other country-sectors. In essence, the Leontief inverse matrix gives us a numeral value for the forward-transmitted shocks in international production networks, while the Ghosh inverse matrix is the forward transmitted shocks (Koppány, 2020).

While these decompositions are not frequently used in economics research, given that economists prefer to deal with more sophisticated decompositions of value chains, they are nevertheless very valuable for estimating sectoral and national sensitivities as defined by Keohane & Nye (1977), in as much as they show us how changes in demand and supply travel through production networks and makes it possible to calculate how exposed certain sectors are to others. Thus, such data is essential in order to understand the inherent chokepoint effects in GVCs.

These measures are computed here based on the methodology developed by Braun (2020, pp. 69–73). The basic layout of the IO table is the same as Figure XX in section 2.5.2. The matrix detailing the input-output relationships between country-industries is represented here as Z . The first step is to estimate the technical coefficients matrix A and the direct-output coefficient matrix, which are obtained as follows:

$$A = Z < X >^{-1}$$

$$B = < X >^{-1} Z$$

Where $< X >$ is a diagonal matrix, the main diagonal of which takes the values of the output of country-industries. The $a_{ih,jl}^L$ value of technical coefficient matrix shows the share of the products and services provided by country i industry h to country j industry l relative to the total input consumption of the latter; while the value $a_{ih,jl}^G$ represents the share of the output provided for country j industry h by country i industry h relative to the total output of the latter. Based on these coefficient matrices, the Leontief and the Ghosh inverse matrices can be constructed as follows:

$$L = (I - L)^{-1}$$

⁵¹ While the measures introduced in the previous section are relevant for the determination of input dependence in a static setting, the Leontief and Ghosh decompositions provide a framework to investigate the potential effects of supply and demand shocks in a more dynamic fashion by giving us the effects of input and output changes on local output.

$$G = (I - G)^{-1}$$

Where I is the identity matrix. As noted above, these two matrices show the relative importance of inputs and outputs provided by country-industries to other country-industries, taking into account the indirect connections as well. Finally, to measure the level of dependence among different country-industries, using the insights of network analysis, the following measures can be computed:

$$D^I = < L >^{-1} (L - I)$$

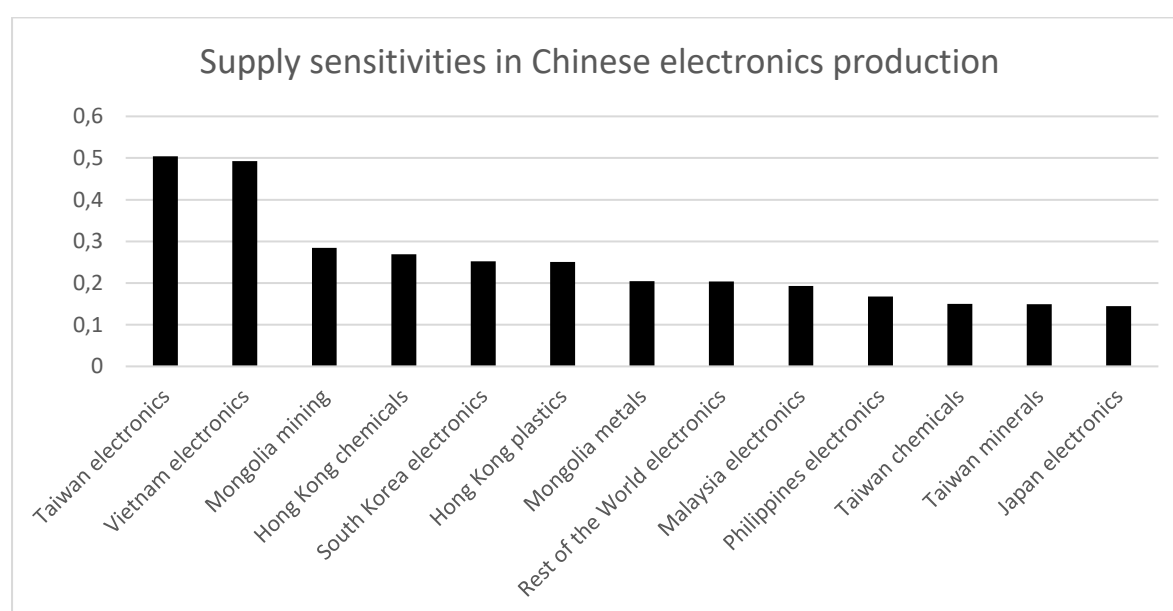
$$D^O = (G - I) < L >^{-1}$$

Where $< L >$ is a diagonal matrix where the values of the main diagonal are the same as the values of the main diagonal of the Leontief inverse matrix. The $d_{ih,jl}^I$ value to the D^I matrix represents the dependence of country j industry l on the inputs from country i industry h ; whereas the $d_{ih,jl}^O$ value of the D^O matrix shows the dependence of country i industry h on purchases from country j industry l . The input and output relationships, as well as the dependence measures can also be computed for country-industries *vis-à-vis* all the industries in a given country. This means that we can measure for example the dependence of the Chinese electronics sector on the US economy.

The following example gives an overview about the value of such data. Computing the Leontief inverse matrix for the Chinese electronics sector from the Asian Development Bank's Multiregional Input-Output Database (ADB MRIO) for the year 2018 shows the value of such an endeavor. On the supply side, the Chinese electronics manufacturing sector is quite heavily reliant on supply from regional electronics makers, as well as metal and chemical suppliers. Yet according to the Ghosh inverse matrix, the sectors most reliant on Chinese supply of electronics are in fact Chinese domestic industries.⁵²

⁵² The version of the ADB MRIO database used here contains data for 63 countries, and covers North America, Europe and East and South Asia. Rest of the World in these figures refer to the countries not covered by the database. The numeral values refer to the unit effect on output of a single unit of change in supply or demand for a given sector.

Figure 18. Supply sensitivities in Chinese electronics production.

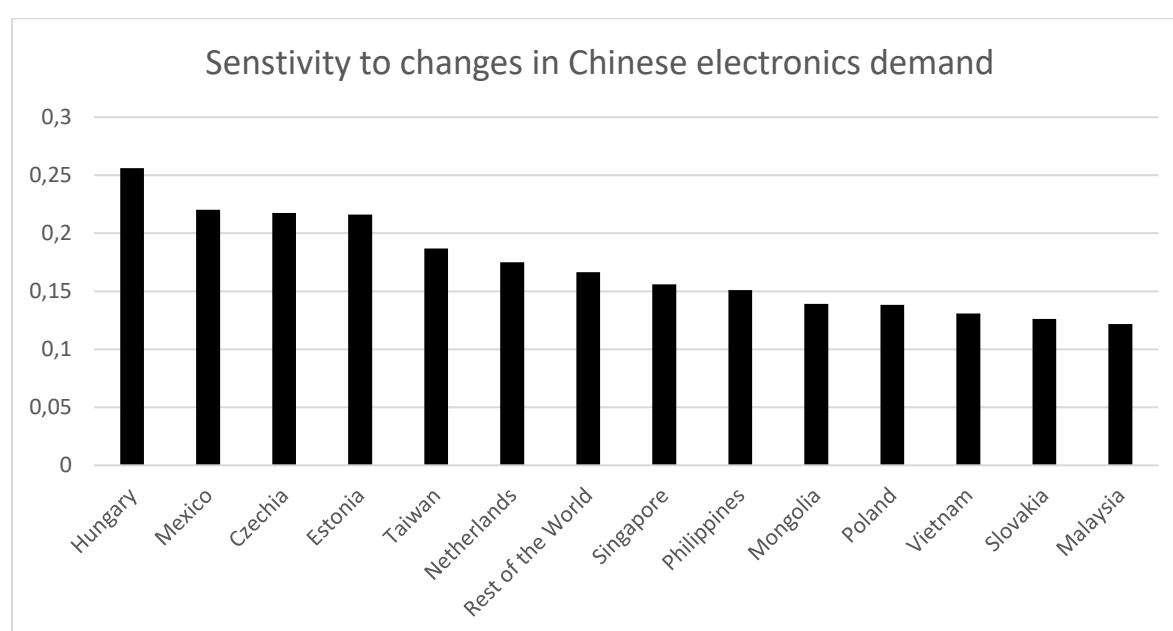


Source: Calculations based on the ADB MRIO.

Looking at the measure from the other way around, we can also see that the foreign sensitivities of Chinese electronics production are largely concentrated in East Asia and are substantially weaker compared to outside reliance on Chinese electronics inputs.

The Leontief inverse matrices also show the countries most reliant of backward transmitted Chinese shocks in electronics production. Interestingly, the most sensitive economies to Chinese shocks are located predominantly outside of East Asia.

Figure 19. Sensitivity to changes in Chinese electronics demand.



Source: Calculations based on the ADB MRIO.

This means that when it comes to the rapid forward shift in China's GVC position in electronics outlined earlier, it is mostly due to the increasing extra-regional reliance, and the sensitivities are much more meagre in East Asia and in advanced economies.

4.4.5 GVC sensitivities in East Asia

In this section, I take a more systemic evaluation of the dependencies based on the methodology outlined above. I have computed the dependencies from the ADB MRIO for 2000 and the years between 2007 and 2020.⁵³ I have normalized the values by columns for the input dependencies and by rows for the output dependencies so as to be able to compare the relative strength of the dependencies on a percentage basis. As the whole data output would be impossible to visualize, I focus here on the most important dependencies of the most regional economies, and the changes thereof.

According to the ADB MRIO data, there were very few sectors in which China had a significant foreign dependency in 2019. As expected from trade patterns, a large number of China's foreign dependencies are concentrated in the supply of primary products, such as lumber and minerals. Most of the supply dependencies are vis-à-vis extra-regional countries from the perspective of this study, such as central Asian economies, Mongolia, Brazil, and countries not covered in detail in the database, presumably African and Latin-American exporters of primary products.

However, China is also heavily reliant on overseas inputs in many manufacturing sectors, especially in electronics and manufacturing activities excluding the auto industry, electronics and machinery. Moreover, while the Chinese construction sector is predominantly reliant on other domestic sectors, it nevertheless exhibits strong dependence on some foreign inputs. The dependencies of the construction and manufacturing industry (excluding autos, electronics, and machinery) are similar to those described above: most of the strongest supply links are with industries producing primary materials and minerals in Southeast Asia and Central Asia.

In the case of the electronics industry, the strongest supply dependency, unsurprisingly, is vis-à-vis the Taiwanese electronics sector, which will be discussed in detail in the case study on semiconductors. In addition, strong supply dependencies are present vis-à-vis South Korea, Malaysia, Vietnam, the Philippines, and countries not

⁵³ I used the ADB MRIO for these calculations based on its superior data availability compared to other MRIO or ICIO tables. ADB MRIO covers each year between 2007 and 2020, whereas the coverage of other ICIOs generally ends in 2015 at the time of the submission. One exemption is the OECD Trade in Value-added database, the 2021 release of which covers years between 1995 and 2018. However, as it was released on 17 November 2021, it could have not served as the main data source of this dissertation.

covered in the database. Interestingly, the Chinese reliance on Japanese inputs is comparatively weak, albeit it is reasonable to assume that many of the inputs supplied from Malaysia, Vietnam and the Philippines are actually manufactured by Japanese MNEs or their subsidiaries.

In the United States, most industrial dependencies are concentrated among the NAFTA/USMCA countries, and the reliance on East Asian inputs is comparatively low. Even in the case of primary industries, the strongest foreign dependencies are *vis-à-vis* European economies. On the other hand, very few foreign industries apart from Mexico and Canada are reliant on US suppliers.

In the case of demand dependencies, China's industry-to-industry dependencies are mostly domestic, and foreign reliance on Chinese demand is weaker, which is not surprising for a country which has traditionally been running considerable current account and trade surpluses. The foreign dependence on US industries shows considerably higher values, especially in the case of the electronics industry. Nevertheless, the highest values are within the NAFTA/USMCA, and *vis-à-vis* European economies.

4.4.5.1 *Chinese sensitivities, and the changes thereof*

First, I show a subset of data related to the strongest country-sector dependencies *vis-à-vis* China at different points in time between 2000 and 2019. Based on the methodology outlined in section 4.3.4, I have computed sensitivities based on two times four approaches. Using the Di, and Do matrices computed from the Leontief, and Ghosh inverse matrices, respectively, I measure the sensitivity of foreign sectors to China's demand shocks, China's sensitivity to foreign demand shocks, foreign sensitivity to China's supply shocks, and China's sensitivity to foreign supply shocks. I compute these measures based on two sectoral approaches: the sectoral relationship between the most affected foreign, and Chinese sectors, and the aggregate sensitivity of all sectors of an economy *vis-à-vis* all sectors of the Chinese economy. The latter of these presents a picture of the overall sensitivity between two economies, while the former shows which sectors are the most sensitive to changes in foreign demand, and supply.

The first figure shows the ten strongest dyadic sensitivities in changes to input and output shocks *vis-à-vis* China in the year 2000. The numbers show the effect of a unit change in Chinese supply and demand on foreign supply and demand, as well as the effect of a unit change in foreign supply and demand on Chinese supply and demand. The values show the aggregate of all country-sectors for each country. The figures in the first column

represents the highest dyadic sensitivities of China, while the second column represents the countries which have the strongest reliance on China. The following figures show the same data for the years 2010, and 2019, respectively.

An interesting finding of these calculations is that the partners China is most reliant on have not changed substantially over the past two decades: we find the same group of countries dominating Chinese input and output sensitivities in all the years surveyed. Nevertheless, it is also clear that the concentration of Chinese sensitivities has decreased over time. First, the values representing reliance have markedly decreased for the ten strongest dyadic relationships, meaning that first, China's sensitivity to foreign inputs and demand has decreased, and second, the geographical concentration of China's sensitivities have declined, as over time China has developed stronger economic relationships with countries in Africa, Latin-America, and the Middle East.

On the other hand, it is also clear from the data that the US remains by far the most important among China's foreign economic relationships. As I outlined in the previous section, the absolute strength of this relationship relative to the size of the economy has decreased as the Chinese economy has become more reliant on domestic investment on the demand side. This does not change the fact, however, that Chinese reliance on US inputs and demand remains by far the strongest out of all the dyadic ties.

Figure 20. Sensitivities to input and output shocks vis-à-vis China in 2000.

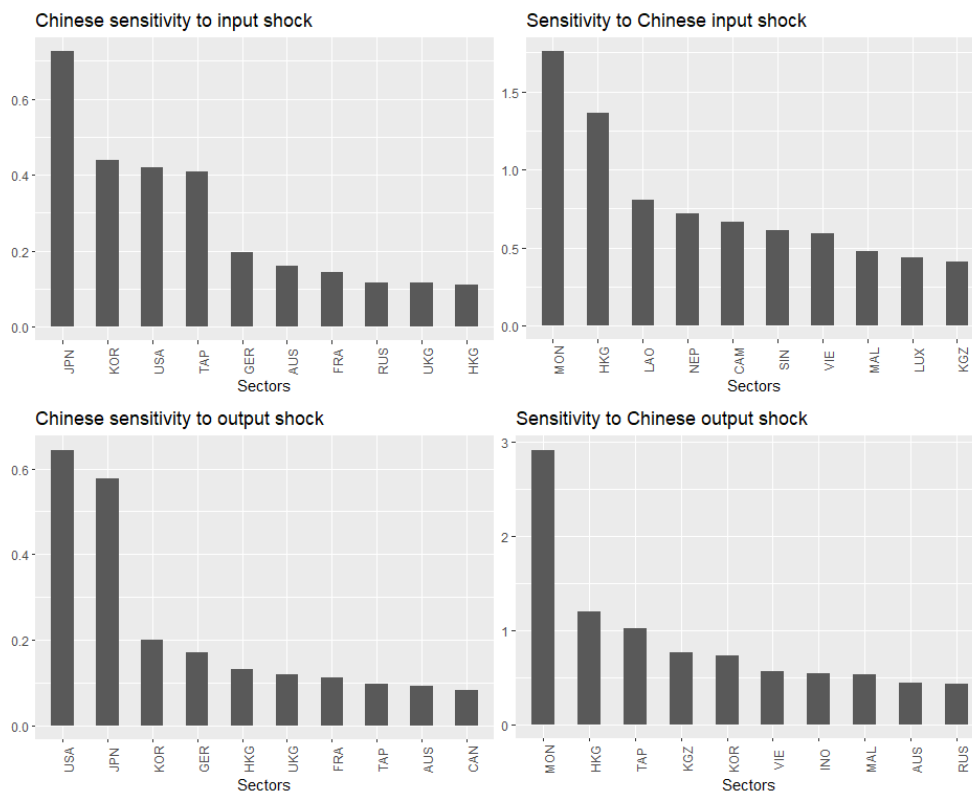


Figure 21. Sensitivities to input and output shocks vis-à-vis China in 2010.

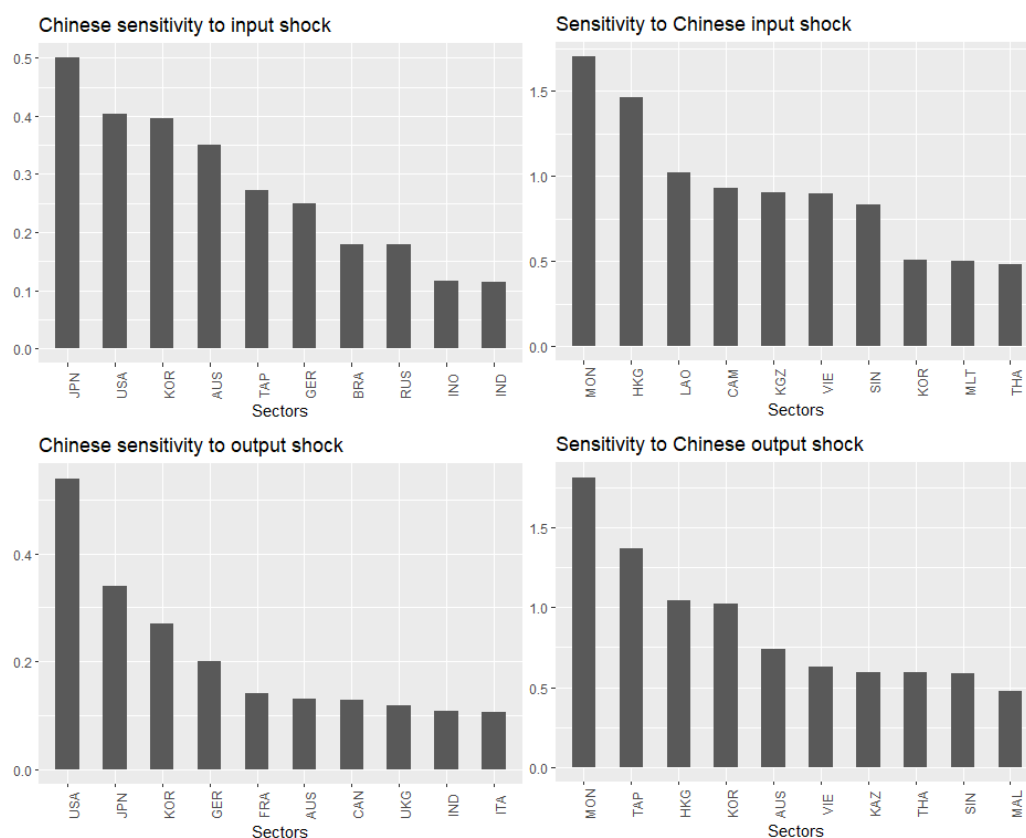
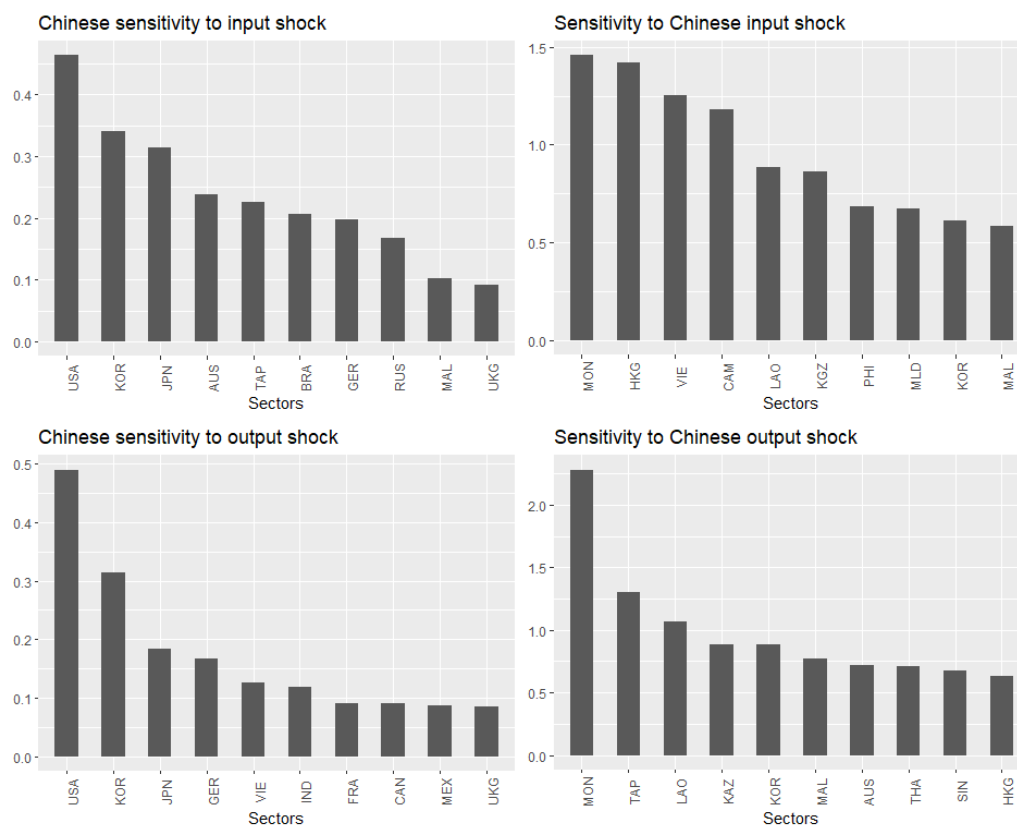


Figure 22. Sensitivities to input and output shocks vis-à-vis China in 2019.



Source: Calculations based on the ADB MRIO.

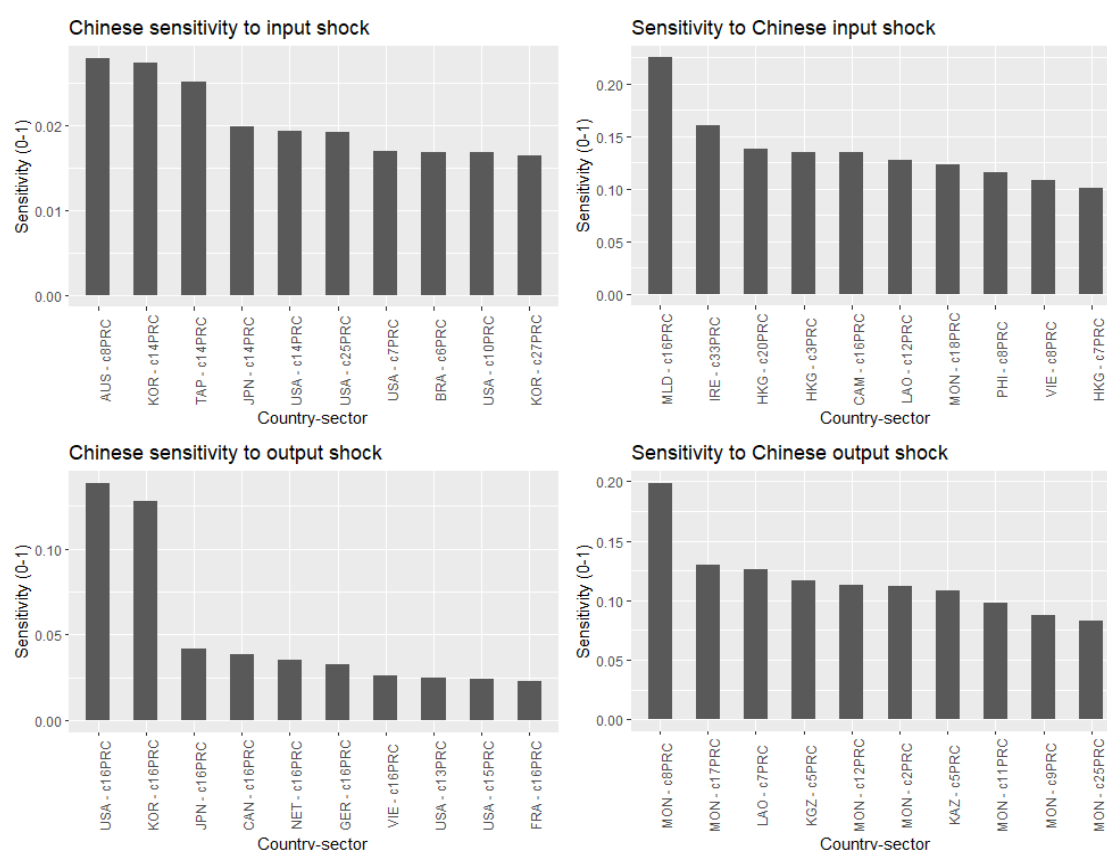
It is also noteworthy that while the importance of Japan for Chinese inputs and outputs have decreased substantially, it remains the third important partner for China in both regards. More interestingly, sensitivities vis-à-vis South Korea appear to be the second strongest, which is a result of the deep integration of the Korean and the Chinese electronics manufacturing sectors.

As for the economies most reliant on China, we similarly see continuities over the two decades. The data underscores the heavy reliance of Taiwan on the mainland Chinese economy, albeit the importance of Taiwan for mainland China is also substantial on the input side. This is unsurprising given the reliance of the Chinese electronics sector on parts and components from Taiwan. South Korea, and Australia are also among the economies most sensitive to changes in Chinese demand. For the former, this is also a testament to the deep interconnectedness of production chains between the two countries. For the latter, the dependence is concentrated in the mining and minerals sector, as Australia has been one of the main raw materials suppliers of China—although recent events, as detailed in later parts of the dissertation, might change that.

Other countries reliant on China are predominantly developing Southeast Asian and Central Asian nations, which supply the Chinese economy with raw materials, or are otherwise only scarcely integrated into the global economy and rely heavily on their largest neighbor, such as Laos, and Cambodia. This is consistent with the findings of Kleinman, Liu, & Redding (2020, p. 23), who find that on a global scale less developed and emerging economies in Southeast Asia and Africa with a generally high share of raw materials exports tend to be the most reliant on China for their growth.

The next figure shows the sectoral dissection of sensitivities vis-à-vis China. The values on the horizontal axis represent the country-sectors, the definitions of which are listed in Appendix III. In terms of Chinese demand sensitivities, most of these are concentrated in the manufacturing and machinery sectors, while the input sensitivities are concentrated in the electronics sector and raw materials.

Figure 23. Sectoral sensitivities of China in 2019.



Source: Calculations based on the ADB MRIO.

4.4.5.2 US sensitivities

I have done the same calculations as in the previous section from the perspective of the US as well. The results are summarized in the following figures.

The data shows that the US is predominantly integrated into the NAFTA/USMCA area, and its main partner sensitivities have not changed substantially apart from one very significant exception. China has become one of the most important suppliers and markets of US value-added. While this is hardly surprising, the scale of the change is much more dramatic than the other way around: Chinese sensitivities vis-à-vis the United States have been uniformly high between 2000 and 2019, while US sensitivities vis-à-vis China were virtually zero in 2000 and have become very substantial by 2019.

Surveying other country-level sensitivities, Japan clearly remains heavily reliant on the US economy, and the ties are similarly strong with South Korea, and Taiwan. Yet the data also confirms that the US is only scarcely integrated into the East Asian economic architecture.

Figure 24. Sensitivities to input and output shocks vis-à-vis the US in 2000.

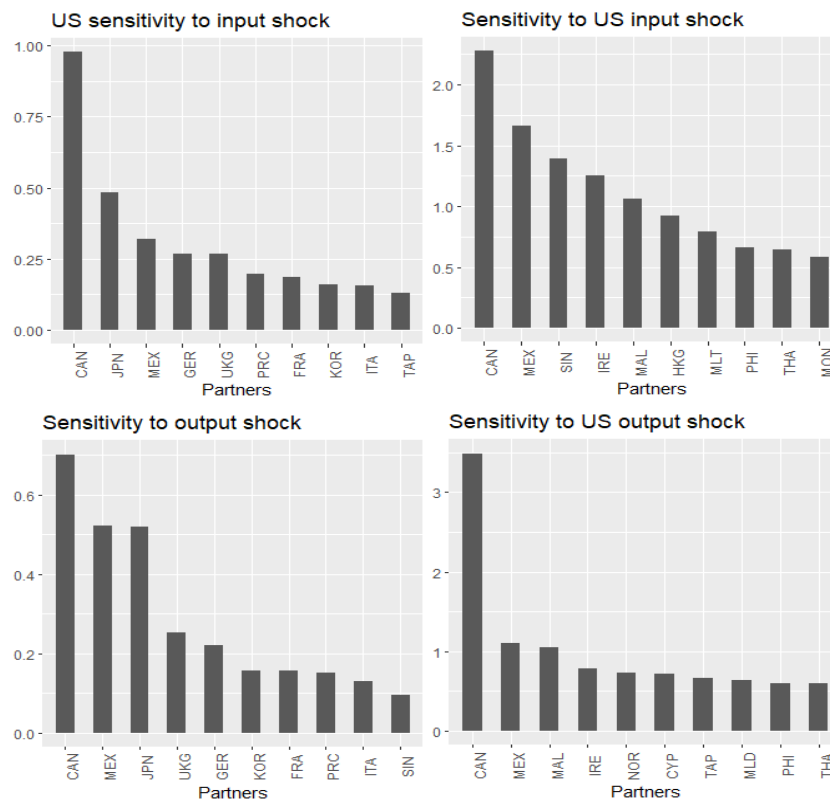
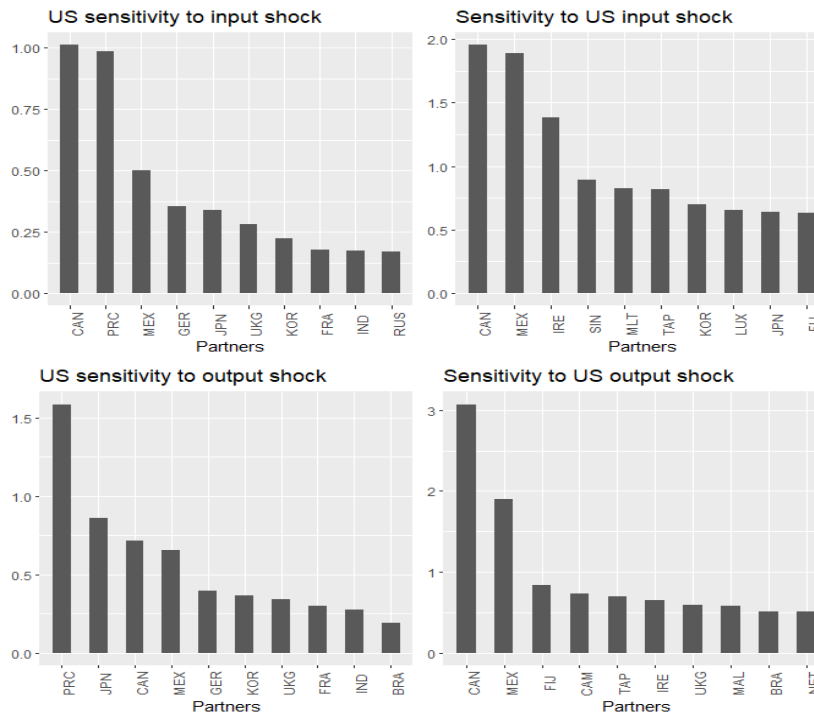


Figure 25. Sensitivities to input and output shocks vis-à-vis the US in 2019.



Source: Calculations based on the ADB MRIO.

The lack in the strength of US economic leverage in East Asia compared to that of China is an increasingly scrutinized topic within US foreign policy circles, and many

pundits argue presently that if the US is to seriously pursue a course of strategic competition against China, it would need to put more emphasis on its economic engagements within the region. These debates will be analyzed in the final chapter.

4.4.6 Summary

Across the board, supply, and demand dependencies inherent in regional and global production networks are limited for major economies. While it might sound contrarian to argue that the dependencies inherent in GVCs are not very substantial, the evidence points in the direction that the importance of transnational economic ties are more nuanced than the gross data would suggest, especially for major economies such as China, Japan, or the United States.

Naturally, the level of foreign dependence is considerably larger for smaller economies, and especially for the developing and middle-income economies in the region. These economies exhibit a much more pronounced dependence on GVC activities controlled by lead firms in high-income countries, or—increasingly—by Chinese enterprises.

Moreover, there is considerable heterogeneity among the degree of transnationalization of the different business sectors involved in GVCs. The three manufacturing industries surveyed above in more detail, namely electronics and electrical equipment manufacturing, the transport equipment industry, and machinery manufacturing have a considerably higher degree of transnational integration than other industries. Even between these three sectors, electronics manufacturing has a clearly greater level of production sharing, which is expected given the higher values, smaller sizes, and higher R&D intensities for electronics products, and parts and components. On the other hand, the transnationalization of services lags far behind that of manufacturing in general, and in the case of East Asia, the share of GVC activity in the services sector is weaker than in Europe.

It is also clear that the dependencies for major economies are heterogenous. The Chinese economy as a whole is highly dependent on raw materials and commodities from Central Asian, African, and other extra-regional countries. Another set of input dependencies for China is clustered around inputs from high-income economies in the electronics industry. While these results are unsurprising, they nevertheless empirically validate the notion that China is reliant both on commodities and frontier technologies. Moreover, as the revealed comparative advantages and the IO-based measures of

dependence suggest, China's technological competencies are mostly located in manufacturing activities which can be characterized as containing lower- to medium-value added.

On the output side, China is still mostly reliant on the US market, and—at least by 2019—the Trump tariffs did not appear to have a significant effect in this regard. China's output dependencies are clustered around machinery and electronics, meaning that these are the two sectors where changes in foreign demand can have a meaningful effect on the Chinese economy. While the Trump tariffs appeared to curtail Chinese import in these areas, the COVID-19 pandemic led to a sharp global increase in the demand for machinery and electronics, hence exports remained an important driver of Chinese growth.

The US, meanwhile, is mostly integrated with the NAFTA/USMCA countries on the production side. Nevertheless, many East Asian economies exhibit significant dependencies *vis-à-vis* the US. China and Japan are both important suppliers of the US market, and consequently, rely strongly on the US demand. The US is also a major investor in the region, more so than China, albeit less important than Europe. Moreover, the intra-regional share of US investment has been exhibiting a sharp decline in recent years, although the loss in the US share is not mirrored by a rise in China's, but rather in the rise of the share of other extra-regional investors. In summary, the US' economic role in East Asia is in strong relative decline, although it remains an important market for most regional economies.

As expected, Japan is highly reliant on both the US and China, both in terms of inputs and output. Foreign reliance on Japan has been on a sharp decline since 2000, which mirrors the relative economic decline of the country. Nevertheless, Japanese inputs are still substantial in the electronics and auto industry, and Japan is one of the few economies in East Asia which is an important partner in most sectors for most other countries and country-groups surveyed. Moreover, Japan's regional clout is very pronounced when it comes to investment positions in East Asia: its direct investment position rivals that of the US, and much higher than that of other intra-regional economies. Revealed comparative advantages also suggest that Japan remains an important source of intermediate inputs for the rest of the region. Yet based on the trends of the last decade, financial power appears to be the only category where Japan's clout is holding up in the backdrop of China's rise.

On a value-added basis, South Korea's reliance is markedly higher on the US than on China, which finding runs counter to the popular accounts suggesting that South Korea is much more integrated with China economically. Nevertheless, it is also clear South Korea–China interdependence is increasing. Taiwan is also heavily anchored to the Chinese economy, although in the electronics sector, its dependencies are more diversified. This is a result of Taiwan's central place in global semiconductor manufacturing, which is explored in the case study section. Both Taiwan, and South Korea are important investors in the region, although Taiwanese investment is heavily concentrated in mainland China, whereas the portfolios of other major investors in the region—Japan, the US, and Europe—are much more diversified and less reliant on China. In conclusion, the regional power of these countries is meagre when measured by gross indices, but they nevertheless represent important hubs in the regional production and investment architecture, which will be further explored in the next chapter.

An important difference between ASEAN as a group and the major economies of the region is that ASEAN's foreign dependencies are much higher across all sectors. This reflects the different development paths of the first and second, and the third wave of industrialization in East Asia. Japan, the NIEs, and China have developed their industries with domestic capital, whereas Southeast Asian latecomers such as Malaysia, Thailand, Indonesia, or Vietnam relied heavily on FDI and GVC-participation for their development. In these countries, most manufacturing activities, and even the services sectors are dominated by foreign inputs.⁵⁴

The ASEAN as a group is also an important investor in the APT region, albeit there are obviously substantial differences between the investment portfolios of different ASEAN member states. The investment footprint of the CLMV states is very small, whereas Singapore is a major outlier given its special position as a regional hub for the financial services industry. Nevertheless, Malaysia, and Thailand are also increasing their investment activities in the region, hence the ASEAN is becoming more self-sustained in terms of direct investment, although this change is happening at a very moderate pace.

On the one hand, this piece of information gives credence to the notion of ASEAN centrality, for it is very clear that in terms of its international value-added dependencies,

⁵⁴ It should be noted, however, that when looking at the ASEAN as a group, Singapore's extremely high dependency on foreign inputs skews the local value-added numbers downwards. Nevertheless, as the Singaporean economy accounts for only 13.6 percent to the ASEAN's GDP, the effect is moderate and does not mean that the numbers for the ASEAN are severely affected by Singapore's special economic situation.

ASEAN is the most open area of the region to international trade and investment. For any sort of regional economic framework to be meaningful, ASEAN's inclusion would be necessary. On the other hand, when conceptualized from a political economy perspective, the power relationships inherent in GVC dependencies appear to undermine the notion that ASEAN is 'in the driver's seat' of East Asian integration, for it is heavily reliant on foreign inputs and foreign markets, and as such, its material leverage is limited.

Another conclusion from the results is that in this setting, it does appear that among major economies, wholesale sanctions cannot exert heavy costs, and consequently, cannot yield substantial political gains. It follows from this that the world of major powers is that of weaponized interdependence, where the capabilities necessary for economic coercion lie in qualitative measures of interdependence, such as technological attainment and network centrality.

When it comes to relations between lesser states and great powers, however, the hierarchical nature of international production, coupled with the higher reliance on GVCs, trade, and investment for middle-income and emerging economies, as well as some high-income economies in East Asia, such as South Korea, Singapore, and Taiwan, creates a delicate balance of power.

As evidenced by the data on input sensitivities, China is highly reliant on Japanese, South Korean, and Taiwanese inputs, hence in the current state of Chinese technological progress, China would not be able to sever its ties to these economies for political reasons, for example as a method of economic coercion. On the other hand, the trajectories of dependencies suggest that while China's reliance on foreign inputs is sharply decreasing, outside reliance on China is on the rise in most sectors. The qualitative aspects of this will be explored in the next chapter in some more detail.

4.5 Measuring regional economic influence

Albeit the previous sections argued in detail that the diffusion of economic power in a world economy dominated by GVCs and IPNs is heterogenous, and strengths and weaknesses are unevenly distributed not only among countries, but among sectors as well, for this discussion to be applicable for the purposes of IR and IPE research on regional order, and the international political economy of the contestation of the economic architecture, an operationalization of aggregate measures representing the peculiarities of this sort of interdependence is unavoidable.

To this end, this section will operationalize measures based on the lessons from the descriptive data analyzed above, so as to provide a better variable for regional interdependence than the ones surveyed in the beginning of the chapter. The operationalization will take regional economic power as a combination of control over investment, and trade and market dependence both on a quantitative and qualitative scale.

4.5.1 Operationalization

As outlined in the previous sections, FDI is an essential element of GVC-formation and as such, that of GVC interdependence as well. In order to operationalize the relative financial power of states and groups of states in the APT region, I use their net investment position *vis-à-vis* the rest of the region as a proxy for their importance in regional finance, as calculated in section 4.3.2.

The second part of the operationalization of regional power will involve a traditional, gross index of trade interdependence. Even though GVC penetration means that chokepoints are more important than before in trade, the simultaneous fragmentation and agglomeration of manufacturing means that agglomeration yields a degree of control and power over manufacturing networks, as Chinese control over PPE mask production or rare earth minerals show. To this end, the regional trade hubness measure will be used as an indicator of the importance of regional economies in GVCs and IPNs. However, to reflect the importance of the control of technology, this measure will be weighted with economic complexity as a proxy for the technological sophistication of the exports of regional economies. Both of these measures were calculated in section 4.2 of the dissertation and will be used here in the same configuration.

The third component of the index reflects market power and market dependence in value-added terms. To this end, I use the value-added share in final demand as an indicator. The reliance on a foreign market is constructed as the share of value-added of country *a* in the final demand of the region; whereas market power is measured as the value-added absorbed by country *a* from the region as a share of the total value-added of the region. In order to measure the value-added dependence, I take the difference of the value exported and consumed, or in other words, I take the value-added balance in final demand, which was introduced in section 4.4.1. Both dependence and reliance will be measured on a sector of origin basis as outlined by Borin & Mancini (2019), meaning that traded value-added from third countries is counted based on the origin of the value-added. In order to provide a relative scale of measurement, I divide the balances by the

total value-added of the region, excluding the value-added of the country the influence of which I measure. Data for this measure are used from the OECD TiVa database.

I normalized all three components to a value between 0 and 1 and add up the three components to calculate the index. This means that the final index can range between -1 and 3, given that the third component can take up negative values.

The ASEAN countries are conceptualized as a group for this measure, for it would not make much sense to calculate a measure of regional influence for each of the ASEAN member states, which are in general relatively weak by themselves economically. Moreover, as in the previous calculations, the US will also be added so as to give a benchmark for extra-regional economic clout, which in the case of the US carries obvious political relevance as well.

As the financial data is not available for years before 2009, this measure will only be calculated for years after 2009. Moreover, as the OECD TiVa data is not available after 2018, the index cannot be calculated for later years. The chart in the next section provides a cross section of the data for four years between 2009 and 2018.

4.5.2 Results

The results of the calculations show that in this conceptualization the US retains its pivotal economic influence vis-à-vis the APT region due to two factors. First, the US consumes about 1.57 percent of the total value-added of the APT region. This means that at the end of the value chain, the US remains the main consumer of East Asian value-added, even though based on gross trade data, East Asia's trade reliance on the US is weakening.

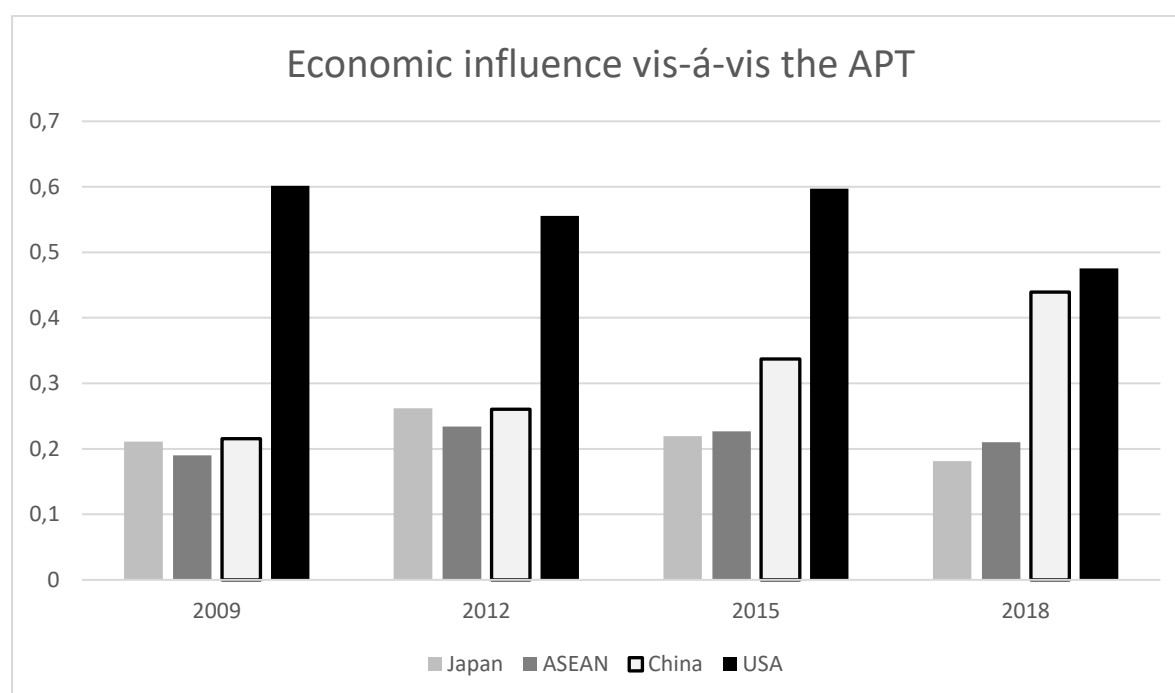
Second, China's outward direct investment in the APT region remains scarce, as most of China's investment activities are concentrated outside of its neighborhood. This means that in a world where the transnationalization of production is inherently linked to FDI, the influence of Chinese companies is limited by their lack of investment in the APT.⁵⁵ In contrast, the US remains a key source of capital in the region when it comes to

⁵⁵ It should be noted that the FDI data is not completely reliable for the complexity of, and lack of transparency in, international accounting. For example, it is well known that Chinese companies utilize shell companies or networks of shell companies set up in tax havens in their overseas financial dealings. Similarly, MNEs headquartered in the US, Singapore, or Japan are also adept at using tax havens and jurisdictions with lax financial regulations. This means that the investment values are potentially higher than what is accounted for by the IMF. Nevertheless, the IMF calculates the investment values on a mirrored basis as well, which reduces the potential for serious flaws.

Another note regarding the investment values is that I did not consider portfolio investment and overseas lending. Gathering bilateral, harmonized data on such transactions is even more problematic than in the case of FDI. Much of Chinese financial activity has been through portfolio investment and

FDI. Similarly, Japan's relatively high position in this index compared to its shrinking relative trade values is largely due to its importance as an investor in East Asia.

Figure 26. Economic influence vis-a-vis the APT.



Source: Own calculations.

On the other hand, the results also show that the role of the US is in steep decline, whereas China's exhibits a steady rise at an increasing pace. China's share in the absorption of the value-added exported by the rest of the APT has almost caught up with the US at 1.52 percent in 2018. Moreover, its role in gross trade and its hubness vis-à-vis other APT countries is naturally much higher, although the lower economic complexity of China's trade subdues its role in this index to an extent. As the values for 2018 suggest, the economic influence of China and the US is comparable, whereas the ASEAN's and Japan's are obviously much smaller.

Although detailed data is not available for the most recent years, there are two processes which might augment this chart by the year 2020. One is the coronavirus pandemic, which led to an import surge in the US and an export surge in China and the rest of East Asia. It is safe to assume that the US' share in consuming APT value-added has increased. Second, as noted in section 4.3, the US share of APT investment declined substantially in 2020. Although China's investment share did not rise either, the US'

international bank loans, hence the Chinese financial clout might be undercounted here as well. However, Japanese, and US banks are also heavily involved in international financing in East Asia, hence in all likelihood the potential difference including such flows would make is limited.

decline would counteract the increased influence derived from the rise in APT's reliance on the US market during the pandemic.

5 Market power, and chokepoint effects: the trade war, and semiconductor fabrication

While the macro measures outlined in the previous chapter have yielded important information for the study of trade relations in East Asia and beyond, GVC analysis has severe limitations. The first of these limitations has to do with sectoral data and the identification of chokepoints. Due to the amount of data required, international IO tables are constructed on sectoral aggregate levels, meaning that the final details of subsectoral movements cannot be traced. This poses a challenge for the investigation of potential chokepoint effects, which manifest in narrower fields of the economy.

Second, while macro conceptualizations of economic power can yield information about the potential for the use of economic coercion, as noted in the introduction, such capabilities come with severe limitations in the contemporary context. Exercising market power might not be entirely successful even in a setting where the structure of international interdependence is hierarchic if the policies aimed at leveraging market power are poorly crafted, the networked nature of GVCs is not taken into account, implementation is uneven, and the initiators misperceive the resolve of their adversary.

In the following section, I look at two interlinked cases which illustrate these points. The first such case is that of the US–China ‘trade war’, which is a powerful, albeit unsuccessful utilization of US market power aimed at altering Chinese behavior by exerting heavy costs on the Chinese economy. The second one is the ‘semiconductor war,’ or in other words the increasingly severe restrictions imposed by the US government on the provision of semiconductors and semiconductor technology to Chinese entities, which is closely linked to the ‘trade war.’ This case study investigates how the semiconductor industry reflects the peculiarities, and also the limits, of the weaponized interdependence framework.

Both of these cases will be of limited depth, for the aim of this chapter is not to produce a detailed case study in the service of hypothesis testing, but to illustrate certain conceptual point regarding the nature of coercion and great power rivalry under the conditions of contemporary interdependence and to discuss the strengths and weaknesses of the weaponized interdependence approach to IPE in a GVC environment.

5.1 The US–China ‘trade war,’ and its effects

5.1.1 Trade policies as US foreign policy tools

The ‘trade war’ between the US and China is a culmination of numerous US grievances towards China’s economic rise. At various stages of the dispute, the US government argued that China manipulates the exchange rate of its currency vis-à-vis the US dollar so as to strengthen its export competitiveness; that China is employing market-distorting industrial subsidies which provide an unfair advantage to Chinese firms and lead to overcapacity, dumping, and consequently the loss of US market share and employment in certain heavy industrial sectors such as steel manufacturing; that the large number of Chinese state-owned enterprises (SOE), which receive favourable political treatment, represent another form of market distortion; that China has so far failed to liberalize vast segments of its domestic market, especially the financial, and the services sector, to foreign competition; and that Chinese entities are heavily involved in the infringement of US and other foreign IPR.

China is routinely breaking its WTO obligations due to the aforementioned market distortions, and protectionist measures. Moreover, the US government was the main organizing force behind an impetus in the WTO for a rules-based, institutional answer to the unfair competitive conditions and protectionist policies, aims which were shared by the EU and Japan as well (Raszewski & Cohen, 2017).

However, the Trump administration ultimately decided that the WTO, and in particular the WTO’s dispute settlement mechanism no longer proved to be an adequate tool for policing Chinese behaviour and instituted unilateral action so as to force a change in China’s economic policies starting in 2018.

From the perspective of weaponized interdependence, this meant that the Trump administration was willing to bear the costs of the economic sanctioning of China for it viewed the international environment as threatening to its interests by permitting China to exploit the openness of the global economic system and that of the US economy to develop its own technological capabilities and rival the US’ preponderance (Mastanduno, 2021; Segal, 2021). From the Chinese perspective, the trade war was part of a broader US effort aimed at suppressing China’s rise, limiting the pace of its economic ascent, and curtailing its rising influence in world politics, and the global economy (Wang J. , 2021).

5.1.2 The timeline of contemporary US–China trade frictions

5.1.2.1 *The first phase: washing machines, solar panels, steel, and aluminium*

The opening salvo in the aforementioned ‘trade war’ was launched on January 22, 2018, by US President Donald J. Trump, who decided to impose “safeguard tariffs” on the imports of solar panels and washing machines based on Section 201 of the US Trade Act of 1974. Under Section 201, the US International Trade Commission has the authority to investigate if a US industry is injured by imports, and if so finds, authorized the President to take action to remedy the injuries inflicted upon US industries (Bown & Joseph, 2017).

The Trump administration announced the second wave of punitive measures on March 1, 2018, which targeted steel and aluminium imports with a 10, and 25 percent tariff, respectively. While the tariffs were originally announced to cover all import, by the time they went into effect on March 23, 2018, many US trade partners negotiated exemptions, but China, and Japan, remained on the list of sanctioned countries.⁵⁶ These actions were based on a national security investigation security under Section 232 of the Trade Expansion Act of 1962 launched in April 2017, and finalized on February 16, 2018. Section 232(b) allows an investigation into whether imports "threaten to impair" US national security and authorizes the executive to impose tariffs or quotas if a threat is established (Hufbauer, 2016, pp. 9–10). As a result of the investigation, the US Department of Commerce found that imports of steel and aluminium products threaten US national security.

In response to the solar panel and washing machine tariffs, the Chinese government launched antidumping and countervailing duty investigations into US sorghum imports in February 2018, and imposed preliminary tariffs in April, albeit ended the tariffs in May, after a wave of negotiations with the US. After the announcement of the steel, and aluminium tariffs, China imposed retaliatory tariffs on aluminium waste and scrap, pork, fruits and nuts, the import value of which roughly corresponded to the Chinese export values for steel and aluminium to the US. Moreover, in June 2018, the EU also imposed retaliatory tariffs on some iconic US goods, such as bourbon whiskey, motorboats and yachts, motorcycles, blue jeans, corn, and peanut butter (Bown, Jung, &

⁵⁶ Canada and Mexico, as well as the European Union, South Korea, Brazil, Argentina, and Australia received initial exemptions from the tariffs for a limited time period.

Lu, 2018a). This was followed by similar retaliatory tariffs by Canada in July 2018, as well as Turkey, and Mexico.

The US Trade Representative filed a dispute with the WTO challenging the retaliatory tariffs. Also in July 2018, the Trump administration announced 12 billion in subsidies for US agricultural producers who have faced export losses due to the retaliatory tariffs. In January 2020, the Trump administration widened the application of the steel and aluminium tariffs to more product groups. The US lifted the tariffs on Canada, and Mexico in May 2019 as part of the negotiations of the USMCA. The US later reimposed, then again lifted the tariffs on Canadian steel in mid-2020. In October 2021, the US agreed to lift the tariffs on part of the EU's metal export, and the EU lifted the retaliatory tariffs in exchange. Hufbauer, & Jung (2018) estimated that the steel and aluminium tariffs have cost the US\$650,000 for each job created in the steel industry due to higher prices and the costs of retaliation.

5.1.2.2 The second phase: the US–China ‘trade war’

The third ‘arrow’ of Trump’s trade war consisted of a national security investigation related to the alleged theft of US intellectual property by Chinese entities, which was initiated in August 2017 by the US Trade Representative (USTR) based on Section 301 of the US Trade Act of 1974. Under Section 301, the USTR needs to determine “that a foreign country is denying the United States its rights under a trade agreement or is carrying out practices that are unjustifiable, unreasonable, or discriminatory and burden or restrict US commerce.” If the investigation so finds, the president can take retaliatory action (Hufbauer, 2016, p. 11). The USTR report published in March 2018 argued the lack of IPR protection in China for foreign companies, discriminatory ownership restrictions and licensing requirements on foreign companies, cyberattacks by Chinese entities against US IP, forced technology transfers, etc. constitute a national security threat inasmuch as it contributes to the erosion of the US technological advantage (USTR, 2018a).

Based on this report, the Trump administration proposed a 25 percent punitive import tariff on Chinese goods mostly in the machinery and electronics sectors, initially targeting product categories the combined import value of which amounted to US\$50 billion in the previous year (USTR, 2018b). China similarly outlined a list of proposed retaliatory tariff measures targeting US product groups the imports values of which were similarly US\$50 billion in the previous years.

The first phase of the US tariff increase went into effect on July 6, 2018. This executive action raised import tariffs to 25 percent on US\$34 billion worth of import products groups based on the previous USTR list. This was followed immediately by a wave of Chinese retaliatory tariffs targeting US\$ 34 billion worth of US imports. The two countries imposed the second phase of the first round of tariffs vis-à-vis each other on August 23, 2018, when they levied 25 percent tariffs on additional US\$16 billion worth of product groups from the original, in spite of continued talks between the two governments over the summer of 2018.

The first tranche of US tariffs targeted mainly intermediate inputs, and consequently hit predominantly non-Chinese production networks. Based on trade data from 2017, the majority of companies affected by the tariffs on electronics products, transportation equipment, electrical equipment and appliances, machinery, other manufacturing products were predominantly foreign, and foreign-owned enterprises (Lovely & Yang, 2018). In contrast, the Chinese list contained in large part agricultural, and petroleum products, as well as some machinery products (Bown, 2018).

The Trump administration outlined the second tranche of the proposed “safeguard” tariffs in September 2018, which list contained product groups the import values of which amounted to US\$200 billion from China in 2017. Based on import values, half of the sanctioned products were intermediate inputs, a quarter of them were capital goods, and 24 percent were consumer goods. China also produced a list of retaliatory tariffs, which covered US\$60 billion in import value.⁵⁷ 67 percent of the affected products were intermediate goods, 26 percent of capital goods, and 7 percent of consumer goods. Nevertheless, the US retaliatory tariffs were lower than the previous tranche at 10 percent, and the Chinese retaliatory tariffs ranged between 5 to 10 percent, reflecting that the two governments were only moderately willing to substantially raise the costs of domestic production by taxing intermediate inputs (Bown, Jung, & Lu, 2018b). These tariffs went into effect on September 24, 2018.

The US–China ‘trade war’ experienced a truce from September 2018 onwards, as the two governments started negotiations on their economic relations, and China temporarily suspended the retaliatory tariffs on some US auto and auto parts imports in January 2019. However, the US raised the tariff rate on the product groups affected by

⁵⁷ The difference between the import values affected by the US rate hike versus the Chinese one is a reflection of China’s trade surplus with the US: the Chinese government could not sanction the same value of imports, for it imports considerably less from the US than *vice versa*.

second phase of tariff raises from 10 to 25 percent in May 2019 and announced that it intends to raise the tariff rate *vis-à-vis* China to 10 percent for all the product groups so far not sanctioned in August 2019. In response, China threatened tariff raises on the already sanctioned product groups and further tariff hikes on product groups yet to be sanctioned. However, the escalation did not materialize in 2019, and the two countries eventually signed an economic and trade agreement on January 15, 2020, which went into effect on February 14, 2020. The document was branded as a ‘Phase One’ agreement, which did not lead to the lifting of punitive tariffs and the return of the pre-trade war *status quo*; neither did it solve the systemic issues the US sought to overcome through economic coercion.

In the agreement, China promised to raise its imports from the US by US\$200 billion over two years, compared to a baseline of US\$186 billion worth of imports in 2017. The promises in the agreement included \$54 billion in additional energy purchases, US\$78 billion in additional manufacturing purchases, US\$32 billion in farm products, and US\$38 billion in services. The treaty stipulated the cancellation of previously threatened but not yet implemented tariff raises, and the reduction of US import tariffs to 7.5 percent on US\$120 billion worth of Chinese imports based on baseline trade values. The agreement also contained promises regarding the protection of IPR; refraining from forced technology transfers; recognition of sanitary standards for agricultural products; the provision of “fair, effective, and non-discriminatory market access” to a number of financial services sectors;⁵⁸ to refrain from exchange rate manipulation,⁵⁹ etc., as well as a fairly weak dispute settlement mechanism outlining high-level consultations in the event of a disagreement regarding implementation (USTR, 2020; Woo & Mason, 2020).

The Trump administration also made threats about imposing tariffs on the auto imports from foreign countries, which would have had a major effect on the economies of US allies Germany, Japan, and South Korea. The US Commerce Department initiated a national security investigation based on Section 232 of the Trade Expansion Act of 1962. This investigation concluded in February 2019 and recommended that the US would be justified to take action against auto imports based on national security grounds. The Trump administration had a 90-day deadline after the submission of the report to

⁵⁸ The sectors mentioned in the treaty are the following: banking services, credit rating services, electronic payment services, financial asset management services, insurance services, and securities, fund management, and futures services.

⁵⁹ President Trump repeatedly alleged that China is manipulating its exchange rate to raise the price competitiveness of its exporters.

decide whether to pursue executive action based on the findings, but ultimately decided not to do so. Although Donald J. Trump lost the presidential election in 2020, the new US administration of Joe Biden kept the tariffs in place as of the submission of this dissertation.

5.1.3 The effects of the ‘trade war’

US average applied tariffs on Chinese products rose from 3.1 percent in the beginning of 2018 to 21 percent before the conclusion of the ‘Phase One’ agreement, then fell somewhat to 19.3 percent. The share of Chinese exports subject to the US tariffs stood at 66.4 percent in 2021.

The average applied tariff rate of China vis-à-vis the US rose from 8 percent in early 2018 to 21.8 percent in 2020, and remained at 20.7 percent even in January 2021, long after the entry into force of the Phase One agreement. The share of US exports subject to the Chinese tariffs stood at 58.3 percent.

At the same time, China did lower its tariff rate for the rest of the world: after the second round of retaliatory tariff increases, China reduced its MFN tariff rates for pharmaceuticals, IT products, autos, and other consumer and industrial goods in 2018, 2019, and 2020, and instituted a broader, although shallower MFN tariff rate reduction on all imports in January 2019, and January 2020 as well. Due to these tariff reductions, China’s average applied tariff rate for non-US import fell from 8 percent to 6.7 percent in 2018, and to 6.1 percent in January 2021. Moreover, the entry into force of RCEP has further reduced Chinese applied tariffs (Bown, 2021a). As the tariff data shows, the ‘trade war’ represents an extraordinary wave of trade barriers among great powers since the end of the Cold War. However, the exercise of US market power did not yield substantial gains for the US.

The stated goals of the trade war were the reduction of the US trade deficit, the strengthening of IPR protections in China, the revaluation of China’s currency, the safeguarding of the US manufacturing and technological base, and encouraging manufacturing to reshore to the US and decouple from China through raising the costs of outsourcing. As noted above, from a more general IR framing, the aims were to curtail the pace of China’s economic ascent, and its rising influence in world politics and the global economy (Wang J. , 2021).

There is scarce evidence for reaching the policy aims on any of these fronts.

First, the failure of the managed trade of the ‘Phase One’ agreement is apparent: the end of October 2021, China has only reached 60 percent of the purchase commitments outlined in the agreement. The figure was around the same at the end of 2020, when purchases stood at 59 percent of commitments. In other words, Chinese import from the US were barely higher in 2020–2021 than in 2017, the baseline year (Bown, 2021b).

Second, overall trade data show that the US actions did not lead to the rebalancing of US trade patterns. According to US trade data, both the value of Chinese imports and the trade deficit with China declined somewhat compared to the baseline in 2017. US imports were US\$505 billion in 2017, then rose to US\$538 billion in 2018, but sharply declined to US\$450 billion in 2019, and US\$435 billion in 2020.

However, the total US trade deficit has increased since the start of the ‘trade war.’ Overall US trade deficit was on a slowly declining trajectory since the 2008–2009 crisis and stood at US\$361 billion in the baseline year. However, the deficit markedly increased since, rising to US\$438 billion in 2018, to US\$472 billion in 2019, to US\$616 billion in 2020. The deficit was on course to be the largest since the 2008–2009 crisis at over US\$700 billion in 2021 due to the expansion of domestic demand after two rounds of economic stimulus approved by the US Congress to mitigate the negative economic consequences of the Covid-19 pandemic.

Additionally, value-added data provide some nuance to the falling import numbers from China. Based on ADB MRIO data disaggregated with the methodology of Borin & Mancini (2019), the US consumption of value-added originating from China remained robust in spite of a limited decline in 2020, which can be linked to the logistical disruptions related to the COVID-19 pandemic. In fact, the data for 2020 is still higher than any year except 2019, while the value for 2019 is by far the largest. However, the 2019 data is likely amplified by companies on both sides of the pacific stockpiling products from the Chinese, and US partners before the higher tariffs came into force.

Table 28. Domestic value-added absorbed by the importer, in US\$ billion.

	2015	2016	2017	2018	2019	2020
China–US	284	273	286	299	370	345
US–China	80	75	79	157	182	169

Source: Calculations based on the ADB MRIO.

In addition to the value-added data showing a limited reduction in Chinese value-added absorbed in the US market, Amiti, Redding, & Weinstein (2020) have found that the costs of the tariffs were borne almost entirely by US firms and consumers through

higher prices. This means that the costs of the US actions were not actually levied on the Chinese economy.

Nevertheless, US value-added absorbed by China rose substantially during this period, although most of the increase is a result of indirectly absorbed value-added. In other words, a large share of the US value added which were absorbed by Chinese firms and consumers were imported into China through third countries. However, this was not a result of US reshoring or the expansion of US manufacturing due to the tariffs, which was envisioned by the US government. While US manufacturing employment did rise modestly between 2017 and 2019, this was a broader trend at the time: the gains in employment were consistent since the end of 2009, but plateaued in the Spring of 2019, when the ‘trade war’ was heating up. Moreover, the manufacturing share of total nonfarm employment in the US remained almost unchanged since 2017, hovering around 8.5 percent.⁶⁰ Manufacturing as a percentage of GDP stood at 11.4 percent in the first quarter of 2018 but decline to 11.1 percent by the third quarter of 2021.

The US measures were also unsuccessful in changing Chinese behaviour and economic policies. While the US’ aim was to foster the liberalization of the Chinese economy and create a more market-oriented environment, the Chinese Communist Party (CCP) has substantially increased the state’s regulatory reach since 2020 and moved to curtail the freedoms of private enterprises in the technology and online services sectors, among others (Blanchette, 2021). The Chinese ‘state capitalism’ has not moved towards Western ideals since the start of the ‘trade war;’ on the contrary, the US, the EU, and other developed economies have instead turned towards industrial policy and state intervention in supply chain management.

More generally, Chinese domestic and foreign policy continued to develop in a manner which is antithetical to the US aims regarding behavioural change (Yan, 2021; Wang J. , 2021). The US efforts at economic coercion were unable to limit the expanding economic influence of China: as noted in Chapter 4, the expansion of China’s trade and investment relations has continued to expand rapidly in East Asia and beyond.

There is only one sector where the period after 2017 yielded some developments in accordance with US demand: the financial sector, where the Chinese state did in fact

⁶⁰ The period between April and September 2020 seen a sharp uptick in the share of manufacturing employment, when the first wave of the Covid-19 pandemic led to a sudden drop in imports from China, and Europe. However, the share of manufacturing employment contracted quickly afterwards, showing that trade with China and the rest of the world proved to be resilient in the face of disruptions and the expansion in domestic manufacturing was a temporary reaction to the shock to the global trading system.

increase the openness towards foreign investment companies (Kinder, 2021). But in general, the Chinese ‘state capitalism’ did not move towards Western ideals since the start of the ‘trade war;’ on the contrary, the US, the EU, and other developed economies have instead turned towards industrial policy and state intervention in supply chain management.

5.1.4 Practical and theoretical reasons for the failure

The failure of the US policies can be explained in part with the contradictions between the aims of the US policies and their design.

First, in terms of economics, bilateral trade deficits may have no significant meaning (Watanabe, 2018). The fact that the US trade deficit did not decline due to the tariff increases vis-à-vis China was broadly in line with the economics research on the inconclusive relationship between trade deficits and trade agreements, which is explained by the fact that trade balances are inherently the results of differences in savings and consumption patterns among countries instead of tariffs (Russ & Swenson, 2019; Council of Economic Advisers, 2018).

Second, some aims of the agreement were not only unrealistic in terms of economics, but also contradicted other aims of the same agreement. The prime example is that the Trump government aimed to both safeguard the US technological base and curtail technology transfers to China and strengthen IPR protection in China for US companies. However, economics research found that strengthening IPR protections for foreign investors in a certain country actually raises the likelihood of technology transfers to the said country, for better IPR protections lower the costs of investment and technology transfer.

Similarly, setting numerical targets for US exports to China was contradictory to the aim for decoupling. Managed trade, as the method is known, would mean that first, the US–China trade would be beholden to political bargains, which is ineffective and creates a potential for volatility given the abundance of political frictions. Second, raising US exports to China, especially in industries producing primary products, such as agriculture and energy, raises the US reliance on Chinese demand, and as such, is a strategically detrimental course of action. Third, managed trade merely created trade diversion. US farmers and energy exporters could already sell their agricultural products on the global market, where agricultural prices were on a long-term increase since 2015

due to the expansion of global demand. The managed trade brought about by the ‘Phase One’ agreement merely meant that China switched its soybean import source from Brazil to the US, and Brazilian exporters switched their export markets to those vacated by the US exporters. Thus, the managed trade raised the US dependence on China, and lessened the efficiency of global markets by diverting trade.

Another fundamental issue stems from the nature of the global trading architecture organized around GVCs. In a setting where production is organized in multi-country networks, bilateral sanctions are not effective on most manufacturing goods, since these can be shipped around in the network to circumvent the tariffs. Trade data suggests that this partly explains why Chinese export did not suffer, and US imports did not contract. However, the GVC-based nature of interdependence meant that the observed trade diversion effects did not lead to the diversion of production.

The GVC-centric nature of contemporary interdependence provides an additional reason why the US actions did not result in a serious increase of costs for the Chinese economy. A large share of US tariffs levied on Chinese imports targeted intermediate goods in manufacturing, which was essentially a tax on producers who use the imported intermediate inputs for their operations in the US. As noted above, the vastness of GVCs meant that in many cases, substitutes were found, or Chinese inputs were able to enter the US through third countries. However, as evidenced by China’s large hubness value dissected in Chapter 4, the country is indeed dominant in the supply of many industrial intermediate inputs, hence the substitution of Chinese goods is relatively problematic on a large scale. The Chinese retaliation, meanwhile, predominantly targeted primary products, where first, the domestic share of value-added is higher, and second, the costs do not travel down the value-chain.

Hence, while the market power asymmetries favoured the US on paper, the networked nature of interdependence and the way in which the market power was executed through tariff raises on intermediate products meant that the outcomes were not conforming to the expectations based purely on a market power-based logic. Moreover, the fact that Chinese value-added consumed in the US did not decline rapidly after the institution of tariffs provides further evidence that as noted in Chapter 4, hubness in production networks in itself provides a form of leverage which is still relevant today.

A more fundamental issue stems from the theories presented in the literature review on trade, and sanctions. A combination of the trade expectation theory (Copeland, 2014) and the theory of imperfect contracts and sunk costs in export entry (Antràs & Chor,

2021) yields two important observations: first, that actors—may those be states or MNEs—base their actions on expectations about future economic opportunities and long-term costs, and second, that the nature of imperfect contracts and the sunk costs of GVC establishment mean that MNEs would not necessarily make drastic changes to their production networks even in the face of severe economic shocks. As noted earlier, this has been substantiated by empirical evidence on the effects of the 2008–2009 Global Financial Crisis, the 2011 Great Japan Earthquake, and more recent, albeit so far preliminary data on the effects of the Covid-19 pandemic.

Finally, the political costs of the policy change for the Chinese side appear to have been misperceived by the US. For the exercise of economic power to be effective, the costs of the US tariffs would have to be higher than the costs of policy change for China. The latter, however, appears to be exorbitantly high. The Chinese government have repeatedly emphasized in recent years that it aims to overcome the ‘middle-income trap’ and become a high-income economy by 2035 through fostering domestic innovation and technological independence. One often cited example of this was the ‘Made in China 2025’ program which promoted home-grown strategic industries with vast state subsidies, high investment in research infrastructure, and favourable regulatory treatment. Moreover, the state’s control over the Chinese economy has expanded rapidly in recent years (Blanchette, 2021). It follows from this that the US demands were essentially requesting China to fundamentally change its economic and political model, something which is a core interest and a red line for the CCP.⁶¹

A further, systemic outcome of the ‘trade war,’ and more generally the ‘America First’ trade and economic policies of the Trump administration characterised by bilateralism was the weakening of the global rules-based trading order (Watanabe, 2018), as well as the perceived loss of confidence in US leadership due to the attempted coercion of its own allies by the Trump administration.

The steel and aluminium tariffs affected several NATO member states, as well as Asian allies of the US, South Korea, and Japan. According to recent gravity modelling, apart from the Chinese, and the US economies, the negative effects of the trade frictions

⁶¹ Beijing defined its ‘core national interests’ as (1) safeguarding the basic system and national security, that is, the stability of the leadership of the Chinese Communist Party (CCP) and that of the socialist system; (2) national sovereignty, territorial integrity, and national unification (the unification of Taiwan and Mainland China); and (3) sustained and stable economic and social development (Wang J. , 2011). The third of these is essentially tied to international economic exchange. The first core interest is indirectly tied to it, for the main legitimacy of the Chinese Communist Party is economic development.

were the most substantial in Japan, South Korea, as well as Taiwan, Indonesia, Thailand, and Malaysia. Furthermore, Australia, and Germany were also amongst the most hard-hit collateral casualties of the US–China frictions (Allen, Arkolakis, & Takahashi, 2020, p. 424). In other words, the transnationalized nature of production in manufacturing meant that the economic measures aimed at China travelled through GVCs and IPNs and ended up hurting economies the progress of which is integral to US strategic interests.

The Trump administration also exerted pressure on these two East Asian allies to sign or amend FTAs. First, the Trump administration successfully lobbied South Korea to modify and amend the US–Korea (KORUS) Free Trade Agreement in 2018, aimed mostly at providing better access to the Korean market for the US auto sector⁶² and obtaining a voluntary export restriction from Korea in the steel industry (USTR, 2018c).⁶³ With Japan, the US reached the US–Japan Trade Agreement signed on October 7, 2019, which provided a limited market opening focusing on the elimination and reduction of tariffs on agricultural and industrial products (USTR, 2019). While these treaties cannot be described as coercive, they nevertheless broadly reflected US preferences, as Japan would have preferred the US to return to the TPP instead of signing a separate agreement, which in essence represented a more robust quasi-bilateral agreement between the two countries (Watanabe, 2018); while South Korea was forced to accept steel restriction, albeit received some concessions in return.⁶⁴ At the same time, the Trump administration and the Biden administration declined to return to the TPP framework, which would give better market access to the US in East Asia and South America, would strengthen the US’ hand in setting the trade rules of the 21st Century, and thus would provide a firmer economic and political foundation for the US’ Asia policy.

In the case of the punitive tariffs, the US measures were inconsistent with WTO commitments and violated the norms of the rules-based trading regime (Kimura, 2021, p. 31). Instead of demonstrating that China’ economic and trade policies represented a violation of its WTO commitments, the US resorted to an unprecedentedly broad definition of national security to argue that its tariff raises are legitimate and legal reactions to an economic injury. Apart from the institution of tariffs, the US further

⁶² It should be noted, however, that even though the modification of the KORUS increased South Korean quotas for the import of US autos, the previous quotas were never filled (Eichengreen, 2018).

⁶³ The KORUS was originally signed in 2007 but did not enter into force until 2012 due to domestic political hurdles during ratification.

⁶⁴ As noted above, the US also renegotiated the NAFTA, which was signed in November 2018, and entered into force in July 2020.

weakened the WTO by vetoing new appointments to the Appellate Body of the WTO's dispute settlement panel, which effectively paralyzed the work of the body from December 2019 and thus undermined the most effective system for the rules-based settlement of bilateral economic disputes (Shin & Ahn, 2019).

This is a sharp reversal of the historical norm. Although the US did experience important bouts of protectionism in the 1970s, and 1980s, it has “stayed a staunch supporter of the liberal trading order,” played a pivotal role in successive rounds of the GATT, promoted economic openness to developing and emerging economies as part of the Washington Consensus, and supported the creation of the WTO and dispute-settlement panel with binding arbitral powers (Eichengreen, 2018, p. 8). As noted above, this tactic yielded scarce returns, as the envisioned trade, investment, and employment realignment did not materialize. On the other hand, the weakening of the institutions underpinning the global trading order carries potential long-term costs for the US.

5.2 The semiconductor ‘trade war’

5.2.1 Stylized facts about the sector

I will briefly analyze the sector which is regarded as perhaps the most important vulnerability to both China and the US, the semiconductor value chain. Semiconductors, which form the basis of microchips and memories among other applications, are regarded as fundamental for 21st century manufacturing and technological development. The aim of the following section is to illustrate in practice some conceptual issues which are relevant to understanding the interplay between international politics and production network interdependence.

In the case of the semiconductor industry, these stylized facts are as follows.

- i. The semiconductor value chain is characterized by extreme specialization.
- ii. As a result, there is no example of a local/domestic value chain in semiconductor fabrication, or in other words, no single actor has achieved self-sufficiency in the sector, and until very recently, no state actor even aimed to do so.
- iii. The value chain as a whole is transregional.
- iv. In spite of its transregional character, there are very important intra-regional agglomerations within the value chain in East Asia.

- v. Domestic and firm-level factors have a large influence on international specialization within the value chain.
- vi. State power manifests predominantly through chokepoint effects.
- vii. Nevertheless, the utilization of these chokepoint effects could bring unintended long-term consequences by providing incentives for self-sufficiency in the target country, thereby reducing the relative competitiveness of the domestic value chain, as well as reducing the future utility of making use of such chokepoints. In other words, utilizing chokepoint effects appears to suffer from rapidly diminishing returns in this case.
- viii. Domestic firms will lobby to prevent political leaders from utilizing chokepoint effects, for such measures threaten to reduce efficiency gains for domestic firms involved in the value chain.
- ix. Reduction in domestic efficiency and relative competitiveness might mean that—all else being equal—the utilization of chokepoint effects ends up as a net negative gain for the aggressor.

5.2.2 A brief overview of the semiconductor frictions

5.2.2.1 *The semiconductor ‘trade wars’ of the past*

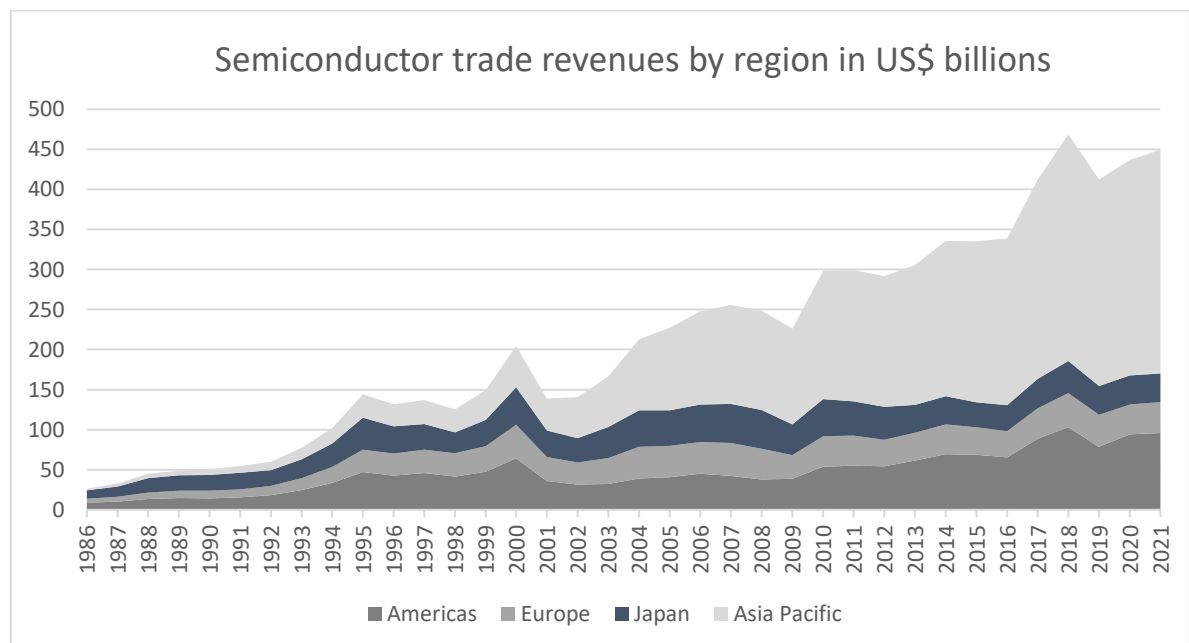
Semiconductors are materials predominantly used in the manufacturing of electronics devices which are neither conductors nor insulators of electricity, but their conductivity is between the two ends of the spectrum. Their most common use involves the fabrication of integrated circuits on semiconductor wafers. Such technology is the foundation of the ‘microchips’ found in personal computers, smartphones, servers, automobiles, routers, etc.. The most common microchips are logic chips doing calculations, dynamic random memory chips storing data temporarily in order to speed up computations, and flash memory chips storing data permanently. Photoresistant semiconductors are also used as imaging sensors in smartphones, and digital cameras, among other usages.

Given its importance, political friction related to semiconductor manufacturing are not new. In the 1980s, as computing had started to become an integral part of business activities, Japanese companies began to capture an increasing share of the global market for semiconductors. By the late 1980s, Japanese companies generated half of the global revenues in the semiconductor industry (METI, 2021, p. 60). In reaction, a group of US

chipmakers petitioned the US government to launch a Section 301 investigation against the Japanese semiconductor industry (Bown, 2020, p. 7).

This, coupled with the rapid growth of the Japanese economy and the perception of a relative decline in the US led to trade frictions between the two countries. The US government argued that the Japanese dominance in semiconductor manufacturing is a result of government subsidies and market distortions aimed at fostering domestic competitiveness in the Japanese economy. As a result, Washington used its leverage to broker a semiconductor agreement with Japan in 1986, in which the Japanese government agreed to ‘voluntary export restrictions’ (VER), or in other words the limitation of the Japanese market share through administrative measures. VER “was often called a “grey-area measure,” because it was deemed neither inconsistent with the General Agreement on Tariffs and Trade (GATT), the precursor to the WTO, nor in conformity with it”. This device was routinely used to settle Japan–US trade disputes before the establishment of the WTO but became inconsistent with WTO obligations (Watanabe, 2018, p. 28).

Figure 27. Semiconductor trade revenues by region.



Source: World Semiconductor Trade Statistics (2021).

The US intervention resulted in the long-term loss of Japanese market share from the 1990s onwards. However, there are competing explanations for this dynamic, and it is not entirely clear if the VER was the sole reason for the decline. First, the rising prices for semiconductors led to increased competition in the sector. Second, the Japanese government shifted away its resources from silicon research in the very period when an

increased number of foreign competitors were beginning to enter the market (Solís M. , 2021). Third, Japanese firms were also slow to follow the technological shifts of the time and continued to focus on memory chips instead of logic chips, which ended up capturing an increasing share of the market (Okada, 2006).

In any case, the decline in Japanese market share did not coincide with the rebirth of the US chip industry. On the contrary: as the data on semiconductor trade revenues by region from the World Semiconductor Trade Statistics (2021) show, from the mid-1990s onwards, the sector has become increasingly dominated by other Asian manufacturers, mostly Taiwanese, and South Korean firms. By the mid-2000s the former newcomers had become the leaders in the industry, and by the 2010s, the share of the Asian manufacturers excluding Japan exceeded 60 percent.

Ironically, the South Korean and Taiwanese entry into the market was made possible partly by the dynamics unleashed by the US–Japan agreement: the constraints of Japanese supply created new opportunities in the DRAM market, which South Korean and Taiwanese companies began to take advantage of. As their market share grew, South Korean and Taiwanese manufacturers also faced anti-dumping investigation by the US in the 1990s, which again led to ‘voluntary’ price increases by, and countervailing duties against, South Korean companies,⁶⁵ and to the institution anti-dumping tariffs on Taiwanese semiconductor imports between 1997 and 2002. The early 2000s also saw US investigations into collusion and price fixing against South Korean companies, which resulted in fines and in some cases prison terms for executives (Bown, 2020, pp. 11–12).

By the mid-2000s, the WTO ITA agreement, widespread trade liberalization in East Asia, and China’s entry into the WTO led to the swift outsourcing of electronics manufacturing to emerging East Asian economies, primarily to China, which became the largest market for semiconductors by 2005 (PwC, 2017). This has resulted in considerable FDI flowing into China from South Korea, Japan, Taiwan, and the US to fund semiconductor factories, as described by the fragmentation and agglomeration theory.

The process leading up to the semiconductor trade war was rooted in gradual shifts in the US policy towards China in the ICT sectors. The current semiconductor

⁶⁵ As for the countervailing duties, Japan and the EU also instituted such measures against Korean companies after these received state-funded bailouts in the late 1990s, when the Asian Financial Crisis and the sharp decline in demand resulting from the burst of the Dotcom-bubble left them on the brink of insolvency.

‘trade war’ follows years of debate about the potential pitfalls of the hollowing-out of manufacturing industries in high-income economies. As in the case of the trade war outlined in the previous sections, many of these debates were fueled by the concerns regarding the growing competitiveness of Chinese competitors and were aggravated by the perception that the Chinese state employs industrial policies inconsistent with global trade norms and creates an unfair environment for Western companies by limiting their entry to the Chinese market, while ostensibly supporting the entry of Chinese companies into Western markets.

Moreover, the US Section 301 investigations also highlighted the growing concern regarding Chinese acquisitions of Western technology through the acquisition of Western companies by Chinese firms, in many cases through shell structures intended to mask the ultimate beneficiary of the transactions.⁶⁶ These issues were aggravated by the penetration of high-end computing into increasingly broad areas of business activities through the rise in cloud computing, applications of Machine Learning and Artificial Intelligence, the automation of services and the digitalization of manufacturing, etc. A related, more traditional national security aspect of the digitalization concerned China’s civil-military fusion activities and the threat posed by Chinese acquisitions of high-end dual use technologies.

In summary, semiconductor fabrication has become beholden to all of the forms of political contestation faced by GVCs which were listed in the introduction to this dissertation. As such, it presents a useful case study to sketch the contours of the practical issues and challenges presented by the new normal in the IPE of GVCs.

5.2.2.2 *The developments under the Trump administration*

The *raison d’être* of the semiconductor trade war, however, can be traced to the frictions in another key ICT segment: communications network equipment manufacturing, and in particular the manufacturing of fifth generation, or 5G, telecommunications networks, where two Chinese companies, Zhongxing

⁶⁶ Even before the Trump administration, such concerns were growing in the US, and the EU, and led to the strengthening of FDI screening regimes with regard to strategic risks associated with the loss of domestic ownership over sensitive technologies. This process included the broadening of the mandate of the Committee on Foreign Investment in the United States (CFIUS) through the Foreign Investment Risk Review Modernization Act (FIRRMA) in the US in 2018, and the institution of EU foreign investment screening mechanism in 2020. Japan also implemented a screening mechanism for inward Foreign Direct Investment (FDI) through an amendment to the Foreign Exchange and Foreign Trade Act to prevent foreign entities from obtaining sensitive technology in Japan through mergers and acquisitions.

Telecommunications Equipment Corporation, known as ZTE, and Huawei have become key global players in the 2010s.

The US government first became alarmed by the potential for China to gain panopticon and chokepoint capabilities through its heavy involvement in the 5G segment, and later on used export control on semiconductors, among other means, to prevent these companies from becoming central to the operation of global telecommunications networks in the near future (Segal, 2021, pp. 149–151). I will focus here on the semiconductor industry but provide a brief summary of the restrictions put on ZTE and Huawei below.

The US perception that ZTE, and Huawei pose security risks dates back at least a decade: Huawei's proposed equipment sales to US network operators ran political headwinds as early as 2010 (Barboza, 2010). A report released in October 2012 by the Intelligence Committee of the US House of Representatives argued that the entry of ZTE and Huawei into the US telecommunications equipment market poses potential national security risks as "China has the means, opportunity, and motive to use telecommunications companies for malicious purposes" such as installing so-called backdoors into Huawei equipment which can be used for information gathering activities. While the committee did not find concrete evidence of such backdoors or other vulnerabilities, it argued that "suggested "mitigation measures" cannot fully address the threat posed by Chinese telecommunications companies providing equipment and services to United States critical infrastructure." In light of this, the report stated that ZTE's and Huawei's entry into the US market should be viewed with suspicion and US network providers "are strongly encouraged to seek other vendors for their projects" so as to alleviate the risk of unauthorized foreign access to US digital infrastructure (Rogers & Ruppertsberger, 2012).

ZTE was placed on the US entity list in March 2016, after the US Commerce Department alleged that the company reexported controlled items to sanctioned countries—Iran, and North Korea—contrary to US law. ZTE reached a settlement with the US government in March 2017, and paid a US\$1.19 billion penalty, which was the largest fine imposed by the US Department of Commerce's Bureau of Industry and Security at that time. In April 2018, however, the US government enacted a denial order against ZTE, as it found that the company had violated the terms of its settlement. The seven-year denial order resulted in export controls which prevented ZTE from acquiring American components and services. This led to a halt in ZTE operations, as the company

became unable to produce telecommunications equipment given its reliance on US intermediate inputs. In May 2018, President Trump announced that he had instructed the US Commerce Department to lift the denial order after talks with Chinese president Xi Jinping. Subsequently, the US Department of Commerce reached a new settlement with ZTE, which involved a US\$1 billion fine and a US\$400 suspended penalty. The US Commerce Department was also authorized to monitor ZTE's compliance with the US export control regime for ten years. This led to the lifting of the denial order in July 2018.

Half a year after the ZTE settlement, the US authorities launched similar action against Huawei. Meng Wanzhou, Huawei's Chief Financial Officer and the daughter of Huawei founder Ren Zhengfei, was arrested in December 2018 on a US warrant in Canada in connection with Huawei's alleged operations in Iran circumventing US sanctions. In January 2019, the US Department of Justice charged Meng and Huawei with 23 indictments for alleged theft of trade secrets, and fraud. In May 2019, President Trump signed executive order 13873 on 'Securing the Information and Communications Technology and Services Supply Chain,' which declared a national emergency on the basis of "foreign adversaries are increasingly creating and exploiting vulnerabilities in information and communications technology and services," and prohibited for US firms the acquisition or use of such technologies from companies located in a "foreign adversary" (Exec. Order No. 13873, 2019).

A few days later, Huawei was added to the US Department of Commerce's Bureau of Industry and Security Entity List, which meant that the American vendors selling parts, components, services, or technology to Huawei needed to apply for special export licences to continue to be able to do business with Huawei. In August 2019, the Commerce Department added international 68 affiliates of Huawei to the entity list. However, as Huawei uses few direct components from the US, the damage of the first wave of restrictions was mostly limited to the company's inability to run Google software on its smartphones, and some suppliers such as Intel received licenses for exports to the Chinese firm.

At the same time, Huawei began stockpiling essential components such as capacitors, integrated circuits, flash memory, and camera-related parts, and asked foreign suppliers to expand their production in China well before the strengthening of the sanction regime, which blunted the immediate effect of the US action on the company's operations. In the face of US restrictions, the Chinese state provided further support for

the company, as Huawei was central to China's aim to develop a high-technology economy (Segal, 2021, pp. 157–159).

In 2020, the US Commerce Department issued several further restrictions aimed at limiting Huawei's supply to foreign semiconductor products. In May 2020, it announced an amendment to its foreign-produced direct product (FDP) rule and the entity list to limit Huawei's ability to acquire US software and technology used in the manufacturing of semiconductors from third countries (US Department of Commerce, 2020). In August 2020, the FDP was amended once again to include semiconductors manufactured in third countries with the use of US technology in its export control regulations (Shepardson, Freifeld, & Alper, 2020). Moreover, in December 2020, the largest Chinese contract chipmaker by output, Semiconductor Manufacturing International (SMIC) was put on the entity list, for the US government accused it of being connected to China's military, the People's Liberation Army (Reuters, 2020).

This led to supply shortages at Huawei for the most advanced chips used in their smartphones. The chip shortages and other Western formal and informal measures limiting the international business ties of Huawei led to declining revenues in 2020, and in all regions outside China the firm saw significant losses (Kirton, 2021).

This situation did arise even though the United States does not produce the most advanced chips domestically and is not a dominant chip exporter and supplier. In fact, most of Huawei's inputs were sourced from Taiwan, from the Taiwan Semiconductor Manufacturing Corporation (TSMC), which acts as a contract manufacturer for chip designers. Less advanced chips used in Huawei devices were manufactured by Hisense, Huawei's own chipmaking subsidiary, but this company was also sanctioned as part of the US crackdown and consequently could not obtain essential technologies related to semiconductor manufacturing.

The reason for which the restrictions on ZTE and Huawei were effective in disrupting the company's operations has to do with the structure of the sector and the US chokepoints in the design and manufacturing process of semiconductors, which are briefly summarized in the next section.

5.2.3 The IPE of the semiconductor sector

5.2.3.1 *The production stages and major firms in the sector*

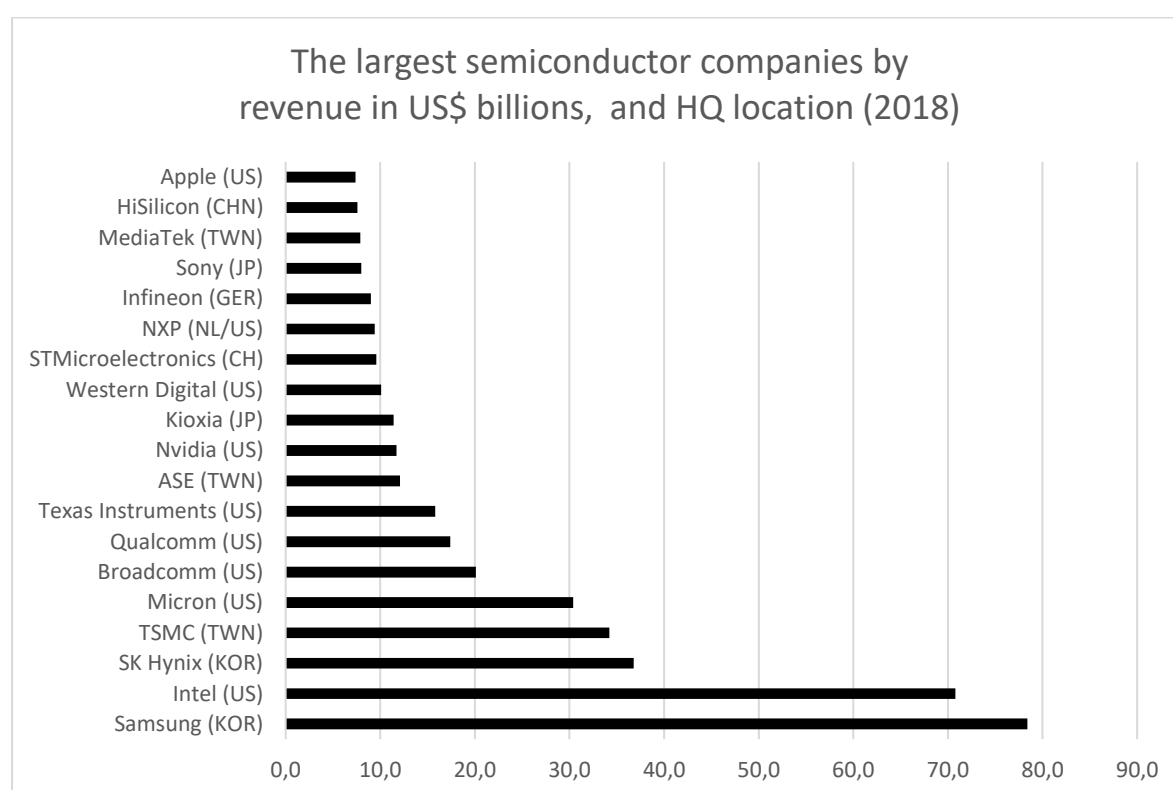
Semiconductor fabrication is the epitome of what Antràs (2021) termed 'hyper-specialization' in GVCs. The sector is heavily knowledge-intensive, requires the utmost

precision in manufacturing, dominated by short product cycles, and susceptible to boom and bust cycles, while offering meagre profit margins due to intense competition and buyer power (OECD, 2019, p. 12). This has created a situation in which economies of scale and technological advantage in processes are very important. In this environment, the market pressure forces companies to focus on their most important strengths, which leads to a situation where a smaller number of firms occupy niche sectors of the market.

The value chain is made up of five larger general segments. The upstream segment consists of research and development activities. Part of this segment is made up of non-competitive activities, such as general research on semiconductors in academia. Another part of the upstream segment consists of the applied profit-based research and product development activities. Based on data from the OECD, semiconductor production is one of the most research-intensive industrial activities, with companies in the sector spending 16 percent of their revenues on R&D in 2014. The middle segment is made up of chip design, manufacturing, and assembly. The downstream segment involves the assembly, or packaging, of the integrated circuit in electronic devices (OECD, 2019, p. 13). The development of the sector meant that since the 1990s, production rapidly declined in Western countries and East Asian makers began to dominate manufacturing, whereas US and European companies have concentrated on the downstream segments. An overview of these segments is presented in Appendix IV.

The economics of semiconductor design and manufacturing led to the development of new business models in the sector, with important IPE implications. In the 1980s, the semiconductor value chain was largely controlled by vertically integrated conglomerates. At present, there are both vertically integrated large entities in the sector, such as Intel, and Samsung, which possess numerous production segments in-house, but due to the economics of global production outlined in the previous chapters, distribute their operations in many countries. On the other hand, there are also horizontally disintegrated models of production, such as the model followed by Apple, which uses the services of contract manufacturers such as TSMC to produce its chips. This is known as the “fabless” model, where the chip designers do not possess fabrication capabilities.

Figure 28. The largest semiconductor companies by revenue and HQ location in 2018.



Source: OECD (2019).

Today, the industry is dominated by a handful of larger players. The large vendors are all headquartered in advanced economies, mostly South Korea, the US, Singapore, Japan, Taiwan, Germany and Switzerland. The largest foundries, which are contract manufacturers producing chips for designers who do not have their own manufacturing capacities, are mostly concentrated in East Asia, with Taiwan the market leader. The largest Chinese player in this segment is SMIC, which had a 5 percent market share by revenue in 2018 (OECD, 2019, pp. 22–23). Hence China is not a major player in this sector, as detailed in the next sections.

5.2.3.2 Chokepoint effects in semiconductor fabrication

The hyper-specialization means that large vendors are reliant on a high number of specialized suppliers. According to an example provided by the US Semiconductor Industry Association (SIA), a large vendor can rely on as much as 16 thousand suppliers, with 7,300 of those located in 46 different US states, and 8,500 of them located outside of the US (SIA, 2016, p. 3). In certain tasks, however, the market is dominated by a handful of these suppliers. One of such tasks is software design.

Integrated circuits are predominantly designed with automated software, where three US companies—Synopsys, Cadence Design Systems and Mentor Graphics—have

a combined market share over 90 percent.⁶⁷ Another such task involves chip design and chip architecture. The leading chip architecture developer, ARM is headquartered in the United Kingdom, and presently owned by Softbank, a Japanese holding, which, as of 2021, is in the process of selling the firm to Nvidia, an American chipmaker. A third segment where US companies dominate is the sales of precision tools and processing equipment used in semiconductor fabrication. Little-known specialist American companies such as KLA-Tencor, Applied Materials, Lam Research, and Teradyne control important parts of this sector.

From the perspective of IPE, this means that the sector is harder to control by state actors, and it requires considerably more care and dexterity to craft policies which are able to lead to the desired effects than in the 1980s, when the Japanese government could be coerced bilaterally into restricting exports. On the other hand, there is an abundance of potential bottlenecks and chokepoints in the value chain which can be weaponized unilaterally through domestic action. These chokepoints mean that if the US strictly enforces the licensing requirements and bans the sale of American technology to Huawei, the large majority of chips cannot be sold for the company given the US technology content involved in manufacturing and designing them.

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Other important chokepoints are located in other advanced economies. The most important part of semiconductor manufacturing is the process of photolithography, during which the integrated circuit itself is printed on the semiconductor wafer through the emission of light. Since this process requires nanometer-level precision, unique machinery is required to perform it. On the market of the most sensitive photolithography machine, as Dutch company, ASML holds a market share over 90 percent.

⁶⁷ Although Mentor Graphics was purchased by German MNE Siemens in 2017, it is headquartered in the US, and as such, is under the purview of US law.

Further chokepoints involve downstream segments of manufacturing. In some chemicals used for semiconductor manufacturing, Japanese firms are dominant: Japan produces about 90% of fluorinated polyimide and 90% of photoresists, two elements integral to the manufacturing process (Park & Yamazaki, 2019).⁶⁸ In other chemicals, German and French suppliers are hard to circumvent.

Similarly, technological patents held by US companies are essential for many fabrication and design processes. 47 percent of the revenues in the sector end up with US companies, while only 12 percent of the output by volume is manufactured in the United States (Handwerker, 2021), reflecting the importance of intellectual property in chipmaking, as well as the strength of the US R&D activity in this segment. In summary, the US leverage in this sector is very considerable in the sector.

5.2.3.3 China's import vulnerabilities

The US leverage is amplified by the fact that Chinese domestic capacity in integrated circuit fabrication is severely underdeveloped compared to the country's political ambitions, yet Chinese demand for chips is very substantial.

China is by far the world's largest importer of integrated circuits, with foreign supply reaching US\$312 billion, or 15 percent of gross Chinese imports in 2018, with imports to Hong Kong representing an additional US\$156 billion USD. China represents 25 percent of global semiconductor demand. Domestic supply lags far behind, however, and only accounts for 14 percent of local demand. This includes Chinese fabrication sites run by foreign companies including Intel, TSMC and SK Hynix of South Korea. In spite of the considerable foreign investment in Chinese manufacturing sites, Chinese semiconductor exports amounted to only US\$102 billion in 2019, around one-third of the import value.

It should be noted that this demand is not entirely domestic: as presented in Chapter 4, China is an important hub of the electronics IPNs, thus over half of these chips are re-exported from China once assembled into electronic devices (OECD, 2019, p. 29). This does not negate the importance of Chinese reliance, however: as the electronics industry is one of the most important domestic and export industries in China, access to the most valuable parts of electronic devices constitutes a strategic issue.

⁶⁸ This chokepoint was involved in another recent trade dispute between Japan and South Korea, when Tokyo removed South Korea from its export whitelist of countries where sensitive materials can be exported without license requirements.

China reacted to the vulnerabilities posed by this situation many years ago. The promotion of indigenous semiconductor technology was a central element of the ‘Made in China 2025’ development program announced in 2014, which allocated US\$120 billion worth of investment for domestic companies in order to be able to satisfy at least 70 percent of local demand by 2025. China established a National Integrated Circuit Fund in 2014 with an investment funding of US\$23 billion, and further regional funds supplementing this. Chinese acquisitions of foreign semiconductor companies underwent a rapid rise between 2015 and 2017, during which years Chinese companies spent the most on cross-border transactions in the sector. Furthermore, the Chinese government has initiated tax breaks for semiconductor R&D and lowered tariff rates for intermediaries used for output. While most chipmaking companies receive government subsidies around the world, in terms of the rate of subsidies to revenues, SMIC and a state-owned Chinese foundry, Tsinghua Unigroup, and a smaller Chinese vendor, Hua Hong are among the highest recipient of state aid (OECD, 2019, pp. 40–43, 64–67). Across the sector, 43 percent of registered capital (totaling US\$51 billion) in the Chinese semiconductor industry is directly or indirectly owned or controlled by the Chinese state, which signifies the extent of state involvement in the development of the industry (SIA, 2021).

These investments yielded an expansion of Chinese production, although mostly at the lower end of the technological spectrum. Chinese companies have a combined market share of 38 percent in assembly, packaging, and testing, or in other words, the finishing stages of production. On the other hand, their share in semiconductor wafer fabrication is only 16 percent, while 13 percent in the production of materials for semiconductor manufacturing, and 2 percent in manufacturing equipment production (SIA, 2021). This is in sharp contrast to other manufacturing sectors, where—as outlined in the sectoral data in Chapter 4—Chinese companies tend to be influential in the production of upstream goods such as materials, as well as manufacturing equipment.

Whether the state-led efforts aimed at propelling China to the technological frontier will be successful is hard to judge, but as of 2021, they are far from fruition. Tsinghua Unigroup missed bond payment deadlines in 2021, suggesting that the firm is in financial difficulty in spite of the considerable amount of state aid it had received. SMIC, meanwhile, is currently producing logic chips 14-nanometer transistors, which are very far from the technological frontier. The most advanced firms on the market are currently mass manufacturing 5-nanometer circuits and are planning to reach 3-

nanometer size by 2022. The 14-nanometer size was reached by the industry leaders in 2014, hence assuming linear progress, SMIC is seven years behind the frontier. In the case of DRAM memory, the technological frontier is at 14nm, while China is producing 19nm chips. In 3D NAND flash storage memory chips, the most advanced companies are producing 176 layer devices, while Chinese companies are producing 64-layer storage (SIA, 2021). This means that even though China is catching-up in volume on the lower end of the technological spectrum, Chinese companies are years behind the market leaders in most chip segments.

5.2.4 The reasons behind the effectiveness of US chokepoints

The effectiveness of the US restrictions stemmed from three factors. First, as described above, US companies were in possession of technologies which are essential in the value chain. Thus, US power to levy costs on China resulted not from direct supply links but through certain third-party US contractors, which enjoy dominant positions in some of the ‘chokepoints’ of semiconductor—or more precisely in this case, integrated circuit—manufacturing. These chokepoints mean that if the US strictly enforces the licensing requirements and bans the sale of American technology to Huawei, the large majority of chips cannot be sold for the company given the US technology content involved in manufacturing and designing them.

In this regard, relatively small companies such as KLA-Tencor, Applied Materials, Lam Research, and Teradyne assume substantial strategic value. The second wave of restriction on the sale of manufacturing equipment to Chinese companies meant that they could no longer access US chokepoint technology and were unable to produce high-end semiconductors.

Second, Chinese companies are far from the technological frontier in semiconductor fabrication, and even though they are catching up in production volumes on the lower value-added segments of the value chain, rely heavily on importer foreign inputs. This, coupled with the aforementioned US chokepoint effects, meant that the third wave of US measures, which involved restrictions on selling semiconductors manufactured with the usage of US technology by third-country vendors, effectively hamstrung the access of targeted Chinese companies to high-end microchips globally.

Third, the US leveraged other forms of network power to ensure the efficiency of these restrictions, in stark contrast with the case of the ‘trade war.’ Apart from the

utilization of chokepoints, the US was able to credibly threaten firms located in third countries, and in many cases with scarce direct business interest in the US to halt their business with Huawei, and ZTE, and later on with SMIC. This is not only due to the importance of the US market for the final consumption of electronics, whereby the loss of market access represents a credible threat from the US government towards third country-firms; but also due to the centrality of the US in the global financial system and the wide reach this gives to the US Department of Commerce in pursuing companies overseas which it seeks to sanction. Essentially, the US was able to institute extraterritorial export controls on technology due to its network power.

The US' political leverage played a significant role as well. Huawei's business suffered after the US pressured its allies to ban Huawei equipment from domestic telecommunications networks or at least limit their usage. In addition, the case of ASML is another clear piece of evidence in this regard. Due to its importance to the Dutch industry, ASML routinely receives export licenses to sell photolithography equipment to China. However, the US government "mounted an extensive campaign" to block the sale of one of the company's most advanced machines to a Chinese buyer, which involved lobbying from then Secretary of State Mike Pompeo towards the Dutch government. In this particular case, ASML ended up letting its export license lapse in 2019, and the targeted machine was not exported to China, even though the company continues to do business with Chinese clients with less advanced equipment (Alper, Sterling, & Nellis, 2020).

5.2.5 The trade-offs of exploiting chokepoints

While weaponizing the US chokepoints to gain advantage over Chinese weaknesses have certainly worked in disrupting the operations of Huawei, and ZTE, this strategy nevertheless led to unintended consequences and domestic trade-offs which raised the costs of exploiting the chokepoints after the fact.

5.2.5.1 *Unintended consequences of chokepoint effects: the 2020–2021 semiconductor shortage*

At the time of the submission of this dissertation, one of the most pressing problems of GVCs, and consequently, that of the whole world economy is a shortage of semiconductors, mostly microchips used in the auto industry and electronics manufacturing.

As the microchip shortage experienced during the COVID-19 pandemic in 2020–2021 has shown, semiconductors are the most fundamental elements of the IT industry and are becoming ever so important in a global economy characterized by increasing digitalization and automation. The COVID-19 disruptions have also shown that semiconductor fabrication is not only one of the most advanced forms of manufacturing, but consequently it is also one of the most sensitive GVCs given the large number of highly specialized inputs required, and the large number of suppliers and economies involved in the value chain.

This shortage is a result of a number of unprecedented and unforeseen consequences resulting from the COVID-19 pandemic. One of these unprecedented shocks concerns logistics. At the onset of the pandemic in early 2020, many Chinese electronics factories closed down so as to mitigate the spread of the COVID-19 virus, which led to supply bottlenecks. During the spring and summer of 2020, many other countries had to institute partial lockdowns, and factories closed in numerous European and Asian economies. This has led to supply shocks in many industries, and the world has experienced temporary shortages of many essential products ranging from toilet paper to medicine.

At the same time, a demand shock hit the world economy as well due to the shift in consumption patterns. In the first stage of the pandemic, lockdowns led to a sharp increase in unemployment, which obviously decimated aggregate demand for non-essential durable products such as cars. The lack of demand exacerbated the problems created by factory closures, and further decimated production.

However, as the pandemic progressed, in the US and the EU governments reacted to the rising joblessness with generous unemployment and welfare policies, which then raised disposable incomes across the Western world even in a face of recession. At the same time, the services industries such as hospitality and tourism were decimated due to the pandemic, as personal contact among people was deemed risky and in many countries was discouraged or outright banned in many situations through social distancing policies. Consequently, a considerable share of increased disposable income ended up flowing to durables such as home entertainment devices. The risk of in-person contacts also raised the demand for cars. In addition, companies were forced to initiate teleworking schemes, which raised the demand for electronics.

Thus, in the first stage of the pandemic, the demand for motor vehicles declined substantially in Western countries, whereas the demand for electronics has grown due to

lockdowns forcing the widespread adoption of telework and home entertainment electronics. This meant that chip producers have started to shift their capacities to the increased demands in electronics and reduced the output of the more basic chips designed for the auto market. When the lockdowns have eased in the Fall of 2020, demand for passenger vehicles rose, and at first, production recovered. However, the shifts in the chip demand have led to shortages for auto makers, for chipmakers had already booked their capacity with electronics manufacturers.

The rise in demand coincided with the breakdown of logistics. Container shipping, which is the backbone of global trade, could not keep up with the increased demand for a number of reasons. First, before the COVID-19 pandemic, the sector was undergoing a long process of consolidation. The roots of this process go back to the 2008–2009 crisis. Global trade had experienced an enormous boom in the 2000s, which led to the rapid expansion of container vessel fleets and ports. After the crash, trade had collapsed, and even though trade volumes recovered by the 2010s, the pace of trade growth came to a near-halt, and the world economy faced ten years of “slowbalization”, or slow trade growth (Antràs, 2021). As a consequence, shipbuilders and shipping companies which were betting on the continued expansion of trade, and borrowed heavily to invest in expanding their capacities, faced increasing financial hardships. One of the prime examples of this was the default of South Korean container carrier Hanjin in 2016, the year which was the low point for the sector financially. In summary, container shipping was already strained by 2020 for reasons unrelated to the pandemic.

Another source of logistical problems stemmed from the geographic shifts in demand. As discussed previously in this dissertation, it is a long-standing feature of global trade that East Asia runs a trade surplus with the Western world. As a result, container ships carry more load from Asia to Europe and the US than the other way around. However, they normally load up empty containers and ship them back to Asia for later use. When the COVID-19 pandemic hit and Europe, and the United States faced shortages of essential products from Asia, ships began to head back empty from the American and European ports to Asia, so as to save the time it would have required to load up the empty containers. Over a couple of months, this has led to a container shortage in East Asian ports, which limited the supply of products, and consequently also that of parts and components for East Asian production networks.

A related problem was that shipping companies seized the opportunity to recoup the losses suffered in the previous years and raised their prices considerably to take

advantage of the overdemand. This has led to prices reaching at times five-to-twenty-fold the normal rates between Asia and the United States.

Nevertheless, logistics was only part of the problem. As discussed in more detail in the following sections, semiconductor fabrication is a knowledge and capital-intensive sector where manufacturing requires utmost precision. This presents a limit on the expansion of production capacities: factories take years to set up, and existing facilities are usually utilized close to their maximum. Moreover, the sector is heavily fragmented with a large number of specialized vendors and suppliers, which means that the number of potential bottlenecks is considerable.

A further problem arose from the political economy of the sector. While the demand for cars, and consequently for microchips used in cars had increased dramatically, electronics manufacturers enjoyed a better bargaining position in the race for chips than carmakers. First, the microchips used in consumer and business electronics products are generally more advanced than those used in the auto industry, which means higher prices and higher margins for semiconductor vendors. Moreover, large electronics makers usually work directly with the semiconductor vendors, and given the scale of their operations, can make continued large purchases. Automakers, on the other hand, generally do not deal directly with semiconductor manufacturers but buy their components from smaller vendors specialized in auto chip design, such as NXP or Renesas. These comparatively smaller design houses generally contract out the manufacturing of their microchips, thereby essentially acting like middlemen in the process between the semiconductor makers and the carmakers. In this setting, their bargaining power is limited.

Hence, semiconductor manufacturers prioritized the fabrication of more advanced electronics chips, which, coupled with the constraints on their production capacities, exacerbated the crisis of the auto industry, and led to idling factories, dwindling GDP numbers, and political wrangling over semiconductor manufacturing from Germany to the US to Japan.

On top of all the issues discussed above, the chip shortage was severely exacerbated by the trade war, the US restrictions on semiconductor exports, partly through the knock-on effects of the license requirements placed on SMIC, partly through the general instability in the industry these measures have created.

The first, US\$34 billion tranche of the Trump tariffs in 2018 impacted US semiconductor imports from China, thus the import costs for US companies have already

risen substantially prior to the beginning of the export restrictions placed on Chinese semiconductor manufacturers. This has led to a sharp, 50 percent decline in semiconductor exports from China to the US. The decline in Chinese supply was not replaced by other import sources, however, since the sector was already at capacity due to other factors noted below (Bown, 2021c).

The second aspect where the US trade war aggravated the semiconductor shortage was the sanctioning of SMIC. Chinese chipmakers operate on the less technology intensive segment of the market, they are key suppliers of low-end chips used in abundance in automobiles and home appliances, where the performance requirements for most chips are lower. SMIC is a key producer in this segment, thus the restrictions placed on the company worsened the semiconductor shortage: SMIC was curtailed in expanding its operations at a time when demand was rising, while its buyers were capacitated by the US export restrictions to look for other suppliers in a time of crisis (Klayman & Nellis, 2021).

A third source of disruption was the aforementioned stockpiling of chips by Huawei. In reaction to the first sanction, and in anticipation of more severe restrictions on its operations, Huawei booked in advance substantial manufacturing capacities at contract manufacturers. At the same time, other manufacturers, which were betting on being able to expand their market share due to the sanctioning of Huawei, also increased their semiconductor purchases so that they would be able to satisfy the potentially growing demand (Klayman & Nellis, 2021). These two processes have in turn crowded out other buyers from the market prior to the pandemic, first and foremost the smaller design houses described above, which are nevertheless still integral parts of the auto manufacturing value chain.

In summary, the Trump tariffs did work as intended by limiting Chinese supply, but at the same time did not lead to a reorganization of the sector due to the high capital intensity and the long lead times of semiconductor investment, as well as the high demand on the global market.

5.2.5.2 The domestic trade-offs of chip restrictions

A more glaring trade-off concerns the global interdependencies in the value chain, and the domestic political economy of the semiconductor trade war. While US companies were lobbying heavily for sanctions vis-à-vis East Asian competitors in the 1980s and the 1990s, this was not the case during the current semiconductor trade frictions. Quite the

contrary, US semiconductor companies have lobbied the US government in order to alleviate the restrictions on their Chinese sales and to be granted licenses to be able to continue to deal with Chinese partners (Nellis & Alper, U.S. chipmakers quietly lobby to ease Huawei ban, 2019).

This is the consequence of the Chinese market power: while on the one hand, China's reliance on semiconductor imports is certainly a vulnerability, its role as the main hub for electronics manufacturing means that it is also the largest market for semiconductor companies in the US, and Asia. The Chinese market accounts for 56 percent of revenues for Qualcomm, 33 percent for Broadcom, 26 percent for Intel, and 24 percent for Samsung (Sheng, 2021). In 2019, Huawei alone spent US\$70 billion on procurement, out of which US revenues comprised US\$11 billion (Nellis & Alper, 2019).

According to data released by the US House of Representatives in October 2021, the US Commerce Department issued 113 export licenses worth US\$61 billion for suppliers of Huawei, and another 188 licenses valued at US\$42 billion were granted for SMIC between November 2020 and April 2021. Over 90 percent of license requests were granted to SMIC suppliers and 69 percent for Huawei suppliers (Freifeld & Alper, 2021). This is in addition to previously granted licenses under the Trump administration to suppliers of the two companies, which amounted to an export value of US\$87 billion (Freifeld, 2021).

While most of these licenses were granted for less advanced chips, the continued US exports to the two companies nevertheless meant that their operations could continue, albeit at a somewhat diminished capacity. Moreover, other Chinese companies continued to access US goods and technology with relatively few administrative constraints. This is evidenced by the fact that the Chinese imports of semiconductors and semiconductor manufacturing equipment continued to increase after the institution of restrictions on Huawei, and SMIC. US semiconductor and semiconductor equipment exports to China rose substantially and were well above baseline values since 2018. In semiconductors, compared to the baseline of US\$10.8 billion, US sales were at US\$22.2 billion between the beginning of 2020 and the end of October 2021. In semiconductor equipment, the baseline was 4.6 billion, while the actual purchases amounted to US\$10.8 billion (Bown, 2021b).

Overall Chinese trade data shows similar trends. While 2019 saw a moderate decline in import values to US\$304 billion, 2020 brought a substantial increase even in the face of increasingly restrictive US measures, to US\$378 billion, or 18 percent of total

gross Chinese imports. Chinese imports of semiconductor manufacturing equipment amounted to a further US\$32 billion and have stayed steady since 2018. Chinese semiconductor export also rose from US\$102 in 2019 and US\$116.6 billion in 2020.⁶⁹

In addition, Chinese chip production have grown by 16.2 percent in 2020, surpassing the already significant growth rate of 7.2 percent a year before (Borak, 2021). This is driven by the fact that state support, coupled with the generally lower production costs in China led to very favorable price competitiveness for Chinese manufacturers in the lower-end segments. The Boston Consulting Group has estimated that building and operating a fabrication operation in China costs 37 percent lower than in the US (SIA, 2021). This dynamic has not been changed by the trade restrictions. In fact, the Trump tariffs and the choking of Huawei and SMIC only reiterated the importance of self-reliance for China. In this sense, a counterargument for the US policy on semiconductors posits that by exploiting China's strategic vulnerabilities, the US forces China to invest more resources towards innovation in sectors and segments in which it otherwise would not have had to compete with America (Wang D. , 2021). Hence, US policy provides an important impetus for Chinese self-reliance and technological progress, and consequently, reduces the US' strategic advantages vis-à-vis China stemming from chokepoint effects.

In summary, the US export restrictions were effective hindering the technological progress of key Chinese companies, while simultaneously creating major global repercussions which ended up causing economic harm to the US itself and were also ineffective in shutting out China from the global markets and causing long-term harm of the Chinese semiconductor industry as a whole. The latter is the reflection of the fact that the costs the US industry, and consequently, the US government was willing to bear in order to reach its strategic goals were limited

One political economy interpretation of these numbers is that the US semiconductor industry remains a potent lobbying force, and as the Chinese market represents an important and growing slice of its revenues, it mobilized its political clout in Washington to receive exemptions from the export restrictions.

Another, broader political economy implication concerns the second order effects. If the US semiconductor companies lose their Chinese revenues, they will lose their ability to invest in R&D and maintain their technological base, while their foreign rivals

⁶⁹ It should be noted that some of the rise in trade values can be attributed to the fact that the unit prices of semiconductor products rose substantially, although much of the increase happened in 2021.

might capture a growing market share and out-innovate them. This would in turn reduce US domestic competitiveness, and consequently diminish the US chokepoint power. Hence, while the utilization of the US chokepoints provided short term results in the specific case of the two targeted companies, in the longer run, the punitive economic measures might prove to be less effective, and at worse from a US perspective, even self-defeating.

5.2.5.3 The emergence of global semiconductor competition

The trade war and the microchip shortage has also invigorated the sense of vulnerabilities inherent in contemporary GVCs in Europe, the US, and Japan, and led to a renewed focus on the promotion of strategic manufacturing industries and technological self-sufficiency.

After the election of Joe Biden as US president in 2020, the new administration kept the restrictive policies on Chinese semiconductors, as well as the tariffs previously levied by the Trump administration, intact. At the same time, the administration and the US Congress began to move forward plans to foster domestic manufacturing so as to combat the shortages and the supply chain vulnerabilities.

Even during the Trump administration, the US government invited the leading Taiwanese contract manufacturer, TSMC to build a production base in Arizona, where work on the factory has begun in 2021 (Reuters, 2021). The Biden administration launched a strategic supply chain review after taking office, which found in June 2021 that the loss in domestic manufacturing capacities represented a strategic risk to the US.⁷⁰ For this reason, the White House requested US\$50 billion in R&D funding for the semiconductor industry from Congress, envisaged the strengthening the manufacturing requirements of federal technology grants, and tightening the rules of government procurement rules so that a 75 percent domestic value-added is required for goods purchased by the US government (White House, 2021a). The US Senate subsequently passed the United States Innovation and Competition Act (USICA) authorizing US\$52 billion in funding for incentives aimed at invigorating semiconductor production and R&D, and promoting sectoral synergies through the establishment of national programs

⁷⁰ The US share of semiconductor manufacturing was 37 percent in 1990, which shrank to 12 percent by 2020.

and initiatives for coordination. However, as of December 2021, the USICA was not put to a vote in the US House of Representatives.

Moreover, the Biden administration in early 2021 proposed a ‘technological alliance among like-minded countries’, which would apparently involve creating a semiconductor value chain with Taiwan, South Korea, and Japan (He T. , 2021).

Similarly, the European Commission also launched a supply chain review in the aftermath of the COVID-19 disruptions, which highlighted the market distortions brought about by Chinese state subsidies in the sector, the lack of level playing field, and the aforementioned geopolitical tensions, the lack of high-end factories in Europe, and the high reliance on Asia for advanced logic chip fabrication and on the US for design tools as sources of vulnerabilities (European Commision, 2021a, pp. 82–89). Subsequently, the European Commission launched the so-called Alliance on Processors and Semiconductor Technologies in July 2021, which is an institution aimed at fostering cooperation and collaboration between the EU institutions, member states, and firms working in the semiconductor industry so as to streamline financing and better allocate resources (European Commission, 2022). In September 2021, Commission president Ursula von der Leyen announced the aim to create a “European Chips Act” to enhance the EU’s position in the global semiconductor race (Cerulus, 2021). The Commission was also involved in courting foreign companies to relocate their operations to Europe, which is spearheaded by the effort to bring a state-of-the-art Intel foundry to the continent (Nellis & Waldersee, 2021). In addition, the EU and the US inaugurated a joint Trade and Tech Council (TTC) in September 2021 as a forum for cooperation in emerging technologies (European Commission, 2021b).

The Japanese government has also been paying growing attention to supply chain vulnerabilities and economic security. In June 2019, the Ministry of Economy, Trade, and Industry (METI) set up an economic security office, while in October the same year the foreign ministry established an office dealing with new national security issues, among them economic security. In April 2020, the National Security Secretariat created a bureau for economic security as well, which focuses on the threats posed by China’s acquisition of high-end technologies and its civil-military fusion activities, among other issues (Nihon Keizai Shimbun, 2021).

METI published the “Strategy for Semiconductors and the Digital Industry,” which stated that the lack of state-of-the-art chipmaking capabilities, the vulnerabilities stemming from the fragmented nature of the semiconductor value chain, industrial

policies in other countries eroding the relative competitiveness of Japanese producers, and the increased competition for semiconductor technology among the US and China are vital challenges for Japanese economic security. The strategy thus outlined four priorities for the government to safeguard Japanese interest, namely the promotion of the production of cutting-edge logic semiconductors, the acceleration of digital and green investment, the strengthening of the domestic design and development infrastructure, and the broadening of the portfolio of Japanese semiconductor makers and the development of the domestic base of chokepoint technologies. The first of these appears to come to fruition with the announcement of a JP¥1 trillion chipmaking factory to be established in Kikuyo, Kumamoto prefecture by TSMC.

Whether these programs would prove to be successful is questionable however, as they involve economic trade-offs which barely feature in the political discourse or the emerging IPE literature on the subject, such as Segal (2021). The first problem concerns the efficacy of ‘industrial policy,’ or in other words the notion that state investment will lead to better outcomes from a strategic perspective than market-based solutions.

The effectiveness of such policies is not clearly supported by the economics literature. Albeit it is a widespread notion in political science that East Asia’s economic development was a result of interventionist industrial policies and public subsidies for strategic sectors—what is termed the ‘developmental state’—, the evidence for the economic benefits these policies has generated is at least mixed (Harrison & Rodríguez-Clare, 2010). Moreover, recent evidence shows that Chinese industrial policies aimed at fostering the development of domestic industry are in some cases not effective (Barwick, Kalouptsi, & Zahur, 2019), and the success of industrial policies in the age of IPNs rest on an abundance of other variables (Liu E. , 2019). As a result, even economists who hold a favorable view of state-led initiatives argue that in the 21st Century, cutting-edge technological development is better supported by the development of a broader institutional base aimed at improving human capital and education, and business environment and competition, than interventionist industrial policies (Aiginger & Rodrik, 2020).⁷¹

Another, systemic effect which was mentioned in the case of the ‘trade war’ as well is the erosion of global norms. Many of the policies outlined in the developed

⁷¹ The notion that industrial policy goals are unrealistic in the absence of deeper structural adjustments is underpinned by the fact that the semiconductor sector in the US struggles with a labor shortage currently.

countries are contrary to WTO obligations regarding state aid and fair competition. In essence, high-income economies are fighting Chinese market distortions by creating new market distortions and undermining the rules to which they want China to conform. Such an economic arms race has historical examples which turned out to undermine global stability before (Kindlerberger, 1973).

6 Regional politics and economic interdependence

The primary aim of this dissertation is to make inferences about the determinants of trade and production sharing with regards to the contemporary politics of economic interdependence in East Asia.

From this perspective, the question arises: what sort of conclusions can we draw from the nature and determinants of regionalisation and regional interdependence from the perspective of regional politics? Naturally, the context in which this question arises is the systemic shift produced by the rise of China, and the apparent competition for regional (and increasingly, for global) leadership this process has unleashed. China's rise presents numerous political, security and economic hurdles both regionally and globally, and I would not endeavour here to provide an all-encompassing analysis or explanation.

Instead, I will deal with a more focused sub-issue in connection to the empirical findings of the previous chapter and the theoretical discussion preceding it to answer the third research question, which stated: *How did 'strategic competition' affect the sustainability of the regional economic order, and did it lead to the creation of a more self-contained economic order in East Asia?*

6.1 Leadership, institutions, and discord in East Asia

From the factors discussed in the previous chapters, some more practical observations can be derived with regards to the interplay between the institutional architecture of East Asian interdependence and international politics. First, China's rise is strongly tied to East Asian regionalisation, since the sources of its re-emergence on the regional and global stage were rooted in its rapid economic expansion, which in turn was fuelled by foreign capital and technology, and manufacturing activities within the East Asian regional production networks. The economic might of China, achieved within East Asian production networks, is both the source of Beijing's material power in international relations, and the source of its domestic legitimacy, and as such, the guarantor of regime stability. Second, not just China's, but the whole region's welfare and economic fortunes are closely linked to the effective operation of these regional networks. Third, as shown above, these regional networks, and more broadly, regionalisation depends heavily on three pillars: global trade rules, regional institutional depth, and the quality of governance on the national level.

Fourth, the nature of production-based regionalisation in East Asia has created a new form of international interdependence among regional economies, which is more

complex, more intertwined, than in the ‘classic’ period of 1970s–1980s interdependence research. This system of abundant interlinkages on the one hand provides a certain structural stability through the denseness of the networks and the quick adaptability they display; on the other hand, the lack of a single, central regulatory institution and the multitude and heterogeneity of institutional frameworks which produce the conditions for the operation of these networks mean that the system has its own special set of vulnerabilities.

Some of these vulnerabilities have been highlighted by the US–China ‘trade war,’ East Asia is facing a potent challenge to the stability of the trade rules which, as shown above, contributed significantly to its development, and as such, provides an important pillar in the stability of the regional production networks. US leadership and access to the US market have been fundamental elements in the success of East Asian regionalisation, and as such the sharp reversal of the US support for free trade and the WTO-system, and its focus on bilateral renegotiation since 2017 has certainly appended a main tenet on which East Asian stability and prosperity is built. On the other hand, it remains questionable if China is able and willing to provide the sort of economic leadership that the US produced before, or if the regional countries would in fact accept Chinese leadership in the first place.

As outlined in the previous chapters, I view the conditions of contemporary interdependence as both limiting and supporting leadership. On the one hand, regional states’ freedom of action is limited by the fact that disruptive political behaviour would threaten many of the institutional regulating features which produce the conditions making production networking, and thus regional development, possible. Threatening and disrupting the regional production networks would make a negative impact on the economic health of the whole region, and as a proxy, the domestic economy of the state(s) which engaged in disruptive behaviour to begin with. On the other hand, the asymmetric nature of the interdependent relationship yields power to those states which are in a better relative position within regional production networks. There are essentially two ways to look at this aspect. The first one, outlined in Chapter 4, is that the more powerful actor in an asymmetric relationship can manipulate the networks of production to achieve its political goals, and as such, could potentially use economic interdependence as a vehicle of power politics, as described by the weaponized interdependence research agenda.

The second, more benign aspect is that a leader can assume a stabilizing role. The most important element of leadership in this regard, as conceptualized by Kindleberger

(1973), is the ability to create financial and economic stability by supplying international public goods, acting as the lender of last resort, and absorbing the current account surpluses of regional states by consuming the finished products manufactured within the region to sustain regional production networks.

A salient question in this regard is how to uphold regional welfare in the face of the trade war. One concept, cited above, assumes that East Asia is decoupling from the rest of the world economy to shield itself from the external shocks, and is beginning to form a self-sustaining high-growth economic unit within global capitalism. Another conceptualization of the decoupling thesis looks at the issue from the other way around, and proposes that the US–China frictions, and more generally, the differences in strategic interests and economic models between China and established high-income countries, would lead to a managed weakening of the economic ties among them. A third outlook, also noted in previous chapters, is that the resilience of IPNs and GVCs mean that political frictions and short-term shocks are transitory, and the economic realities underpinning regional interdependence are strong enough to withstand the otherwise not particularly well-formulated policies aimed at breaking up value chains.

The next sections of this chapter examine these claims on two fronts. First, I conduct a statistical test to evaluate whether political frictions produce meaningful changes in economic outcomes in East Asia by looking at how the changes in political relations between states affect the level of interdependence between them. Second, I analyse the decoupling narrative from an empirical standpoint by calculating the changes in the global embeddedness of East Asian economies, and the relative development of the regional economic ties compared to the extra-regional ones over time.

The second part of the chapter focuses on the institutional underpinnings of the current regional order, and will examine the institutional strategies of China, Japan, and the ASEAN.

6.2 Interdependence, and political discord

6.2.1 Previous research

As noted in Chapter 4, most of the literature on interdependence in IR and IPE is concerned with the systemic effects of interdependence on militarized interstate conflict. Consequently, previous studies have mostly examined the relationship between these two variables on large-n samples.

In contrast, the question of this section is not if interdependence mitigates or heightens the risk of militarized conflict, but if political relations, and the changes thereof, produce measurable effects on the level of economic interdependence among regional states. This question arises within the context of political discord between the rising China and states interested in the maintenance of the *status quo*, in which case the risk of outright militarized conflict is considered to be generally low apart from the Taiwan strait, while trade frictions and calls for economic decoupling are increasingly severe.

The relationship between political frictions and interdependence is much less studied than the relationship between interstate conflict and interdependence, although there are a number of recent examples of such studies. Masterson (2012) analysed how China's political relations with its neighbours correlate with the level of their interdependence from 1987 to 2001 and found that trade interdependence is generally associated with political cooperation, but relative power increases are associated with political conflict. Masterson (2014) however, found in a larger model encompassing not only China's neighbours but 153 of China's trade partners in the years 1990–2004 that economic interdependence may reduce political cooperation. Mészáros (2015) examined the relationship between the asymmetry of economic dependence between the US and China, and their political relations based on data from the Global Database of Events, Language, and Tone (GDELT) dataset between 1978 and 2012, and found that as China's relative dependence on the US declines, political relations worsen among the two countries.

In a more sophisticated paper, Kleinman, Liu, & Redding (2020) utilized theoretical and empirical advances in trade research to calculate the sensitivity of welfare in one country to productivity growth in another country based on IO data and estimated how a growing reliance on foreign productivity growth on domestic welfare affects foreign policy *vis-à-vis* the partner country. The results showed that stronger reliance on a partner's productivity growth leads to an alignment in foreign policy behaviour towards the preferences of that partner. Nevertheless, the political relations in this conceptualization were based on data from UN voting patterns and 'strategic rivalries' between 1970-2012, which lessens the applicability for this dissertation.

6.2.2 Operationalization

In contrast to these approaches, I use a gravity model to estimate if changes in political relations substantially alter economic relations in East Asia and the Asia-Pacific.

I use three independent variables for political relations. Two of these are derived from the Integrated Crisis Early Warning System (ICEWS) database, which is a computer-generated database for international events data consisting of coded interactions between socio-political actors (Boschee, et al., 2015). In plainer terms, ICEWS data is coded from news articles by extracting the types of actors, the nature of the interaction, the geographical location, and other information from the articles.

The ICEWS dataset contains a so-called ‘Goldstein-scale’ value, operationalises interstate events on a scale ranging from -10 to +8.3, with -10 being a militarised attack, and +8.3 being the extension of military aid (Goldstein, 1992). The full Goldstein-scale is provided in Appendix V.

I used two measures based on these Goldstein-values to represent political relations: one is an average of the Goldstein-values of all interactions between the governments and militaries of two countries in a single year, and another is the standard deviation of the dyadic Goldstein-values for a given year. The first of these values is an approximation of the state of political relations among two countries. The second of these values represents the stability in relations: a higher deviation from the mean signifies that the relationship is more volatile, while a lower value signifies a more predictable dyadic relationship.

In addition, a third variable is used from Gurevich & Herman (2018) which represents the institution of sanctions between the two countries of a dyad. The dependent variable in the model is bilateral trade from Head & Mayer (2014). The gravity control variables are also obtained from the same database.

The panel data ranges from the year 1995 to the year 2019. The countries covered in the model are the APT and the US, for as outlined previously, the US is an important political and economic actor in the region. Moreover, the fact that there a need to calculate the relationship between trade and sanctions, and trade and political frictions in the first place, is largely a reflection of US foreign policy in East Asia.

The gravity model is based on the equation introduced in section 3.2.2, namely:

$$p_{ij}x_{ij} = \frac{Y_i E_j}{Y} \left(\frac{t_{ij}}{\prod_i P_j} \right)^{1-\sigma}$$

where $p_{ij}x_{ij}$ represents the bilateral trade value from country i to country j , Y_i represents the total sales of country i , E_j denotes the total expenditure of country j , Y is the sum of sales in the world, t_{ij} captures bilateral iceberg trade costs from country i to

j , P_j is an inward multilateral resistance term, $\prod_i$ is an outward multilateral resistance term, and σ is the elasticity of substitution. The model is estimated as follows:

$$\ln X_{ijt} = \alpha + \beta_1 \ln \text{Distance}_{ijt} + \beta_2 \ln \text{GDP}_{it} + \beta_3 \ln \text{GDP}_{jt} + \beta_4 \ln \text{GoldsteinMn}_{ijt} + \beta_5 \text{GoldsteinStd}_{ijt} + \beta_6 \text{Sanction}_{ijt} + \varepsilon_{ijt}$$

where X denotes bilateral merchandise trade export values between country i and j at time t ; $\ln \text{Distance}$ represents the natural log of the distance in kilometres between the two countries; $\ln \text{GDP}$ is the natural log of the GDP values of the two countries in a dyad in current US dollars; Goldstein is the mean of the Goldstein-scale values in a dyad in a given year; GoldsteinStd is the standard deviation of the Goldstein-scale values in a dyad in a given year; and Sanction is a dummy variable which takes the value of one if a country instituted sanctions against a trade partner in a given year, and zero if there were no sanctions in place.

6.2.3 Estimation results

The results are presented in the following table. As expected, the Goldstein-values representing political relations show a positive coefficient with trade, although the coefficient is not statistically significant in the second model. The standard deviations of the Goldstein values, representing the degree of volatility in political relations, have a negative coefficient, which is also according to expectations: a higher volatility (standard deviation) value represents more unpredictable relations, which are bad for business. Volatility is statistically significant in both models, although its effects are relatively modest. In addition, the third variable, the imposition of sanctions behaves as expected as well, and has a strong negative coefficient with regards to trade values.

From this data, it appears that political relations have a very limited effect on trade in East Asia and worsening political relations do not lead to a cessation of trade in the sample covering the years 1995–2019. Volatility in relations has a better explanatory value, although the effect is still modest. Sanctions do appear to work in disrupting bilateral trade, however.

This suggests that on the one hand, the East Asian trading relationships are durable and resilient in the face of political headwinds, and political frictions related to China's rise do not appear to deter regional states from trading with China (or any other potential adversary). This is in line with the research on the resilience of East Asian IPNs with regards to external shocks. On the other hand, the statistically significant negative effects for volatility and the sharply negative coefficients of sanctions underscore the

importance of stability and international rules for regional trade and show that if the trade wars are to continue, there are potentially more severe consequences in the longer term for East Asian economies.

It should be noted that these results do not contain the effects of the US–China trade war yet. Although the year 2019 is included in the calculations, a larger set of observations would be needed to discern such effects with any degree of statistical significance. Moreover, these results do not capture the potential time variations in the relationship between political variables and trade. In other words, while the impact of political relations on trade ties might be subdued across the whole time period surveyed, this might have changed in the contexts of the political discord experienced since 2018. Due to the limitations in more recent ICEWS data, the political variables are not available yet for 2020 and 2021. Moreover, as noted in Chapter 3 regarding the time lags required to identify the effects of FTAs on trade, it is reasonable to assume that many more years would need to pass for the potential effects of the trade war to show up in aggregate data.

Table 29. Estimation results of the gravity model.

VARIABLES	(1) OLS	(2) OLS
ln(Distance)	-1.030*** (0.035)	-1.043*** (0.043)
Exporter ln(GDP)	0.894*** (0.014)	0.957*** (0.017)
Importer ln(GDP)	0.779*** (0.014)	0.798*** (0.017)
Goldstein	0.053* (0.029)	0.053 (0.033)
Goldstein St. Dev.	-0.104** (0.133)	-0.098* (0.265)
Sanction		-0.927*** (0.131)
Constant	-21.500*** (0.507)	-23.432*** (0.608)
Observations	2,580	2,580
R-squared	0.704	0.700

6.3 Measuring decoupling

In this section, I look at whether there is a long-term economic decoupling of East Asia from the rest of the world economy. The literature on East Asia’s decoupling can be traced back to the late 1980s and the early 1990s, when the one of the main questions of IPE was whether the proliferation of RTAs and other regional institutions would weaken

globalization, and multilateralism (Bhagwati, 1992)—or in other words, would we be witnessing the emergence of a ‘world of regions,’ where regional integration takes precedent over integration into the global economy (Katzenstein, 2005). The more explicit question of East Asian decoupling attracted increased interest from pundits and scholars after the 2008–2009 Global Financial Crisis and was based on the perception that the relative importance of the US and the European market in the world economy would undergo a rapid decline in the 2010s (Wu, 2010).

The decoupling thesis has taken a very different form from 2018 onwards. In its current iteration, decoupling is mostly associated with the political contestation of interdependence as characterized in the introduction of the dissertation. Simply put, the narrative is that due to their strategic rivalry, both the US and China aims to lessen its economic dependence on the other actor and thwart the economic clout of their rival in the international arena. Moreover, the post-2018 events gave renewed steam for East Asian decoupling narrative based on the apparent retrenchment of the US from regional and global economic institutions after the election of Donald Trump. In this setting, the argument goes, East Asia is bound to be bound to the Chinese economy in the long term (Wei, 2019).

Empirically evaluating these claims is problematic for a number of reasons. First, the post-2018 effects would be hardly measurable in 2021, as according to the economics literature on FTAs and international trade, trade policy changes take close to a decade to lead to statistically observable effects. Second, the COVID-19 pandemic has upended global trade from 2020 onwards, making it nearly impossible to separate the effects of the pandemic from that of US (or Chinese) trade and economic policies in recent years.

Third, data availability represents a challenge. Measuring value-added transmitted through GVCs could provide a detailed picture of decoupling, but in this regard, coverage is limited. While the ADB MRIO is available for the years 2019 and 2020, it does not cover years earlier than 2007, apart from the single year of 2000. The OECD TiVa database covers years from 1995 to 2018 but is not available for the most recent years, meaning that the effects of the Trump trade war are unobservable regardless of how long it would take for such measures to show up in aggregate value-added data. The EORA and WIOD database do not cover years beyond 2015. Hence if one is to use a single database for the sake of data integrity, there is a choice to be made between longevity and actuality.

For these reasons, just as in the case of the measurements related to the effects of political discord, the trade war will not be measured in this configuration either.

6.3.1 Decoupling on a value-added basis

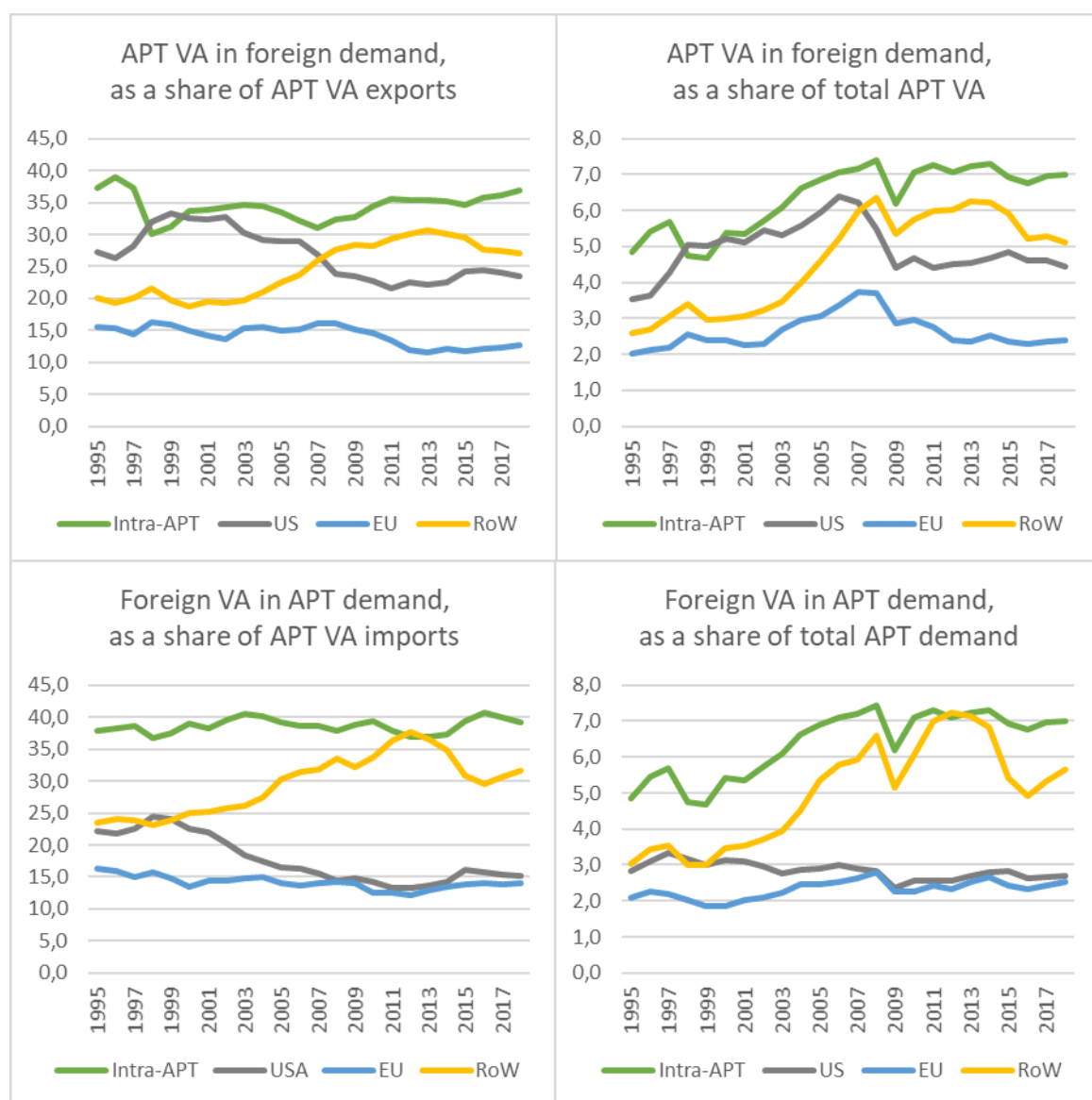
As noted in Section 2.5, gross intra-regional trade share has been stagnant in East Asia for a decade. While the foreign markets of East Asian economies have been undergoing a process of diversification with the decline of EU's and US' share, and the rise in the share of the rest of the world, this process is driven in part by the higher growth rates in non-APT emerging markets, and in itself does not validate the decoupling narrative inasmuch as the latter assumes that East Asia is becoming a more closed and self-sustaining economic unit.

Nevertheless, to better evaluate the decoupling narrative, I analyse the trends of value-added transmitted through intra-APT and extra-APT trade based on the OECD TiVa database to examine if there is a reorganization of consumption and dependence patterns based not on gross but on value-added data.

I examine value-added data from two times two perspectives. The first pair of figures surveys value-added exported by the APT countries based on where it is consumed in final demand. I calculate the data from two perspectives: value-added consumed by partners as a share of the total value-added exported by the APT economies and value-added consumed by partners as the share of the total (both exported and domestically consumed) value-added by the APT economies. The first of these measures shows how important a certain market is in APT exports. The second measure shows how important a certain market is from the perspective of the whole economy. This distinction is warranted by the fact that the share of exported value-added in total value-added has been rising in the APT, meaning that exporting is becoming relatively more important for economic activity and welfare in general. Consequently, if the relative importance of exports to total economic activity rises, even a stagnating trade share with a trade partner means that said trade partner is becoming a more important market from the perspective of the domestic economy.

Second, I examine the share of imported value-added in APT economies from the same two perspectives, namely as a share of imported value-added, and as a share of total domestic demand.

Figure 29. Value-added embedded in exports and imports in final demand.



Source: Calculations based on the OECD TiVa database.

As the data shows, there is scant evidence for decoupling since the 2008–2009 Global Financial Crisis. The intra-regional share in the exported value-added of APT economies has been stagnating for a decade, meaning that the relative importance of the intra-regional market has not changed substantially. The same is the case in the import side. The economic importance of trade in general has grown rapidly in the region between the millennium and the crisis, which is due in large part to China’s WTO accession. However, in value-added terms, the intra-regional share in imports in final demand has remained flat, while the export side shows only a marginal increase. Moreover, during the period of ‘slowbalization’ and China’s declining reliance on trade and increasing reliance on domestic investment for growth, the share of trade value-added

compared to domestically used value-added has declined a few percentage points from its peak.

Nevertheless, value-added data also shows that the importance of the US and the EU is on a long-term decline, although the pace and severity of the decline varies by perspective. In that sense, if decoupling is defined as the relative decline of ‘Western’ economies for East Asian producers and consumers, then there is some evidence for such a process. On the other hand, if decoupling is defined as a general loosening of economic ties vis-à-vis the rest of the world, and especially vis-à-vis ‘Western’ economies, then the notion is not supported by the data.

6.3.2 Financial decoupling

The direct investment trends in East Asia have been discussed in detail in section 4.3, but it is nevertheless worthwhile to take a look at the numbers once again from the perspective of the decoupling narrative. As Table 24 shows, the share of intra-regional direct investment remained steady between 2009 and 2020, hence decoupling cannot be identified in international capital movements.

On the other hand, the data also shows that the direction of investment is changing at a rather rapid pace: while traditionally the EU, and the US were the main sources of direct investment in the region, their share has been eroding in recent years, while the share of the rest of the world, that is, countries outside of the APT, the EU, and the US, has been expanding. In this sense, direct investment data suggests that the APT has been becoming more globalized in its financial relationships, and its external financial dependence has been undergoing a process of diversification. In all likelihood this is closely connected to the fact that the APT is the most dynamic region of the global economy presently, which presents attractive business opportunities for investors from other emerging markets.

On the other hand, the pattern of diversification is not present in outward investment, where the shares of extra-regional partners have not changed substantially since 2009, and indeed the EU’s share have grown somewhat. This is a reflection of the fact that in spite of the political and media attention the BRI has garnered in recent years, the largest share of Chinese outward FDI activity is concentrated in Western Europe, where acquisition of technology and strategic assets is less challenging for Chinese

investors than in the US, even in the face of the strengthening of the EU's investment screening regime.

While section 4.3 examined direct investment as a proxy of power in influencing the production structure, from the perspective of decoupling, portfolio and equity investment statistics are also relevant.

Table 30. Portfolio equity investment shares vis-a-vis the APT.

Inward	2002	2004	2007	2010	2013	2016	2019
Intra-APT	7,0	8,3	15,2	15,8	15,4	18,0	19,1
North America	51,4	48,2	44,9	46,9	45,7	44,7	44,1
EU	35,5	37,7	33,6	30,8	30,2	25,8	23,5
Rest of the World	6,2	5,8	6,3	6,6	8,7	11,5	13,3
Outward							
Intra-APT	9,9	13,1	24,5	20,3	20,2	17,1	17,2
North America	36,8	33,7	23,0	25,1	28,1	25,1	24,9
EU	27,9	27,7	22,7	17,2	17,2	14,9	14,5
Rest of the World	25,4	25,5	29,8	37,3	34,4	42,9	43,5

Sources: ADBi, IMF.

Table 31. Portfolio debt investment shares vis-a-vis the APT.

Inward	2001	2004	2007	2010	2013	2016	2019
Intra-APT	17,0	15,1	19,2	22,0	30,2	26,2	26,1
North America	14,2	15,4	13,5	13,2	13,7	16,8	17,6
EU	35,8	41,6	42,3	34,6	31,2	30,3	24,7
Rest of the World	33,0	27,9	24,9	30,2	24,9	26,6	31,6
Outward							
Intra-APT	4,0	3,2	5,4	6,2	11,4	10,7	12,2
North America	34,8	32,3	30,2	31,6	30,1	42,8	39,4
EU	38,4	38,1	37,1	31,9	29,9	24,7	24,2
Rest of the World	22,8	26,5	27,4	30,3	28,6	21,8	24,2

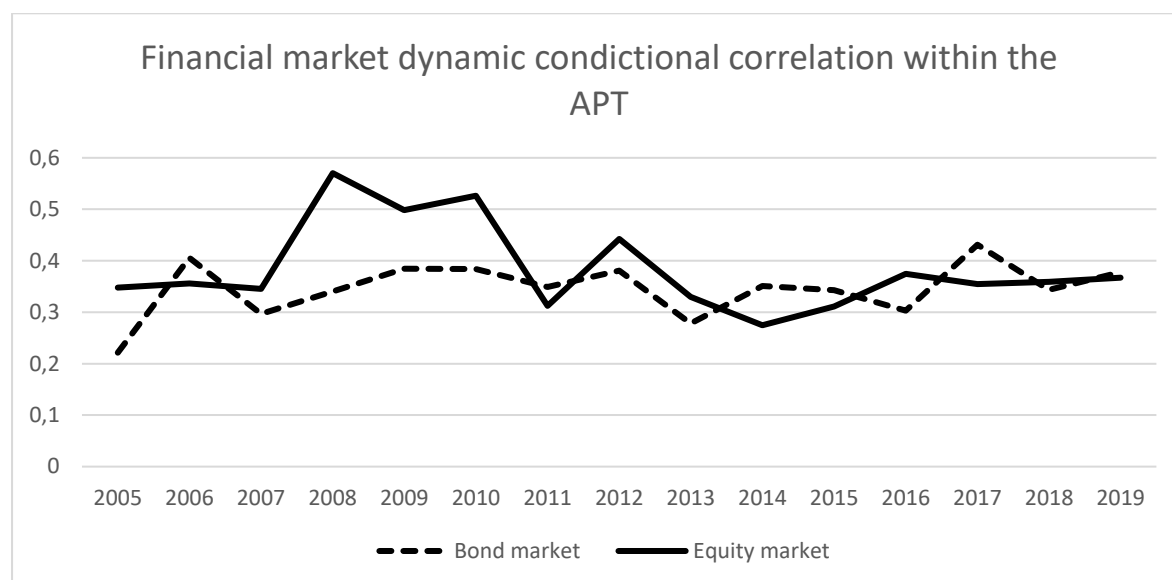
Sources: ADBi, IMF.

As the previous tables show, there are both signs of decoupling and heavy extra-regional financial dependence in the data. The intra-regional share of portfolio investment has grown markedly between 2010 and the mid-2010s in all directions and both categories. However, the intra-regional shares have remained stagnant in the last half a decade, and are lower than in direct investment apart from inward portfolio debt investment shares, where the intra-APT share is almost identical to the FDI share.

Furthermore, the data underscores the reach of the US financial system. US entities remain by far the top equity investors in the APT, while the US is also the prime market for outward portfolio debt investment. The EU's share, on the other hand, shows a steady decline in East Asian financial ties.

A final metric to be examined concerns financial market interdependence in East Asia, based on the dynamic conditional correlation model developed by Hinojales & Park (2010). The correlation values, which show if market movements in Asian equity and bond markets are synchronized, show a stagnant dynamic.

Figure 30. Financial market correlation in the APT.



Source: ADBi integration indicators database.

Notably, the correlation in East Asian equities markets were very high in the years of the 2008–2009 Global Financial Crisis but eased again in the 2010s. Bond market correlation has remained flat for the whole period between 2005 and 2019, when data was available. While financial market interdependence is much higher than interdependence measures through investment shares, the decoupling dynamic is not apparent in the data.

In summary, based on currently available trade, value-added, and financial data, there is scant evidence for a deep shift in East Asia’s economic relationships with the rest of the world. Intra-regional economic ties have certainly been intensifying, and the regions external relations have been showing signs of rapid diversification from a heavy reliance on the US, and the EU to a more pronounced trading and financial relationship with other regions of the world. However, this is more of a case of East Asia being heavily embedded into global economic networks, which is contrary to the notion of decoupling.

6.4 Regional order, and institutional strategies

6.4.1 Contestation, and distribution

The recent debate on the relative decline of the US, China's rise, hegemony and power transition, East Asian regional order, and the politics of regional institutions have produced a deeply heterogeneous literature, which would be beyond the scope of this section to tackle in depth. For this reason, I limit the discussion of regional politics to the narrower theme of this dissertation, namely the institutional order underpinning regional commerce, and consequently, regional welfare.

As Goh (2019) noted, the contemporary contestation of the East Asian regional order is a multi-layered process, where different areas of international social interaction produce different behaviour from the US as the status quo hegemon, China as the challenger, and ASEAN, Japan, and other 'subregional powers.' In this conceptualization, the security domain is dominated by complicity with the US, the economic domain is characterized by the diffusion and fragmentation of state power, while the institutional domain is where China's contestation, and consequently the accommodation/balancing behaviour by regional states, is most vividly displayed.

In the closing pages, I will briefly survey this contestation from two perspectives. As described in the previous Chapter 2 and 3, East Asian regionalism advanced from a process driven by complementary domestic and international institutional and market forces in a favourable international environment created by corresponding national interests, to one characterised by increasingly complex and competitive international institutions, national interests, and identities. Moreover, institutional quality was found to be a key determinant of the smooth functioning of the production networks which are the prime vehicles of East Asian development, and thus is also a key determinant of international integration as a whole.

These two findings have important implications on the institutional strategies of regional states, and the precise institutional design they pursue. In this regard, the difference between the Chinese, ASEAN, and Japanese approach should be highlighted. China's recent institutional strategies prioritise physical network-building through international infrastructural investment, but on the other hand, neglect the importance, or, according to critics, in many cases even worsen the prospect of domestic institutional upgrading as vehicle of deeper integration. The ASEAN's approach, on the other hand, encourages flexible and often informal ways of what I would call integration-facilitation,

instead of strict commitment vehicles. As such, ASEAN embraces the institutional heterogeneity which persists among members of the group. In contrast, Japan's recent institutional strategies emphasise deeper institutional aspects and require deeper commitments, even if the willingness to commit is problematic in some cases due to the nature of the domestic political economy. Moreover, the conclusion of the RCEP and the CPTPP have profound implications for the regional status quo by promoting deepening, albeit somewhat different models of integration.

A related, salient problem concerns the handling of distributional dilemmas. As discussed with regards to the flying geese theorem, a key feature of East Asian regionalisation has been its complementarity: nations of varying stages of development could take part in the regional division of labour, and then develop in parallel with each other. This is the main reason why the usual distributional dilemmas could be avoided in East Asia, and the region could develop broad regional business networks without centralised international regulation. Hence, the maintenance of complementarity is of paramount importance for the sustainability of this current form of regionalisation; while a decreasing degree of complementarity would make stronger institutional regulation necessary.

There are a number of contemporary signs that this benign complementarity is on the decline: China is actively attempting to mount a technological challenge to the leaders in the region, namely Japan and South Korea, while at the same time remains heavily competitive in mid-level technology and even lower-level assembly activities, where it poses competition for middle-income and low-income countries in the region. On the other hand, the rise of Chinese wages and the relatively recent entry into East Asian regionalisation by low-income countries such as Myanmar, Laos, and Cambodia means that some of the manufacturing activity within regional production networks is leaving China and penetrating new countries, suggesting that the structural forces of complementarity are still at work.

6.4.2 China, institutions, and distribution

The Asian financial crisis was the watershed moment in China's East Asia policy: afterwards, China started to focus on its East Asian neighbours, and engaged regional institutions in a more active manner to further its interests (Wu, 2009). China has been most active in the area of economic arrangements. Apart from the CAFTA, it proposed a

Northeast Asian FTA and an East Asian FTA in 2002 and went on to conclude bilateral economic agreements with 18 economies, including Thailand, Singapore, Taiwan, New Zealand, and Australia.

There are two distinct characteristics of the Chinese approach of the first decade of dealmaking. First, China followed a multi-track approach, as it pursues both bilateral and multilateral frameworks simultaneously. Second, it started from a low starting point to resolve ‘easy’ issues quickly, and offers concessions for political goals, before moving towards deeper initiatives (Wang J. , 2011). After the Global Financial Crisis, and particularly after Xi Jinping assumed the leadership roles of the CCP, the Chinese military, and the Chinese state, China has become even more active and strategic in its institutional approach and began to establish new institutions within and beyond the East Asian region.

China partnered with other emerging economies, including Russia, Brazil, and India to establish the New Development Bank in 2014 as an apparent rival to the US-led World Bank. In 2013, Xi Jinping announced the New Silk Road, later renamed One Belt, One Road, and finally Belt and Road Initiative, which became the primary vehicle for Chinese foreign investment and lending since then. China also established the AIIB in 2016, which was conceptualized by the US at the time as a challenger to the ADB, although its membership later swelled to 104 countries, including many Western European allies of the US. In addition, as noted above, China was part of the effort to push the RCEP over the line⁷² and applied for CPTPP membership as well. In essence, China has been entering every possible institutional sphere in the region, and beyond.

In part, these initiatives reflect Chinese economic interests. The BRI serves as a gateway for Chinese capital and Chinese firms in previously unpenetrated foreign markets, ensures Chinese access to vital minerals and raw materials in Africa, South America, and the Middle East and plays an important role in outsourcing the excess capacity built up in China’s heavy industrial and construction sector during the investment boom of the early 2000s. More generally, as China remains at the center of GVCs, and consequently heavily reliant on foreign trade for its prosperity, it is in its interest to cultivate trading relationships and ensure the stability of the trading environment for Chinese companies. In this sense, China’s challenge to US leadership

⁷² However, China did not play a leadership role in the RCEP, which was an ASEAN-led initiative (Solís & Urata, 2018, p. 118).

and the current international order is only partial: as it accepts some of the fundamental norms of global capitalism, it is a ‘revisionist stakeholder’ (Zhao, 2018) or a ‘reformist revisionist’ state (Buzan, 2010), which accepts parts of the norms underpinning the current order, while rejects others.

While the AIIB and especially the BRI has been often described by the US as a ‘debt-trap’ and a vehicle of Chinese influence instead of the purported ‘win-win’ economic cooperation, empirical investigations did not find evidence for this in either case (Jones & Hameiri, 2020; Wilson, 2019). To the contrary, a positive relationship between Chinese foreign financing and economic growth has been demonstrated (Mueller, 2021). Additionally, there is also evidence that grievances in emerging and developing economies about global financial instability, such as volatile portfolio flows or heavy-handed IMF programs, raise support for Chinese leadership (Broz, Zhang, & Wang, 2020), showing that China profits from the systemic weaknesses of the US-led financial order politically.

On the other hand, it is evident that the Chinese approach lacks focus when it comes to creating rules, and norms while it regularly exploits its economic power in order to achieve superficial political gains. As for the former point, while in terms of financing, the BRI is one of the premier vehicles of international investment presently, it is not an institution with a well-defined set of aims, organizing principles, and a clear strategy on achieving ‘win-win’ cooperation. It has been well documented that Chinese foreign economic policy in general, and the BRI in particular, suffers from a proliferation of self-interested sub-state actors, may those be local Chinese governments, Chinese SOEs, financial institution, or private firms aiming to profit from the windfall. This results in the lack of coordination and the deviation from the central priorities (Jaros & Tan, 2020; Jie & Ridout, 2021).

As for the latter point, China’s recent use of de facto trade restrictions against the Philippines, and Australia show that the Chinese government uses trade and interdependence as a strategic asset and is willing to weaponize interdependence against weaker states—even FTA partners—in political conflicts. More generally, economic reliance on China is positively correlated with a more China-friendly foreign policy (Kleinman, Liu, & Redding, 2020), suggesting that dependence leads to an adjustment pressure towards Chinese preferences. In this sense, institutionalization provides a low-cost option for China to promote its political and economic interests and undermine

certain elements of the existing international order, such as the US preponderance in the World Bank, and the IMF.

There is a similar tension between China's purported support for multilateralism and its behaviour in international disputes. In general, China has been pursuing a strategy which centres on delaying the resolution of the disputes, as Beijing strives to consolidate its claims vis-à-vis weaker states (Fravel, 2011, p. 292). Beijing insists on 'solving' these disputes bilaterally instead of within multilateral institutions or frameworks, and also rejects international arbitration (Xinhua, 2014). In one formulation, this is a reflection of the fact that China "has essentially learned to employ liberal institutional and social constructivist means for realist purposes" (Li M. , 2010, p. 123).

In summary, China's institution-building does not lead to the creation of common rules, and norms in East Asia, and as such, its potential to act as a stabilizing force and regional leader with the retreat of the US from free trade and economic institutionalization is limited. Or in the words of Shambaugh (2013, p. 153), China can be described as a 'partial power', which "knows what it is against but not necessarily what it is for".

This characterization is also supported by the fact that China's leadership potential is constrained by the limits to its material capabilities. As Chapter 4 shows, China's gravitational pull in the economic realm has certainly elevated it to a key player in region, but it is far from preponderant relative to the US. Moreover, China is at the lower end of international value chains and is heavily reliant on, and vulnerable to, foreign inputs, technology transfers and access to overseas markets, which constrains its structural power and its capacity to exercise control over regional production, trade and investment. In addition, while China's centrality and market power has undoubtedly grown rapidly over the past decade, its engagement with the global economy is characterized by a deeper extra-regional involvement, as evidenced by the direction of Chinese financial flows. This means that Chinese capabilities are put to use in a global context, not solely a regional one.

The nature of China's involvement in international production should also be noted. China is moving toward forward participation in GVCs, whereas a large market would be expected to specialize downstream. This is relevant for the political economy of the region, for first, China would need to increasingly specialize downstream to support its development, and second, to be able to act as a regional leader, it would need to absorb more value-added from GVCs, whereas in this setting China's absorption of

foreign value-added relative to its domestic supply for foreign production is on the decline. This process is in line with the prediction of Gereffi (2014), who argued that further concentration in big manufacturing hubs such as China is the next stage in what he termed as “post-Washington consensus” GVC development. While such concentration might look like the manifestation of Chinese power on the face of it, it nevertheless threatens to reduce the opportunities of other regional states for economic upgrading, and thus would harm China’s potential for political leadership.

This is also apparent in domestic policy. In light of the trade tensions *vis-à-vis* the United States and the threats posed by structural imbalances in the Chinese economy resulting from decades of export-oriented growth, the Chinese leadership has declared in May 2020 that it will follow a so-called ‘dual circulation’ economic strategy. This policy distinguishes between the “international circulation” centered around processing trade, and the domestic circulation, or in other words, domestic consumption-led economic growth (Kwan, 2021). This points to a strategy which is less reliant on international trade, which on the one hand might enhance China’s leadership potential with the creation of higher domestic demand and thus increasing imports. On the other hand, such promises have been repeated by the Chinese leadership since at least 2007, yet the share of final consumption in the Chinese GDP have remained among the smallest in the world, and even after a decade of expansion since 2010, have only reached 56 percent by 2019, contrasted to over 70 percent in most advanced economies and 81 percent in the US. The main paradox of Chinese power is that China will become the largest economy in the world while still being a developing country. Consequently, its interests will remain largely domestically oriented and related to its own development, as well as constrained by its external reliance. The slowdown in Chinese growth rates during the 2010s, and the Chinese state’s regulatory crackdown on numerous economic sectors ranging from online tutoring to financial technology, and mobile game development, shows that behind the increasing global clout lie serious domestic weaknesses.

In this sense, the inherent dilemma of regional economic relations has not changed with the rise of China. China is not acting as a hegemon stabilizer in the sense of absorbing the demand of regional countries, but rather the whole regional architecture is reliant on foreign demand to sustain itself. This is not to say that China’s influence will not continue to grow, and that China soon will not become a dominant power in East Asia and beyond. However, based on current data, this will take many years to manifest.

6.4.3 ASEAN: The AEC and beyond

In this increasingly competitive regional environment, of which great power rivalry is becoming a defining feature, the ASEAN—in line with the very interests it was founded to protect—strives to maintain its central position in East Asian regionalism. The ASEAN cultivated its ‘centrality’ by successfully positioning itself as the main forum for bargaining over regional order (Goh, 2018). Nevertheless, this strategy appears to show some recent crack partly due to the intensification of US–China frictions which the ASEAN lacks the power to influence, and partly due to the apparent lack of unity among its members in terms of both leadership preferences and material interests.

The internal differences in interests and the external threats to unity are supposed to be mitigated by the AEC, which serve political goals through economic means. Based on the AEC Blueprint, the ASEAN is preoccupied with ‘strengthening its resilience’ and crafting a ‘single market and production base of competitive economies.’ What the ASEAN is aiming for is, first, to lure in foreign investment by creating a large enough market for goods and services; second, to provide a breeding ground for ASEAN companies and enhance their competitiveness; and third, to deflect trade and investment towards the ASEAN. Importantly, the AEC was mostly motivated by external factors: Asian Financial Crisis, the burgeoning of FTAs and PTAs in East Asia and globally, the rise of China and India as competitors for investment, and the ASEAN’s aim to remain at the centre of gravity in East Asian and Asia-Pacific integration have all played a pivotal role in forcing the ASEAN to act (Chirathivat, 2008).

However, the AEC presents an unorthodox, if indeed ambitious, plan for economic integration. First, it created a ‘single market,’ which is akin to a step between a common market (as it involves the liberalisation of factor movements) and an economic union (as it aims for a substantial degree of harmonisation among member states), but it did not create a customs union in the process. Second, the ASEAN is trying to reach its aims the ‘ASEAN Way:’ instead of setting up supranational bodies and legally binding institutional frameworks for regional economic management, it created a soft, consensus-driven framework with an intergovernmental dispute settlement mechanism and vague obligations.⁷³ Third, as the main sources of growth in the ASEAN are trade and inward FDI, the ASEAN is reliant on, and vulnerable to, outside forces in maintaining its

⁷³ Apart from tariff reduction and elimination, and to a lesser extent sectoral liberalisation, for which clear deadlines are present, the AEC Blueprint largely lacks numerical targets and benchmarks for much of its policy goals.

economic prosperity. Most of the investment comes from outside the ASEAN; most of ASEAN trade are with outside countries; most products manufactured inside the ASEAN are made by foreign firms; and the markets for these products are mostly outside the ASEAN. Additionally, most of the ASEAN's main trade and investment partners are larger, and/or more developed economies. Fourth, the highly diverse nature of ASEAN economies poses a challenge to economic integration. The developmental divide within the ASEAN, the divergence in political systems, economic policies, and material interests of the member economies might prevent the ASEAN from reaching its aim of remaining in the 'driver's seat' of East Asian integration.

As a result of this diversity and divergence, the AEC faces both a commitment and a distributional dilemma. The former was evident in the slow, imperfect and dispute-ridden implementation of the AFTA. Simply put, member states try to defect from market liberalisation to protect their industrial sectors.⁷⁴ The commitment problems have also surfaced in the political domain over the past years with debates regarding the political status of Myanmar and Thailand, where the military seized power from the civil leadership, presenting a challenge to the ASEAN as a whole.

The latter problem became evident during the standard harmonisation process and in the problems generated by the developmental gap between the ASEAN-6 and the CLMV countries after the enlargement of the organisation. In the first case, the lack of 'focal point' (i.e., leadership) produced problems. In the second aspect, the least developed member states have to bear substantially higher costs in the integration process due to their lesser competitiveness and higher tariff levels (Yoshimatsu, 2008, pp. 30–42). Similarly, services trade liberalization, and the elimination of non-tariff barriers became issues for the AEC process, as less developed and less politically open member states were unwilling to commit to deeper reforms in this regard (Ishikawa, 2021).

From this perspective, ASEAN economies are generally not complimentary, and although this might be beneficial from the viewpoint of economic efficiency, the increased competition resulting from market liberalisation carries high costs, especially for the CLMV. This problem is further complicated by the fact that the ASEAN lacks the capacity to compensate for these negative effects, which is closely tied to its lack of leadership. Although from time to time, one or another member state—most notably

⁷⁴ Disputes involved the automotive industry of Malaysia and the reluctance to eliminate tariffs on petrochemical products by the Philippines.

Singapore and Thailand—has played an instrumental role in agenda setting and coordination in the ASEAN, none of them possesses the capacity to be a driver of integration.

The problem for the ASEAN is twofold in this regard. First, its richest members—Singapore and Brunei—are the smallest ones, and its least developed members have the largest populations. Consequently, ASEAN has no capacity to offer substantial technical and financial assistance to its least developed members to ease the costs of market liberalisation.⁷⁵ Second, the very nature of the ASEAN Way presupposes an opposition to leadership, inasmuch as it stresses consensus and is of an anti-hegemonic character (Acharya, 2009). Incidentally, the one country which might have the potential to aspire for ASEAN leadership, Indonesia, is also the one with the most anti-hegemonic foreign policy.

The loose integration style of ASEAN increases the importance of collective action problems, because the member states can defect easily from cooperative commitments for the purpose of short-term gains. The ASEAN's decisions are more akin to 'guidelines' than strict rules. Implementation is left to member states, and perhaps the greatest deficiency of the ASEAN's institutional setup is the weakness of enforcement, given the lack of a supranational body to supervise implementation and enforce compliance with ASEAN directives. Dispute settlement is provided for but is more of an intergovernmental–political process than a legal–judicial one, thus is less effective and less strict. This is not to say that the ASEAN is a failure or that its form of regionalism did not prove to be durable and successful. But from the perspective of regional leadership, the very design of the ASEAN presents fundamental challenges to it playing a leading role in the future.

Additionally, external forces and the very nature of the AEC have the potential to deepen these commitment problems. ASEAN economies are deeply engaged with, and tied to external actors—China, Japan, the US, and the global economy as a whole. As dissected in Chapter 4, while the intra-APT investment share is fairly substantial, and the intra-APT trade share is high in international comparison, the intra-ASEAN values are

⁷⁵ Although equitable development plays a central role in the AEC Blueprint, and the ASEAN is trying to accommodate the potential harms to the CLMV countries partly by exploring avenues—such as the IAI or the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy—for some sort of limited assistance, partly by allowing said countries a number of extra years to comply with tariff reduction goals, these initiatives can offer only very limited, and far from sufficient, assistance to the needy members. Most of the development projects in the CLMV countries as financed by China and Japan, or institutions such as the ADB.

much more modest, suggesting that member states are more integrated with the ‘Plus Three’ economies than with the rest of the ASEAN. Indeed, recent data shows that the ASEAN is losing its centrality in GVCs in the region due to competition for FDI from other emerging economies (Fujita M. , 2021).

For this to be bridged, the AEC has to deliver substantial benefits to its members for them to remain committed to it and refrain from defection. In this sense, broader integrating mechanisms, such as the RCEP are a double-edged sword for ASEAN: the RCEP is a testament to the fact that the ASEAN remains the focal point of institutional arrangement within the region, it also shows that the economic substance of regionalism lies beyond the ASEAN’s borders.

In this regard, some positives can be drawn from the perspective of ASEAN from recent data, which shows that the ASEAN’s export space is expanding faster than the world average, meaning that integration is proceeding at a decent pace, even despite the abovementioned fragility of the ASEAN Way from an economics perspective. On the other hand, “the de facto relative importance of intra-regional trade, investment, and/or migration flows are close to the global average level,” which suggests that integration within ASEAN is not deeper than in several other regions (Chen, De Lombaerde, & Cuyvers, 2017). Nevertheless, Shimizu (2021) suggests that the damage resulting from the trade war and the COVID-19 pandemic would bring fresh impetus to the AEC, since as noted in earlier chapters, crisis was generally a catalyst for further integration in the history of ASEAN.

However, the lure of these external forces might provide further incentives for defection. First, the more developed ASEAN countries are likely to have a strong incentive to pursue a faster liberalisation agenda, thus undermining ASEAN-centrality. This has already happened to some extent in the case of bilateral treaties by the middle- and high-income ASEAN members, and the partial entry of ASEAN members into the CPTPP, which goes against the notion of ASEAN unity. Second, less developed members wary of the potential costs of fast liberalisation might turn to outside forces as well. China is especially important in this regard, as three out of the four CLMV countries already have strong—and asymmetrical—ties with it. As detailed in Chapter 4, Cambodia, and Laos show by far the highest level of dependence on China in the region, much higher than any other regional state. These states are also the friendliest towards China in the ASEAN, and routinely dilute the groups’ common approach towards Beijing.

More broadly, the ASEAN is challenged by a ‘great power bargain deficit’ when it comes to keeping its centrality. The ASEAN’s strategy has been to keep great powers—China, and the US—at arm’s length and ensure that the ASEAN remained the main negotiating forum for the region. However, US–China competition reached a point where a negotiated status quo would entail one great power accepting a reduced role in the region, which the ASEAN does not have the bargaining power to facilitate (Goh, 2018).

6.4.4 Institutional balancing

The great power bargain deficit is apparent not only for the ASEAN but for Japan and lesser regional powers such as South Korea, and Australia as well. The Japanese policy towards global and regional institutionalization has traditionally focused on creating clear and stable rules, and norms governing interstate and transnational relations (Watanabe, 2020). This approach, however, has been severely challenged by the US–China confrontation, China’s increasingly assertive foreign policy, and the US disengagement from institutionalization (Masujima, 2021).

In this sense, the recent Japanese strategy has been often described as institutional hedging, or institutional balancing *vis-à-vis* China in East Asia, which refers to the notion that Japan is striving to promote its values and interests in rules-based multilateral institutions so as to limit China’s scope for assertiveness. In one version of this narrative, the exclusion–inclusion dynamics of regional institutions is beholden to geopolitical motives instead of functional ones. This narrative states that Japan and China are vying for influence over ASEAN, within RCEP, and by the creation of rival international institutions, such as the AIIB, and the BRI, while the ASEAN itself is trying to project its own vision by emphasising the principle of ASEAN Centrality in East Asian integration (Lee S. , 2016). A widely discussed issue is bargaining over membership inclusion in regional institutions, such as Japan promoting the expansion of the APT to the East Asia Summit to include like-minded countries in Australia, New Zealand, and India and thereby reducing China’s relative influence in the ASEAN framework. Similarly, the original conception of the TPP or the US and Japanese refusal to join AIIB are held up as examples of this dynamic (He K. , 2018, pp. 95–96). Another example is the concept of the Indo-Pacific, and the ‘Free and Open Indo-Pacific,’ which is an attempt to dilute China’s influence by widening the concept of the region and including India as a further counterweight to China.

It has also been suggested that the CPTPP “helps Japan position itself vis-à-vis the other great trading powers in the region: it prevents China from becoming the single focal point of integration and preserves an economic rulebook that helps deter Chinese mercantilist practices;” while simultaneously “discourages a US inward turn by raising the costs of American marginalization” (Solís & Urata, 2018, p. 117). Another concept of mega-FTAs such as the CPTPP and RCEP proposes that instead of balancing, these initiatives serve as commitment vehicles to lock in economic gains, and as such “may support a coalition of trade-friendly middle power countries that want to defend rule-based trade” or “may also provide a bridge across superpowers, rather than setting a wall between them” (Kimura, 2021, pp. 86–87). Another bridge which has been laid by Japan recently was the EU–Japan FTA, which entered into force on February 1, 2019. CPTPP and the EU–Japan FTA thus suggest that Japan is hedging its economic fortunes among the US–China rivalry on diversification and the plurilateral advancement on rules and norms favourable to its exporters and investors. In light of the analysis in Chapter 3 which suggested that domestic institutional quality is a key determinant of regional trade and welfare, such a strategy appear to be beneficial from the perspective of regional integration.

Still another formulation of the institutional balancing thesis posits that the main variable driving state behaviour with regards to institutionalization under a conditions of an order transition is ‘role conception.’ Operationalizing this concept for the present means that even though Japan, South Korea, and Australia do not have the capabilities to play a leadership role in a reforming order, they can vie to be ‘kingmakers,’ and in order to achieve this position, they tried to develop new, rival institutions, which have failed so far to gain any sort of relevance (He K. , 2018).

The inclusion-exclusion dynamics are nevertheless challenged by China’s application to join the CPTPP. On the one hand, from a liberal perspective this presents an opportunity to tie the great powers’ hands and limit its potential assertiveness by subjecting it to the strict rules of a high-level trade agreement. Moreover, an optimistic reading of the situation would suggest that China’s accession into the CPTPP would lead to a deeper wave of reform and liberalization in the Chinese economy in order for China to be able to satisfy the CPTPP requirements regarding fair competition, SOEs, government procurement, services liberalization, and environmental and labour regulations. A realist reading of the situation would however anticipate that due to China’s predominant position in economic power *vis-à-vis* other participants, the

incompatibility of its domestic political and economic system with many of the CPTPP's rules and values, the persistent frictions regarding China's compliance with WTO commitments, and its tendency to use economic coercion as a political bargaining tool, letting China accede the CPTPP would be a self-defeating move for the remaining eleven members (and many more aspirants) of the agreement.

This ambivalence is also a reflection of the situation in the security domain, where balancing and hedging strategies are much more pronounced against China by regional states, such as Australia, Japan, and Vietnam (Koga, 2018). This ambivalence between the economic and the security architecture, as well as the intensifying US–China competition led to a pattern where regional states are increasingly reliant on the US defence guarantees to balance the security risks posed by a rising China, whereas increasingly reliant on the economic opportunities provided by the growing Chinese economy. However, as noted many times in this dissertation, the networked nature of interdependence and the ongoing diversification of East Asia's economic ties might lower these tensions to a degree.

In summary, with regards to the sub-research question, the regional architecture proved to be resistant in the face of the challenges posed by the 'strategic competition,' but the sustainability of the current architecture is slightly eroded by longer term political and economic processes.

7 Conclusion

In this dissertation, I examined how the conditions of contemporary production network-based interdependence augment international politics in East Asia. Within this broad research agenda, three sub-research questions were investigated.

The first of these questions concerned the determinants of regional trade and production network participation in East Asia. Chapter 3 analysed this issue and discussed how states can influence these determinants. As the contestation of regional order through institutional and economic means is a central theme in contemporary IR and IPE literature, it is necessary to have a grasp of how exactly the regional order can be influenced. I proposed that one overlooked factor in previous research was the role of domestic institutions, the features and changes of which have international influence in a world economy dominated by transnational production networks. The gravity model estimations confirmed this view, and also showed that FDI, WTO participation, and regional FTAs remain important determinants of economic interdependence as well.

The second question of the study concerned the measurement of economic influence in economic networks in East Asia. In Chapter 4, I investigated this question by invoking theoretical aspects from Hegemonic Stability Theory, the weaponized interdependence research program, and recent advances in the study of the economics of GVCs. I have analysed intra-regional and extra-regional economic ties from four perspectives: centrality and hubness in regional trade and production networks, technological sophistication and technological reliance, input and market dependence based on value-added transmission in production networks, and financial influence. Based on the data accumulated and investigated, I have posited that while China's economic influence is expanding at a strong pace in East Asia, the US remains the main market of regional production, and in terms of financial power, China lags behind other centres of power. The novelty of the chapter is the utilization of input-output data and value-added calculations for the measurement of interdependence, which has been lacking from the IR and IPE discourse, despite the prevalence and importance of GVCs in the contemporary world economy.

In Chapter 5, I presented two short case studies in order to outline some strengths and weaknesses of the weaponized interdependence research program. I first looked at the US–China ‘trade war’ which started in 2018 and dissected why the US was not able to achieve its strategic aims through its market power. Second, I evaluated how the US

was able to utilize its control over production chokepoints in the semiconductor ‘trade war’ it has initiated against a small group of Chinese technology companies, but also argued that this ‘victory’ was limited, for the domestic political economy, economic logic, and the globalized nature of the sector meant that the costs for a more widespread suffocation of the Chinese semiconductor industry would have been far too high for the US. The analysis presented a new angle relatively unexplored in the previous literature about the domestic trade-offs and structural limits imposed on the aggressor in the event of a weaponization of chokepoint technologies.

In the final chapter, I examined my third sub-research question, which asked how the current conditions of US–China competition affect the sustainability of the regional economic order. First, I have analysed through a gravity model if East Asian economic relations are reacting to political discord, and found meagre support for this, albeit with the caveat that the events of the trade war are too recent to be statistically significant in such a model. Second, I investigated whether East Asia is decoupling from the US or the rest of the world economy through financial and value-added data and found that there is a notable diversification in East Asian extra-regional economic ties, but decoupling can not be identified in the sense that East Asia is not turning away from globalization. These sections contributed to the very limited empirical literature on the relationship between political discord and volatility on economic interdependence and challenged the currently widely discussed narrative about the decoupling of the US and the East Asian economy.

In the final part of the chapter, I briefly summarized the main tenets of the regional institutional strategies of regional states and the ASEAN and concluded that middle powers and small states are reacting with the strengthening of rules-based plurilateral institutions to the US–China competition and China’s rising assertiveness. I have also argued that China at present does not have the capabilities to assert a hegemonic role in East Asia.

The dissertation aimed to evaluate the overarching research agenda, serving more as a general theme for the project, through the findings of the three sub-research questions. Nevertheless, the more precise answer for the overarching research agenda — *How does the economic architecture in East Asia constrains and augments state power under the conditions of production network interdependence?* — can be introduced here based on the findings discussed above. On the one hand, the case studies and data presented in Chapter 5 and Chapter 6 have shown that production network-based interdependence provides a substantial limit on the effectiveness of exercising economic coercion among

great powers. There is ample room for the targets of economic coercion to dent the costs of punitive measures and restrictions, while GVCs provide a robust decentralized form of de facto economic governance counteracting state actors. This is true even in cases where there is a perceptible asymmetry in interdependence, insofar as the target of coercion can rely on other forms of economic leverage. The clearest case of such a situation was provided by the US exercising its market power and technological power vis-à-vis China, in which cases China's centrality in production meant that US coercion could only secure limited aims and was fairly costly for the US itself as well.

On the other hand, the cases investigated here also conclude that while economic coercion is increasingly less able to secure political aims, it nevertheless produces substantial economic costs both for the target and the coercer under the conditions of production network-based interdependence. This shows that first, nations states, especially great powers, remain central actors in shaping the cost structure of transnationalized production, and second, that domestic-level policies of great powers can have substantial international reach and can levy serious economic costs on the whole system. Hence, in this setting, when state power is used for coercion, it can do considerable damage to the transnational actors engaged in international commerce. As concluded in Chapter 3, state power is also an important factor in shaping economic outcomes through domestic development, such as development and industrial policies, which in turn heavily affect the structure of international production.

Finally, the limitations of this research project need to be addressed. First, as noted earlier, macro-level models of economic interdependence and especially production network dependence are coarse instruments, which can reflect overall tendencies, but are not precise estimations of the diverse and disaggregated nature of economic vulnerabilities. To use once again the example of the effect of Malaysian semiconductor fabrication on Hungarian auto production, while such vulnerabilities can be inferred from macro data showing that Malaysia is an important electronics manufacturing hub and Hungary relies heavily on East Asian electronics imports in its manufacturing industries, the details of such network-dependent vulnerabilities can only be uncovered through case studies.

Second, the estimations regarding the importance of domestic institutions are limited by the variables used, which were identified primarily through data availability. A more detailed analysis of domestic policies would certainly yield more precise insights,

although the aim of this study was to provide an overall picture instead of focused policy research.

It should also be highlighted that while domestic factors and the domestic political economy were referred to throughout the dissertation, this study made no systematic effort to untangle the many layers and actors of the domestic political economy, such as business lobbies, political parties, and other domestic political and economic interest groups. As noted in Chapter 3 and Chapter 5, these actors are important shapers of domestic institutions, domestic policies, and international economic outcomes, and their interests and political role warrant more focused attention, especially in light of the fact that state-level strategic interests and firm-level strategic interests appear to diverge in the US and other developed economies in relation to policies vis-à-vis China, as Chapter 5 alludes to it in its limited discussion on the overall nature of the domestic political economy landscape.

Third, the discussion regarding regional leadership was limited to broad economic structural forces. Neorealist and constructivist understandings of regional order, hegemony, and leadership provide a more nuanced picture of the theory and process of the power transition underway in East Asian presently, albeit these were left out of this discussion due to the limited focus of this study. In other words, the discussion presented here about regional order and regional leadership provides only a limited survey of the forces at hand.

Finally, the study dealt with a limited concept of state power, that of economic power defined in Section 1.6 as the ability to alter international economic outcomes in order to achieve a state's strategic aims. There are various other forms of power—military power, soft power, institutional power, etc.—in the international system, the exercise of which might lead to different political outcomes. In particular, the security aspects of US–China ‘strategic competition,’ and more broadly, the security policies employed by East Asian states with the aim of hedging and balancing against China's rise, were omitted as explanatory variables here, even though these play an increasingly central role in international politics, and consequently, also affect the international economic structure as well. Hence, this study provides only a limited explanation of state power, and the exercise thereof in the international system.

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8 Appendix

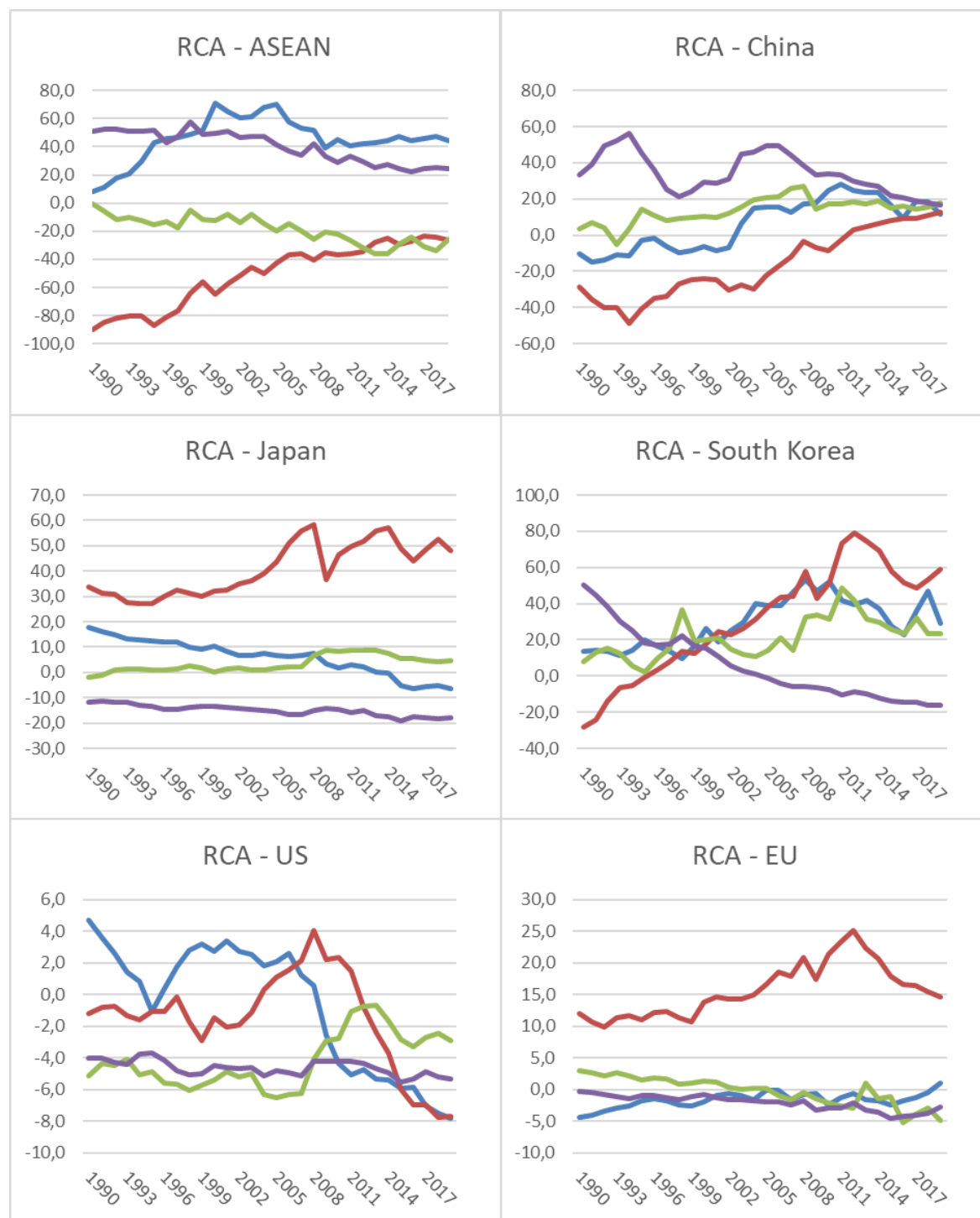
8.1 Appendix I.

Table 32. Product groups used for the hubness and unit value calculations.

[8542] Electronic integrated circuits	[8544] Insulated wire, cable and other electric conductors, connector fitted or not; optical fibre cables of individually sheathed fibres, whether or not assembled with electric conductors or fitted with connectors
[8517] Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data (including wired/wireless networks), excluding items of 8443, 8525, 8527, or 8528	[8486] Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor boules or wafers, semiconductor devices, electronic integrated circuits or flat panel displays; machines and apparatus specified in note 9-C to this Chapter
[8471] Automatic data processing machines and units thereof, magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included	[8523] Discs, tapes, solid-state non-volatile storage devices, smart cards and other media for the recording of sound or of other phenomena, whether or not recorded, including matrices and masters for the production of discs, excluding products of Chapter 37
[8541] Diodes, transistors, similar semiconductor devices; including photovoltaic cells assembled or not in modules or panels, light-emitting diodes (LED), mounted piezo-electric crystals	[8504] Electric transformers, static converters (e.g. rectifiers) and inductors
[8708] Motor vehicles; parts and accessories, of heading no. 8701 to 8705	[8704] Vehicles; for the transport of goods
[8703] Motor cars and other motor vehicles; principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars	[8479] Machinery and mechanical appliances; having individual functions, n.e.c. in this chapter
[8443] Printing machinery; used for printing by means of plates, cylinders and other printing components of heading 84.42; other printers, copying machines and facsimile machines, whether or not combined; parts and accessories thereof	[8534] Circuits; printed
[8473] Machinery; parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines of headings 84.70 to 84.72	[8529] Transmission apparatus; parts suitable for use solely or principally with the apparatus of heading no. 8525 to 8528
[8411] Turbo-jets, turbo-propellers and other gas turbines	[8543] Electrical machines and apparatus; having individual functions, not specified or included elsewhere in this chapter
[8536] Electrical apparatus for switching, protecting electrical circuits, for making connections to or in electrical circuits, for a voltage not exceeding 1000 volts; connectors for optical fibres, optical fibre bundles or cables	[8528] Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus

8.2 Appendix II.

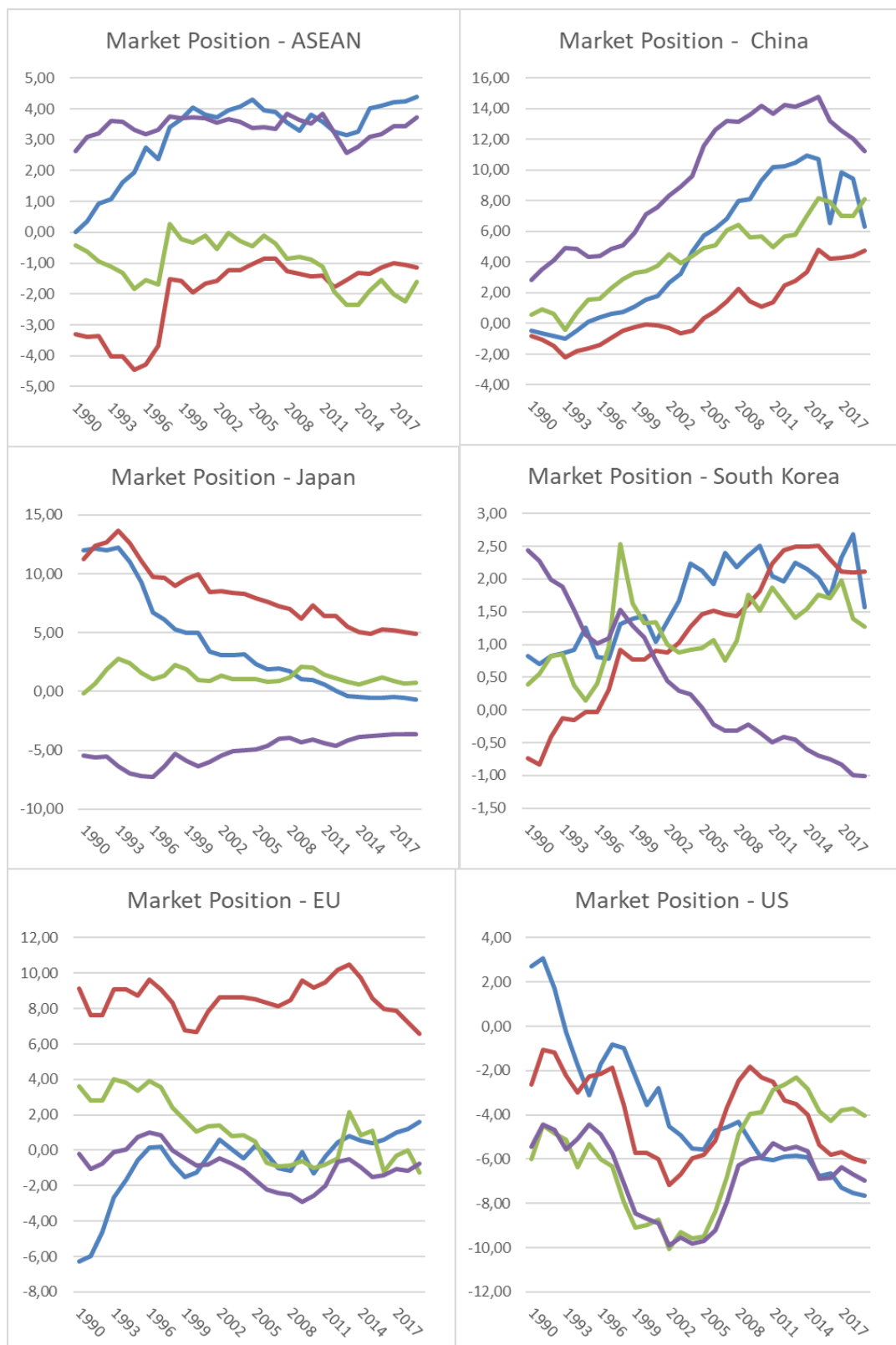
Figure 31. RCA by technological level.



Source: De Saint-Vaulry (2008)

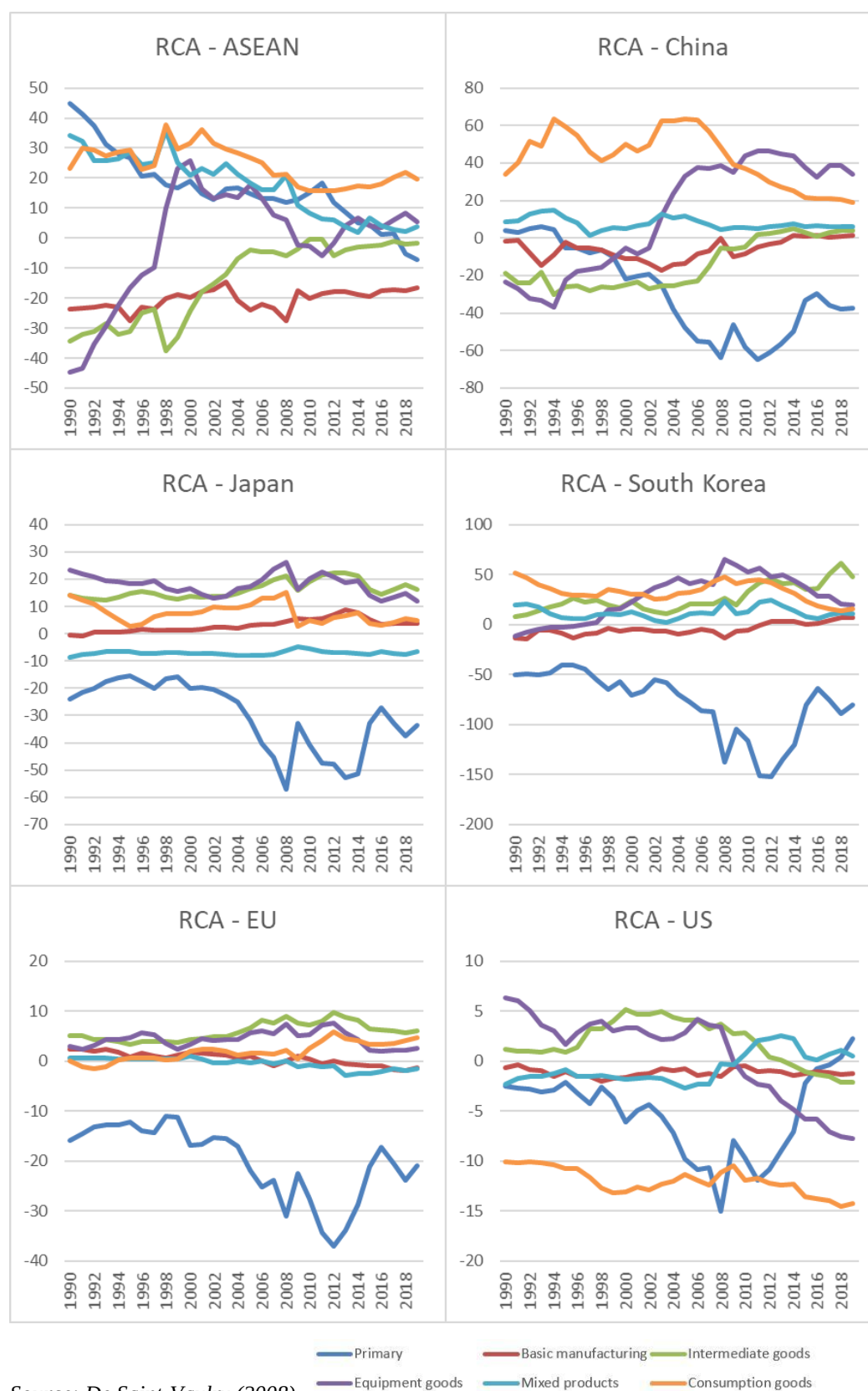
— High-tech — Intermediate-high tech — Int.-low tech — Low-tech

Figure 32. Market position by technological level.



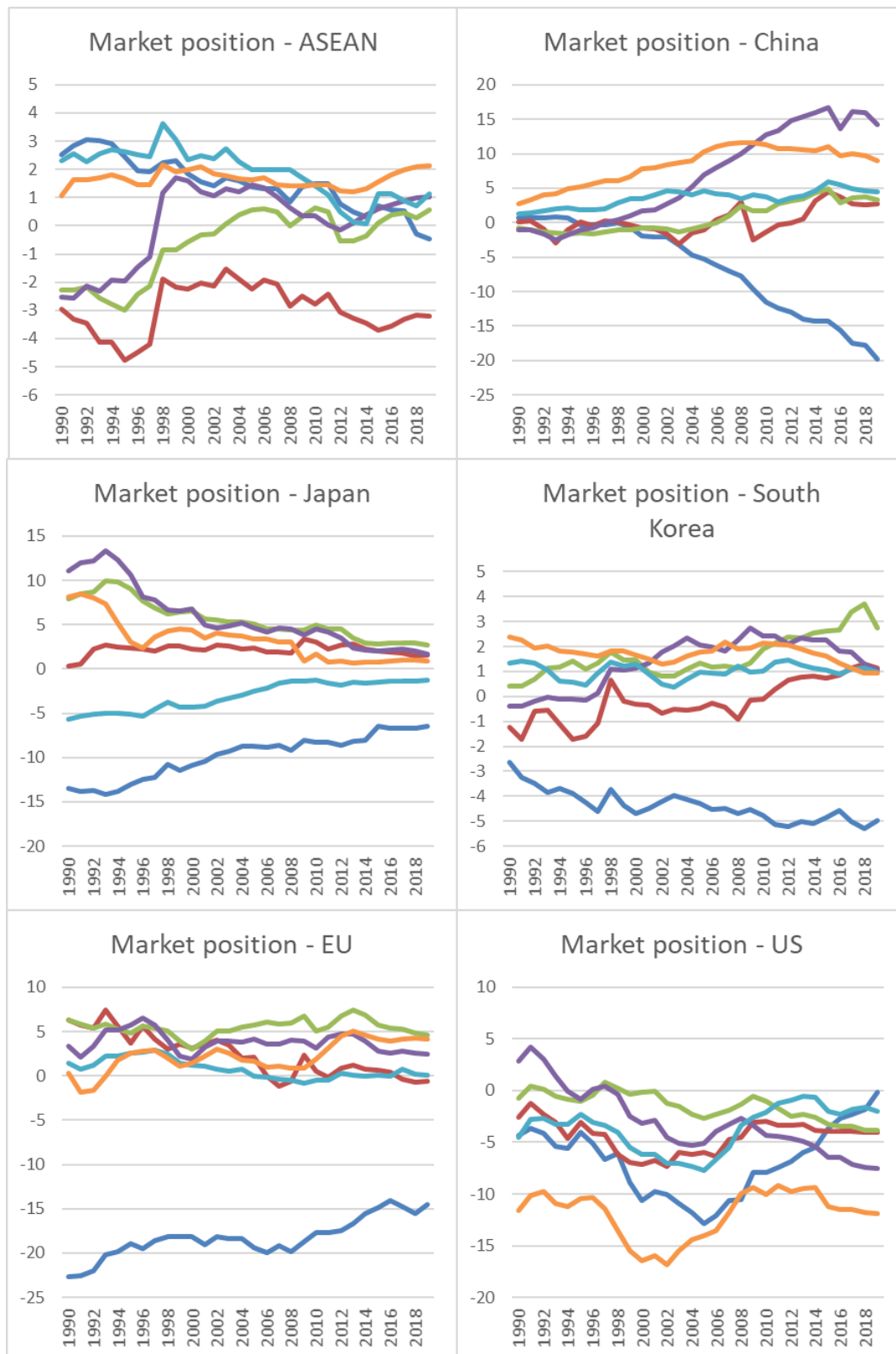
Source: De Saint-Vaulry (2008)

Figure 33. RCA by production stage.



Source: De Saint-Vaulry (2008)

Figure 34. Market position by production stage.



Source: De Saint-Vaulry (2008).

8.3 Appendix III.

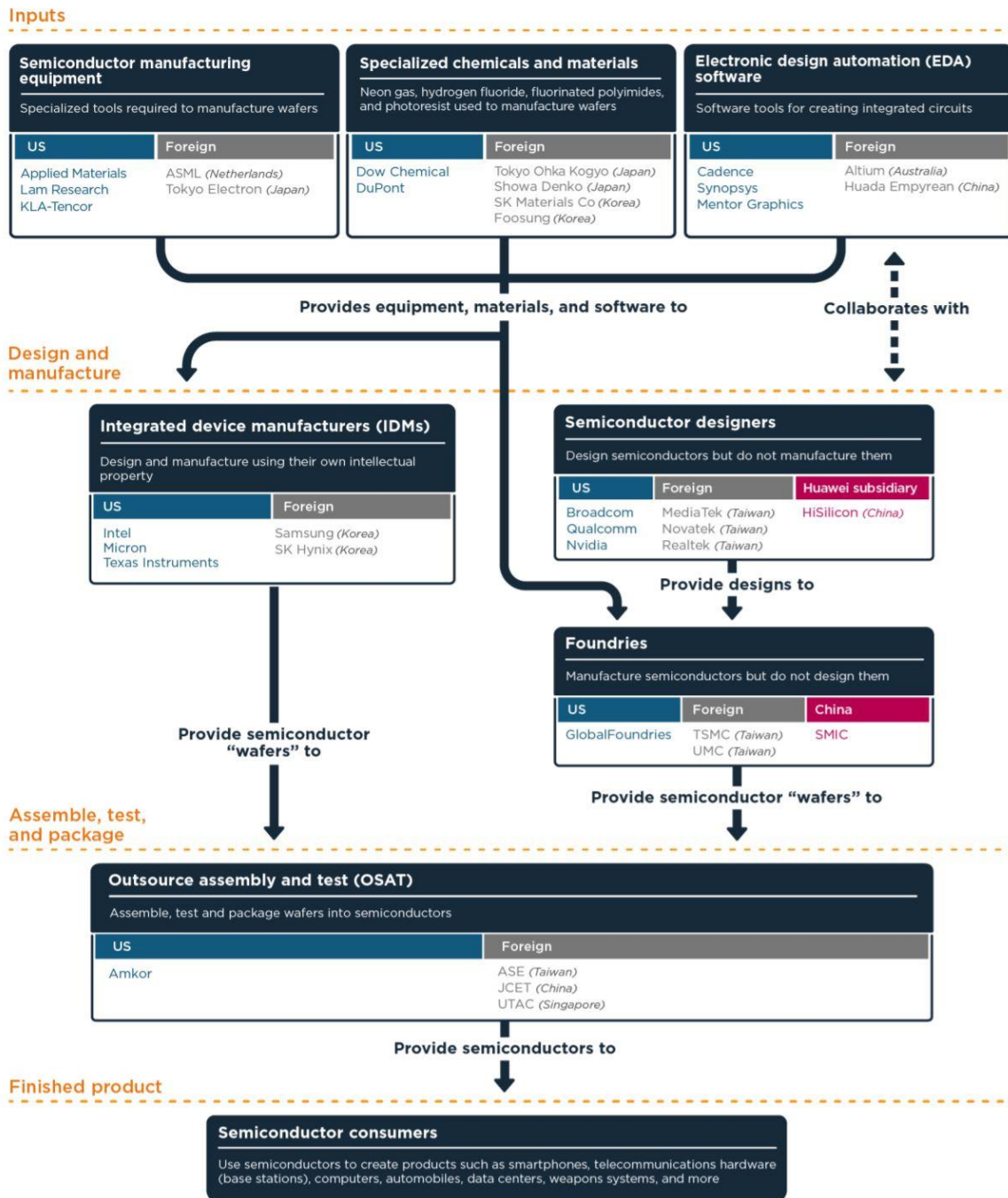
Table 33. Sector codes used in the ADB MRIO.

Sector	code
Agriculture, Hunting, Forestry, and Fishing	1
Mining and Quarrying	2
Food, Beverages, and Tobacco	3
Textiles and Textile Products	4
Leather, Leather Products, and Footwear	5
Wood and Products of Wood and Cork	6
Pulp, Paper, Paper Products, Printing, and Publishing	7
Coke, Refined Petroleum, and Nuclear Fuel	8
Chemicals and Chemical Products	9
Rubber and Plastics	10
Other Nonmetallic Minerals	11
Basic Metals and Fabricated Metal	12
Machinery, Nec	13
Electrical and Optical Equipment	14
Transport Equipment	15
Manufacturing, Nec; Recycling	16
Electricity, Gas, and Water Supply	17
Construction	18
Sale, Maintenance, and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	19
Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	20
Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	21
Hotels and Restaurants	22
Inland Transport	23
Water Transport	24
Air Transport	25
Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	26
Post and Telecommunications	27
Financial Intermediation	28
Real Estate Activities	29
Renting of M&Eq and Other Business Activities	30
Public Administration and Defense; Compulsory Social Security	31
Education	32
Health and Social Work	33
Other Community, Social, and Personal Services	34
Private Households with Employed Persons	35

8.4 Appendix IV.

Figure 35. The semiconductor value chain.

The stages and examples of companies involved in the semiconductor design and manufacturing supply chain



Source: Bown (2020, p. 19).

8.5 Appendix V.

Table 34. *The Goldstein-scale.*

-10.0	Military attack, clash, assault	0.0	Explain or state policy, state future position
-9.2	Seize position or possessions	0.1	Ask for information
-8.7	Nonmilitary destruction/injury	0.6	Surrender, yield to order, submit to arrest
-8.3	Noninjury destructive action	0.6	Yield position, retreat, evacuate
-7.6	Armed force mobilization, exercise, display, military buildup	1.0	Meet with, send note
-7.0	Break diplomatic relations	1.2	Entreat, plead, appeal to, beg
-7.0	Threat with force specified	1.5	Offer proposal
-6.9	Ultimatum, threat with negative sanction and time limit	1.8	Express regret, apologize
-5.8	Threat with specific negative nonmilitary sanction	1.9	Visit, go to
-5.6	Reduce or cut off aid or assistance, act to punish/deprive	1.9	Release and/or return persons or property
-5.2	Nonmilitary demonstration, walk out on	2.0	Admit wrongdoing, apologize, retract statement
-5.0	Order person or personnel out of country	2.5	Give state invitation
-4.9	Expel organization or group	2.8	Assure, reassure
-4.9	Issue order or command, insist, demand compliance	2.8	Receive visit, host
-4.4	Threat without specific negative sanction stated	2.9	Suspend sanctions, end punishment, call truce
-4.4	Detain or arrest person(s)	3.0	Agree to future action or procedure, to meet or to negotiate
-4.1	Reduce routine international activity, recall officials	3.4	Ask for policy assistance
-4.0	Refuse, oppose, refuse to allow	3.4	Ask for material assistance
-4.0	Turn down proposal, reject protest, demand, threat	3.4	Praise, hail, applaud, extend condolences
-3.8	Halt negotiation	3.6	Endorse other's policy or position, give verbal support
-3.4	Denounce, denigrate, abuse	4.5	Promise other future support
-3.0	Give warning	4.5	Promise own policy support
-2.4	Issue formal complaint or protest	5.2	Promise material support
-2.2	Charge, criticize, blame, disapprove	5.4	Grant privilege, diplomatic recognition, de facto relations
-2.2	Cancel or postpone planned event	6.5	Give other assistance
-1.9	Make complaint (not formal)	6.5	Make substantive agreement
-1.1	Grant asylum	7.4	Extend economic aid, give, buy, sell, loan, borrow
-1.1	Deny an attributed policy, action, role or position	8.3	Extend military assistance
-0.9	Deny an accusation		
-0.2	Comment on situation		
-0.1	Urge or suggest action or policy		
-0.1	Explicit decline to comment		
-0.1	Request action, call for		

Source: *Goldstein (1992)*