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# Shaping a Digitalising Infrastructure: Logistics and the Dynamics of Chinese-Southeast Asian E-Commerce

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# Shaping a Digitalising Infrastructure: Logistics and the Dynamics of Chinese-Southeast Asian E-Commerce

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2023

## Abstract

The paper seeks to examine logistics related to e-commerce in Southeast Asia (i.e. domestic and cross-border movement of goods). The major argument made is that e-commerce success increasingly revolves around the forms of logistics and as such, we need to understand the major directions.

Drawing on the literature examining infrastructure, the paper examines two perspectives on logistics. Firstly, an *STS (Science and technologies studies)* approaches allows us to unpack the tensions between globally "deregulated logistic regimes" and Chinese "point-to-point e-commerce regimes" in the region. Secondly, bringing these two regimes into debates around *infrastructure-led development* allows us to consider the broader political economy and economic rivalry embedded within the installation of these logistics regimes.

Through analysis of Thailand, we argue that Chinese e-commerce regimes provide a potentially useful direction to allow states to better manage challenges and provide opportunities for domestic firms. However, given that key nodes of e-commerce logistics are primarily controlled by Chinese actors, they potentially skew e-commerce and trade further towards China. In particular, the forms and control of platforms, rules and logistics are likely to position digitalised Southeast Asian firms as low-value digitalised producers, and China as adding value.

# A. Introduction

This paper seeks to track the evolution of cross-border e-commerce in Southeast Asia in relation to China. Revisiting established technologies to think about their broader economic impacts is crucial as they scale in order to consider the links between the expanding internet and the digital economy. This is of particular interest in Southeast Asia where e-commerce has significantly scaled and is widely used, including a growing reach to more marginal users (as consumers and platformized sellers).

The paper analyses e-commerce in Southeast Asia focusing on the *logistics* of e-commerce. It seeks to answer the following research question: *How is logistics shaping e-commerce directions in Southeast Asia?* The case for taking a logistics perspective, I will argue, is that e-commerce can increasingly be seen as a *competition in logistics* where leading firms are able to build efficient or innovative logistics models. This is reflected in the growing in-house development and capital investment in logistics by multinational e-commerce firms.

This work aligns with growing scholarship that seeks to integrate analysis of (e-commerce) platforms and infrastructure to consider the techno-political aspects of e-commerce (Foster & Bentley 2022, Shen & He 2022). By taking an infrastructural perspective, the paper will particularly focus on the enduring and institutional components of logistics as it operates in Southeast Asia. This directs attention beyond specific e-commerce firms towards the broader logistics rules and relations that shape how countries in Southeast Asia are integrated within e-commerce. An infrastructural perspective also allows the paper to move beyond a purely technical analysis.

In line with the recent growth of scholarship on "infrastructural-driven development", we identify competing models of e-commerce logistics that might be mapped into the broader political economy. Longer-running global "deregulated logistics regimes" look towards e-commerce logistics as a highly deregulated model of trade. However, as Chinese firms have expanded in the region, they have pushed disruptive "point-to-point regimes" where specific e-commerce outposts in the region become spokes of a Chinese-led logistics network. We discuss tensions between these regimes within Southeast Asian countries[1].

Overall, this paper is significant in that it more overtly highlights competing logistics models and their implications. These have been somewhat discussed previously within the literature on logistics and amongst policy experts. Here, through the use of infrastructure perspectives, these more technical/policy discussions are mapped more substantially into broader implications for the digital economy, and aligned with broader rivalry and ideas of infrastructure-led development. Further, given that recent regional studies and geography scholarship have tended to dwell on macro-level discussions of infrastructure-led development, this work seeks to more closely link these discourses to details of a specific case of infrastructure development.

[1] Although beyond the scope of this paper, such tensions form part of broader global discussion of e-commerce.

The case of Thailand and e-commerce is used to focus the discussion. Some of the implications and tensions of the competing regimes of logistics are discussed, building on an extended analysis of e-commerce logistics. The paper is particularly based on a multi-sited study undertaken in 2019 in China and Thailand. The discussion comes from qualitative interviews with 17 actors from a broader set of interviews on the digital economy in the two countries. In China, discussion was mainly with policy makers, advisors and researchers who have worked on the new "cross-border e-commerce" rules discussed in the paper, to understand the detail, motivation and implication of policies as they go out. In Thailand, interviews were undertaken with e-commerce firms (local and regional e-commerce platforms managers, ecosystem firms in logistics, and firms selling on platforms) and policy actors (logistics and broader digital economy).

The paper proceeds as follows: in the next section core notions of logistics and frameworks of infrastructure are introduced. Based on the case of China and Southeast Asia we then introduce the two major logics of e-commerce logistics infrastructure: "global deregulated logistics regimes" vs the "Chinese point-to-point e-commerce regimes" describing the potentials and challenges of such models. Following this, the discussion of Thailand allows us to elaborate on these technical discussions and consider some of the broader political economy. We then reflect on the implications of these competing regimes.

# B. Approaching logistics in e-commerce

## B1. E-commerce - a competition of logistics firms?

### B1.1 Definitions of logistics

Logistics is a term used to outline the "integration of physical transport modes (ships, containers, trucks) with information-based inventory control (computer tracking, order processing, delivery information)" (Coe 2020 p.2, following De Lara 2019). Although arguably less directly researched than other aspects of production, logistics has increasingly been accepted as a core component of agile and efficient production chains in modern capitalism. Historically supply chains have tended to differentiate between *stages of production* and *processes* of production (including those related to the *supply of intermediate goods* and/or *distribution of finished goods)*. However, one might argue that the *logistics* and *production* aspects of operations are increasingly overlapping (Rodrigue & Hesse 2006). Where just-in-time production (JIT) and flexible customer distribution are at the heart of modern process innovation, it is logistics that enable such models to be viable (Coe 2020, Coe & Hess 2013).

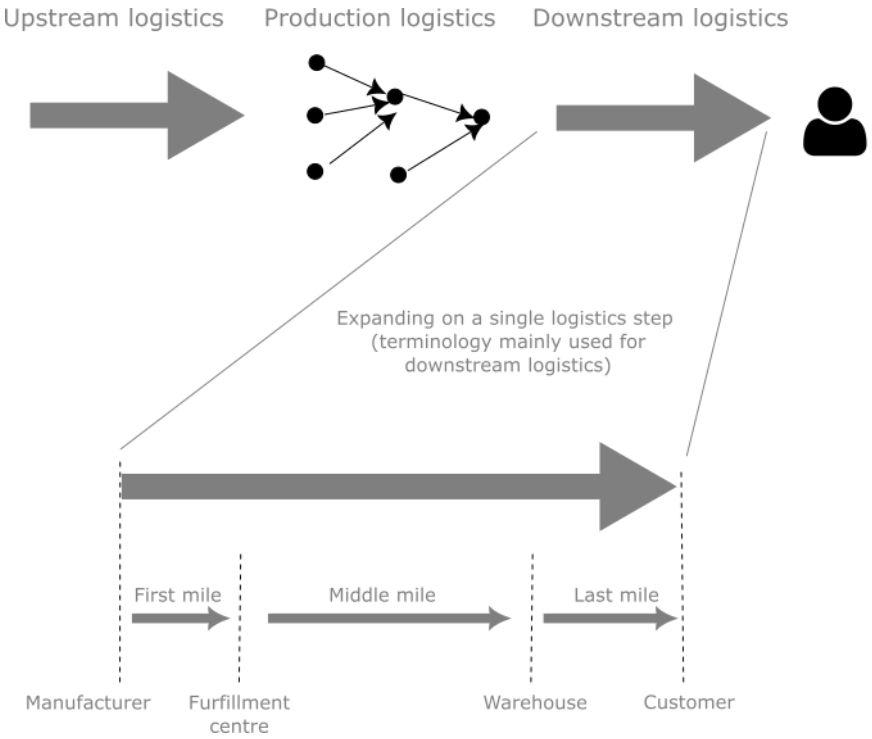


**Figure 1: Key concepts of logistics. Source: Author's construct**

Several useful logistics terms are highlighted as shown in **Figure 1**. First, it is useful to differentiate the stages of logistics. Upstream logistics refers to activities that occur prior to production, including management of inputs, suppliers and procurement. Production logistics relates to the specifics of the production supply chains, including semi-finished goods.

Downstream logistics is focused on the final distribution stage of finished goods to the customer (Morana & Morana 2018). A recent terminology in the logistics industry (typically used for downstream logistics in e-commerce) is to break a single logistics stage down to differentiate between the so-called first-mile, middle-mile and last-mile (Lara & Wassick 2023). Thus, where logistics become more complex in the downstream stage, goods may follow several steps: a manufacturer may first deliver a good the first mile to a fulfilment centre. In the middle mile, goods are organised and distributed to different warehouses in preparation for delivery. In the last mile, goods are delivered to the final stage to the customer.

Each step might be outsourced to third parties, including the possibility of multiple actors being involved. E-commerce logistics should be seen as an area at the forefront of debates on logistics. The main focus of discussion has been within the realm of downstream logistics which often revolve around more disruptive innovations and where effectively reaching the end-consumer is core to the value of e-commerce[2].

[2] Business-to-business e-commerce and other integrated digitalisation of purchasing in supply chains can be an important part of rapid and dynamic production. But analysis of logistics in these cases is beyond the scope of this paper.

Much of the literature on logistics focuses on firm strategy and the management of supply chains. However, it is important to also consider the broader institutions and longer-running *resources, rules and relations* that are shaping the norms of logistics. This is important in that it moves the scope of analysis beyond the realms of specific firms and their short-term business models. Such an approach allows an analysis of broader sectoral dynamics including a strong analysis of the state and, in the case of international logistics, an analysis of trading relationships.

**B1.2 Contemporary e-commerce logistics**

Logistics is a vitally important component of e-commerce. The emergence of *e-commerce marketplace platforms* has particularly spurred more radical changes in logistics, where a disparate group of platform sellers will require logistics. In marketplace models, platforms were originally seen as "orchestration actors", organising platformized marketplace sellers and enabling third-party services to support platform functionality (Tiwana 2014). For logistics, this has commonly occurred in how platforms partnered with third-party logistics providers. Platformized sellers would then tightly integrate with these logistics firms in their downstream logistics arrangements, with the platform firm itself taking a back seat. As e-commerce has grown, these forms of outsourced e-commerce logistics have limitations.

Firstly, e-commerce is becoming associated with very rapid delivery in last-mile logistics. Next-day service (or even next-hour services in big cities) have become a core competitive aspect in leading countries. Middle-mile innovations are also the basis for e-commerce platforms to build their business models including so-called online-to-offline and/or omnichannel selling (where e-commerce is integrated with bricks-and-mortar stores). Some novel business models such as perishable goods (i.e. fruit and vegetable e-commerce in Asia) may demand more disruptive changes not only in the downstream logistics but also in new requirements for production and supply logistics.

Secondly, e-commerce pushes new logistics requirements that have been less considered. In the last mile of logistics, for example, this can relate to returns in some sectors such as clothing (Johnston 2023). This dynamic is expanding often as a result of e-commerce marketing free returns and/or the ability for customers to try or examine multiple goods to compete with bricks-and-mortar retail. While third-party logistics companies have looked to upgrade their "reverse value chains", increasing volumes are often challenging and environmentally controversial for outsourced actors.

Thirdly, logistics challenges are amplified when leading e-commerce platforms become international, operating across multiple jurisdictions with requirements for seamless cross-border e-commerce services. This may require additional logistical resources and activities in areas such as cross-border shipping, customs clearance and warehousing.

The response of platforms to these logistical challenges has been variable. A "low-end" path is that platforms continue to rely on outsourcing to low-cost, third-party logistics. This keeps the price of goods for consumers lower, where the logistics risks that emerge (i.e. delays, returns, quality declines, cross-border limitations) are borne by the consumer within the lower price. For platforms that desire high-end, branded and "value-added" roles, however, the alternative has been active investment into in-house logistics. The flagship example of

this has been the mainstreaming of "Prime" logistics services within Amazon. This has been enabled by large-scale investments in hi-tech in-house FBA (fulfilled by Amazon) services that support expanded warehousing and rapid last-mile logistics (Weigel 2023). Increasingly, such features are central to platform operations. Amazon sellers, for instance, are now almost compelled to use FBA in some regions, with searches algorithmically favouring FBA sellers (Mitchell 2021).

In China, somewhat parallel patterns are seen. Alibaba, for example, has historically outsourced downstream logistics to different providers. Increasingly they have taken a more strategic position through which Alibaba's Cainiao offshoot has come to the fore – a strategic partnership between Alibaba and four leading Chinese logistics firms (YTO Express, STO Express, ZTO Express and Yun Da Express) (eCommerceIQ 2016).

This extended discussion of logistics underlines a provocative argument: e-*commerce firms* now primarily see themselves as *logistics firms*. As competition tightens, firm value-added and innovation is increasingly associated with logistics, leading to growing focus and investment. Much is at stake here. Platforms (including e-commerce platforms) have a tendency to rapidly scale. This can be vertically in terms of "winner-takes-all" network effects across a specific area and "vertical integration" as firms expand into complementary functions in the digital economy (Srnicek 2016). As such, leading platforms are likely to be highly concentrated, and so it is important to establish a first-mover leading position. In the longer term, controlling strategic positions will enhance the ability to project power across production and consumption stages with implications for future trajectories of the (digital) economy.

## B2. Perspectives on infrastructure

Infrastructure has been associated with multiple meanings across social and engineering sciences. Within its name, the term *infra*structure (infra: below, beneath, amongst) focuses on the underlying, larger-scale and more durable role that certain resources play in shaping everyday actions, the economy and society (Dourish & Bell 2007). However, as a concept, the term is often used flexibly

> *"….infrastructure is fundamentally a relational concept…within a cultural context, the cook considers the water system as working infrastructure integral to making dinner. For the city planner or the plumber, it is a variable in a complex planning process of target for repair" (Star & Ruhleder 1996)*

The changing focus of the literature on infrastructure is discussed below to support a clear approach to the analysis of e-commerce logistics.

### B2.1 STS views

The changing perspectives on infrastructure are often seen to mirror the forms and roles it is playing in society. In the 20th century, infrastructure was a centrally planned and managed resource, often controlled by state actors to ensure orderly operation and use (e.g. Hughes 1993). With the emergence of neoliberal capitalism, many countries have reorientated towards public-private partnerships in the management of public resources. This has led to a shift towards infrastructure being unbundled through a whole swathe of coordinating

agencies and private firms with a growing role of digital systems to tie these actors together (Graham & Marvin 2001). It is this network of resources and actors that implies an in-depth analysis from STS perspectives to consider the complexity of technical resources, actors and relationships.

Earlier definitions often described infrastructure as those resources frequently "invisible" in their everyday use, imploring the researcher to integrate analysis of these often mundane resources - technical standards, wires, and transport configurations that underlie broader practices (Star 1999). In terms of analysis of information, infrastructural approaches have particularly been taken up within the information infrastructure literature of the 1990s and 2000s in hand with the growing complexity and broader scope of information resources beyond the organisation (Ciborra et al. 2000, Hanseth et al. 1996). This came in response to the suggestion that conventional information systems modelling, analysis and design, often focussed at an organisational level, poorly fitted with resources that were multi-layered, path-dependent, "open-ended and in part out of control" (Ciborra et al. 2000, Monteiro & Hanseth 1996).

Infrastructural studies of technical systems therefore more strongly draw on Science & Technology Studies which make a more open analysis of the socio-technical processes of negotiation, compromises, standardisation and layering of different technologies within complexities of infrastructure (Bowker & Star 2000, Monteiro 2000). With the expansion of the internet, analysis of infrastructure arguably took on a new significance as large-scale computing infrastructure began to control and shape a wide array of our ambient experiences, actions and economies (Dourish & Bell 2007, Edwards et al. 2009).

Therefore within a similar vein to information scholars, work in geography has undertaken parallel approaches (Graham & Zook 2013, Graham & Marvin 2001, Kitchin & Dodge 2011), augmenting the analysis of technical resources to examine the way that (contrary to the ideas of the spacelessness of the internet) the mediation between space and digital infrastructures embeds significant socio-economic implications.

**B2.2 Infrastructure-led development**

A major turning point for infrastructure was the 2008 financial crisis. Increasing flows of free capital, embedded for example within monetary policy and quantitative easing, have supported the global expansion in private capital available to invest within large scale 'infrastructural' projects (airports, internet cables, ports, etc.) (Clark 2017).

This has led to a parallel literature on infrastructure that examines these large-scale infrastructure projects in more detail. This perspective particularly comes from the urban & regional studies and geography literature and highlights how infrastructures are increasingly core to how countries (both leading and following) construe and shape development. Infrastructure-led development stresses a move beyond more analysis of complex systems towards integrating an economic and political economy analysis of infrastructure – which is increasingly shaping and ordering spaces (Easterling 2014, Gupta et al. 2015). As large-scale infrastructural projects emerge they define increasingly wide-ranging constellations. They are said to shape national visions and actions around development.

For rising powers, such as China, large-scale infrastructure projects such as the Belt-and-Road project are core to their development visions related to 'going out', and embed broader geopolitical visions (Schindler et al. 2022). For smaller and emerging states, infrastructure-led development offers opportunities for new visions of development as countries look to exploit outside investments to upgrade their infrastructure and better integrate their economies into global capitalist circuits (Schindler & Kanai 2021). In these debates, infrastructure is no longer invisible but highly visible within flagship projects, and a contested source of political economy (Easterling 2014, Larkin 2013).

Such infrastructure-led development literature, partially in line with its disciplinary focus, moves away from the analysis of technical systems into broader-brush tracking of (urban) investment, capitalist projects and geopolitics. It can, therefore rather underplay the materiality of complex technologies in favour of other concerns around "infrastructural power" and development pathways.

In sum, our analysis seeks to combine these two perspectives more closely. In the following sections, we use this dual approach to more broadly and technically outline the case of e-commerce logistics and policy (section 3) and then discuss the outcomes in terms of political economy and infrastructure-led development (section 4).

# C. Global and Chinese e-commerce logistics

## C1. Cross-border e-commerce logistics

E-commerce has taken place following distinct patterns as shown in **Figure 2** and discussed below:

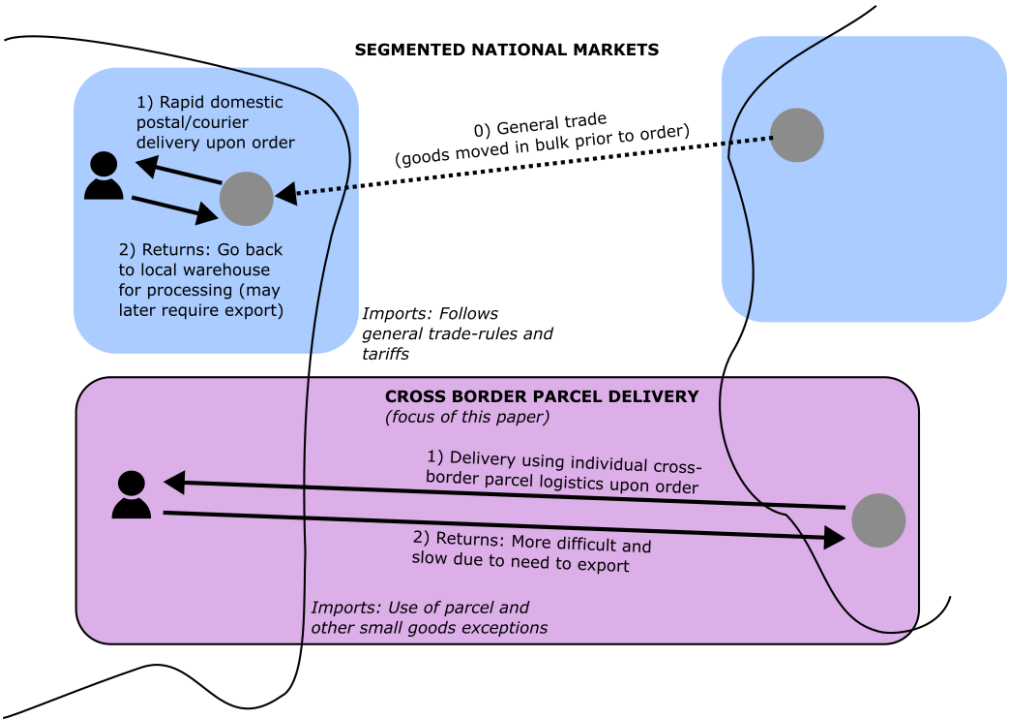


**Figure 2: Two common modes of logistics in e-commerce. Source: Author's construct**

The first pattern of logistics is common in larger countries where platforms have stronger domestic activity. Sellers offer a broad array of goods available through domestic warehouses, ready for "last mile" logistics. Likely some goods have come from international origins which will be sourced in advance. Such goods will typically be shipped across borders through general (bulk) trade. However, with the scaling of e-commerce across the global south, large amounts of e-commerce follow another model which will be the main discussion of the paper.

Cross-border logistics can occur in several major scenarios. Firstly, even where e-commerce platforms have segmented markets they may not domestically warehouse all goods. Some percentage of goods (e.g. where platforms sell more niche "long-tailed" products) may require importing post-purchase or certain platforms (smaller or low value) may choose to trade through cross-border platforms. Secondly, and most crucially, in many regions, cross-border delivery of goods is more common. In particular, this is a common model in regions such as Africa and Asia where e-commerce platforms operate across multiple smaller countries. Servicing smaller populations profitably may require lower or no warehousing of goods domestically. Thus cross-border delivery on purchase allows platforms to offer a variety of products without the challenges of domestic warehousing. Thirdly, a poorly understood aspect of e-commerce in the global south is that many customers are not end-consumers, but informal traders. Such actors often deliberately seek out cross-border products. For example, traders in Southeast Asia often now source goods online on Chinese platforms and then resell them locally. They deliberately purchase goods from e-commerce sites located outside their borders.

In the cross-border pattern, the "middle mile" and "last mile" of downstream logistics are more integrated. Goods will be warehoused in bulk in one country (a leading regional country or the original site of production such as China). Such orders, being for individual or small batch goods, are shipped through international couriers as small packages and potentially onto domestic delivery/postal services.

## C2. Global deregulated logistics regimes

Small package logistics, commonly used in cross-border e-commerce has a notably different regulatory environment to general trade. Rather than going through the system of documentation and declarations that are part of general trade, these small package logistics tend to move outside rules and regulations. Small packages are often subject to lower monitoring as they were originally seen to be related to low-value goods moving between individuals. Governments should therefore follow the mantra that "…when the costs of clearance procedures outweigh the revenues collected on imported goods… it is clearly inefficient to spend resources on the collection effort." (UN.ESCAP 2019 p.32).

In line with this position, most countries have so-called "de-minimis" rules where such individual packages below a certain value are not subject to general trade rules. Goods arriving through such small packages may not apply trade tariffs. Other types of regulation such as phytosanitary checks may also be less rigorously applied compared to general trade. This then is the reality of logistics where cross-border e-commerce logistics expands – an increasing amount of goods are shipped as individual packages, subject to lower regulation, and at times lower taxes.

The cross-border model appropriates these rules around small packages to enable e-commerce goods movement. This then leads to questions about whether this is a suitable regulation model for cross-border e-commerce logistics moving forward. The model can become highly problematic in several ways. In the short term, small package trade can come up against limitations within importing nations with the expansion leading to challenges in handling of such parcels in bulk. This can lead to significant delays and potential risks due to the inability to monitor packages. Discussions of small package trade also highlight a wealth of other issues including correct application of tax, quality control, inspection and appropriate quarantine, international payments, returns, and capacity of cross-border logistics providers.

When e-commerce is in its infancy in a country, the challenges of small package logistics might be a small inconvenience. But with e-commerce expansion, it poses major regulatory challenges. Goods that go through general trade are supported by regular tariffs, rules and taxes. However, these are less effective as more goods move through small package delivery. Such trends might, therefore, reduce the ability of countries to undertake certain industrial policies on trade (i.e., through tariffs on specific trade codes to support local industry), they risk eroding the tax base and can be central to the economic cannibalisation of domestic firms through imports.

These critiques might suggest that it would be prudent for countries of the global south to reduce their reliance on cross-border small package logistics in the long term. However, so far this has not occurred systematically. In fact the opposite is happening where debates and pressure within global "e-commerce trade" and "digital trade" increasingly pressure countries to further deregulate small packages logistics in the name of "development".

Such directions have particularly been led by large platforms, global logistics firms and cross-border payment providers who seek to develop such models. Such firms have been active in lobbying at regional and global levels – for example, in pushing for lower regulation on small packages or higher "de minimis" thresholds to allow more goods to pass through this method. Multi-lateral discussions such as those within the WTO and regional agreements have begun to touch on these topics, with the ultimate goal to apply more binding global rules in these types of scenarios to normalise deregulated small package governance, maximise de minimis, and discipline countries that seek to regulate e-commerce logistics in other ways.

Other actions in this area have also been important in pushing claims that this regime is developmentally optimal for the global south. This has included recruiting platformized sellers (SMEs) in the global south who are exporting through e-commerce. So it is argued, such "micro multinationals" are increasingly selling across multiple countries and facing challenges in terms of uneven rules around logistics. Through "e-commerce for development" or "aid for e-trade", trade logistics (small package trade) is seen as a key of pushing development for such SMEs. This discourse has been effective, but underplays the fact that such firms are only a tiny percentage of platformized sellers in many countries. Indeed, the majority of cross-border delivery is done by large platformized sellers (Chen & Wu 2016). Part of such deregulatory drives is also in supporting small package trade to become more efficient. This comes in terms of development finance investment in hi-tech

logistic centres and/or global donors supporting public sector computerisation of customs and capacity building.

In sum, from this global perspective small package logistics is core to e-commerce. The solution to issues around small packages and cross-border logistics is on enhancing "global deregulated logistics regimes" for small packages, to ensure cross-border trade is more efficient both in terms of goods flows and customs/taxes.

## C3. Chinese point-to-point e-commerce regimes

### C3.1 Background of Chinese e-commerce expansion

Domestically e-commerce in China began to reach the limits of its growth in the mid-2010s (Alibaba Group 2019, JD 2019). With the growing competitiveness of the sector, even in lower-tier cities, it meant that rapid expansion in China was far more difficult. There are also broader economic reasons that point towards limited growth in the sector domestically. The Chinese government has pushed the notion of a "new normal" and more modest national growth going forward and there are potential conditions for contraction in markets due to trade wars and as a result of the COVID-19 pandemic.

In such circumstances, in e-commerce, a stronger focus on foreign markets provides a potential option to diversify, support further expansion and reduce business risks and this is seen in Chinese statistics which show an expansion in cross-border e-commerce over the previous decade (Foster & Azmeh 2020). The expansion, and the relative weighting of exports and imports in e-commerce is shown in **Figure 3**. In the rapidly growing Asia-Pacific market, Chinese e-commerce makes up about 80% of all cross-border e-commerce (UN.ESCAP 2019).

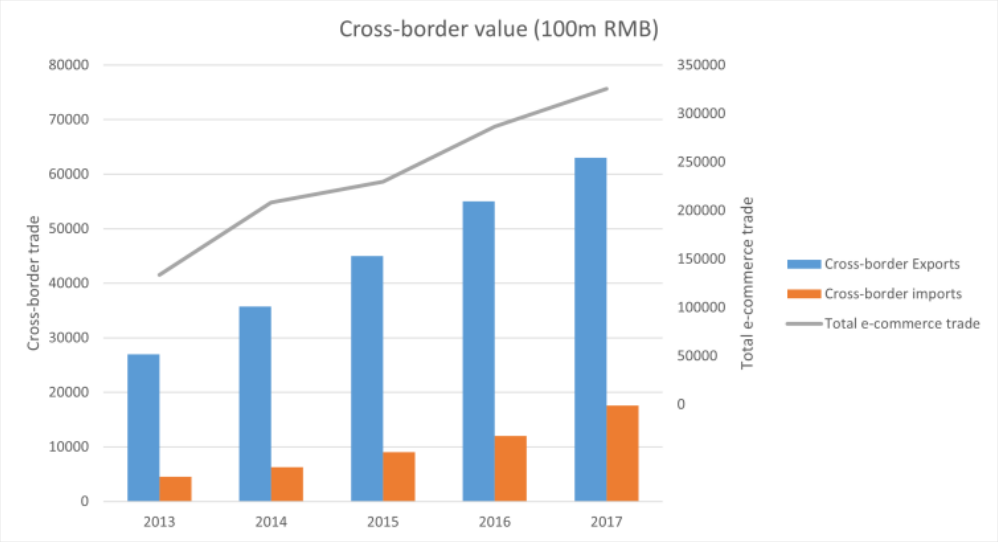


**Figure 3: Cross-border Chinese e-commerce growth. Source: Adapted from E-commerce Research Centre 2019**

These trends in e-commerce also align with changing national agendas in China. Global economic expansion, technological upgrading and innovation are becoming central to

national agendas in China. The 12th Five-Year Plan made an emphasis on Chinese firms "going out" to transform the economy through modernisation and innovation. In the 13th Five-Year Plan, one of the principal mechanisms by which these processes will be driven is through digital technologies, supported by large Chinese digital firms (Hong 2017).

As a flagship strategy underneath these overarching plans, the Belt-and-Road Initiative (BRI) looks to establish improved economic partnerships as well as infrastructure upgrading along key strategic corridors. With growing interest in the digital economy and digitalisation, there has been a particular growth in interest in a "digital silk road" becoming an important prong of the BRI (Liu & Liu 2018, Shen 2018). As outlined by a Ministry of Commerce spokesman in 2015, policymakers see e-commerce as a crucial prong of such actions, "cross-border e-commerce is a new model for foreign trade development, and an effective way to expand overseas marketing channels and achieve foreign trade transformation and upgrading" (Aliresearch 2015 p.6).

**C3.2 Reforming logistics for e-commerce**

The critical account of small package logistic models in e-commerce in the previous section points towards systematic challenges. Chinese policy makers are well aware of this within their own domestic context and have sought to move to reform e-commerce logistics more radically. In this section, the terminology of "Cross-border e-commerce" (CBEC) describes the very specific form of e-commerce regulation that is beginning to emerge in China. This is linked to a set of legislation enacted between 2015 and present. This legislation looks to redefine and guide cross-border e-commerce and relates to several parallel activities outlined below (based on interviews and additional from Hongfei 2017, KPMG 2019, SCEA 2019, Yi 2017).

*Import tax reform in China on e-commerce:* The initial focus of cross-border e-commerce in China relates to e-commerce imports. China like other countries has seen increasing demand for e-commerce imports. This includes consumer demand for Western goods through international platforms in some areas. In some cases (such as health scares on baby milk products bought online) consumers have also become wary of domestic goods. There are also more complex activities around informal 'Daigou' importers of goods into the market.

China, therefore, has faced pressure to regulate cross-border imports (that resemble the earlier critiques). E-commerce imports at scale are a risk, in terms of reducing demand for high-quality goods from its own domestic firms. Imports through small parcels may also avoid domestic rules and regulations, and so reform would seek to take back control. Although less explicitly stated in documents, interviewees are well aware that reform can also be used to impact the behaviour of foreign platformized sellers who sell through mainstream Chinese e-commerce platforms.

Tax rules (referred to as the "New Deal") have been introduced that change how imports of e-commerce goods are dealt with. They are important because they established a fundamentally new regime for cross-border e-commerce goods (sometimes referred to by its customs codes – 9610 cross-border e-commerce and 1210 bonded e-commerce as outlined below). CBEC rules then define a new form of trade that specifically relates to trade

connected to e-commerce. It is therefore separate from general trade (with specific goods and tariffs), on one hand, and replaces the movement of goods through cross-border small package trade on the other.

In contrast to global deregulated logistics regimes, China's CBEC policy looks to actively shape cross-border e-commerce through the ways that it is taxed in relation to general trade. Initially, CBEC rules targeted issues around imports to China linked to the so-called "408 policy" reforms in 2016, a Chinese "de minimis"-style rule that determines taxation rules on parcel goods. Previously, parcel goods into China were a relative "free for all" in terms of goods permitted and their inspection.

The new rules provide a limited schedule of goods for CBEC imports, with a limited "positive list" of product codes of which product categories can be imported (around 1300 in 2019). This notably contrasts with general trade in China which in recent years has moved to the WTO norms of a "negative list", where only a limited set of items are subject to stricter rules and regulations on import. In addition to these new forms of tariff schedules, new rules strengthen customs clearance such as quarantine and inspection for e-commerce, although this was delayed as part of the original rules introduced in 2017 due to feedback from firms (these were said to be in implementation in 2019, although it is unclear at the time of writing the current state of implementation).

This new approach is still in its infancy so the overall impact is less clear. The goal is that through careful adjustments of tax bands and product categories, the government can ensure that e-commerce logistics does not offer tax advantages over general trade or imports cannibalise domestic producers. At the same time, planning can allow the controlled growth of cross-border e-commerce in certain areas. For example, part of China's 'going out' is to seek resources and services where they do not have internal resources (e.g. certain types of food imports).

*E-commerce/digital free trade zones (DFTZ):* China has embarked on expansion of free-trade zones to accompany the above policy changes, with a new type of category of zone called an "e-commerce free-trade zone". Two types of zone are in operation, the "Online shopping bonded city" (centred on tax-free shopping in some locations such as Hainan) and the "E-commerce comprehensive pilot areas" (processing zones around e-commerce). The latter is most crucial to cross-border e-commerce. E-commerce comprehensive pilot areas have grown from a single experimental zone in Hangzhou (the home of Alibaba) in 2015 to 35 zones throughout the country in 2019 (Hongfei 2017).

These zones (often located close to other free trade zones as part of broader Chinese strategies) guide importers toward bulk importing in e-commerce rather than using small packages. They provide a centralised point where firms and states interact on CBEC. Crucially they are intended to allow officials to more comprehensively monitor goods as well as undertake inspection regimes and paperwork linked to CBEC rules. Being free-trade zones is essential in that it allows for a balance of liberalisation and regulation in e-commerce logistics. Described as "first line liberalization and second line safe and efficient management", the DFTZ allows rapid imports without checks into bonded warehouses. Relevant checks are then done while goods are in-situ in the DFTZ (IDE-JETRO & SASS 2015,

Yuliang & Yu 2017). Typically during this development stage, specific e-commerce zones have been focussed on trade with specific regions. For example, the zone in Guangzi focussed on cooperation with Vietnam, Hangzhou with Malaysia, and Xinjiang with East Asia (Han & Yang 2017, Hongfei 2017).

In sum, a principle underlying these CBEC forms of logistics is the reduction in uncontrolled small parcel delivery. Rather in DFTZs, imported goods would be imported in bulk to warehouses. Clearance, checks and customs can be applied by public actors with goods then moving into domestic delivery. Bonded warehouses and DFTZ also provide a location to centralise various digital systems and services to improve the efficiency of cross-border e-commerce including import/export services, logistics, credit and market intelligence. The core systems are so-called "single window" systems, which provide all the various steps for importing and customs declarations in a single system for firms. DFTZs throughout China have looked to implement single-window software and they are increasingly integrating with other regional or national administrative systems to allow more seamless flows of goods, declarations, tax returns and data (Wie 2018). Finally, and as a result of the above activity, DFTZs are envisioned to provide agglomeration benefits, through more closely integrating a wider range of services: logistics, finance and services within these areas. Indeed, projects around DFTZs have included promoting technology parks and other hi-tech services related to e-commerce.

*Expanding CBEC into exporting:* The overt focus of CBEC rules (within documentation and interviews) of these new models has been on managing e-commerce imports. However, they are also significant to exports, albeit that changes are happening more gradually and with less information in the public domain. Core to export is the idea that in China, CBEC models centralise the middle-mile of logistics and infrastructure such as DFTZs, bonded warehouses and single window systems.

If a number of similar zones are located internationally, then Chinese e-commerce sellers can bulk ship goods across borders between free-trade zones. Goods are then stored in duty-free warehouses within different free-trade zones so that taxes and tariffs are not implemented until a customer orders a good. When a customer orders a good, they are then released from the warehouse and rapidly dispatched as personal packages as outlined in **Figure 4**.

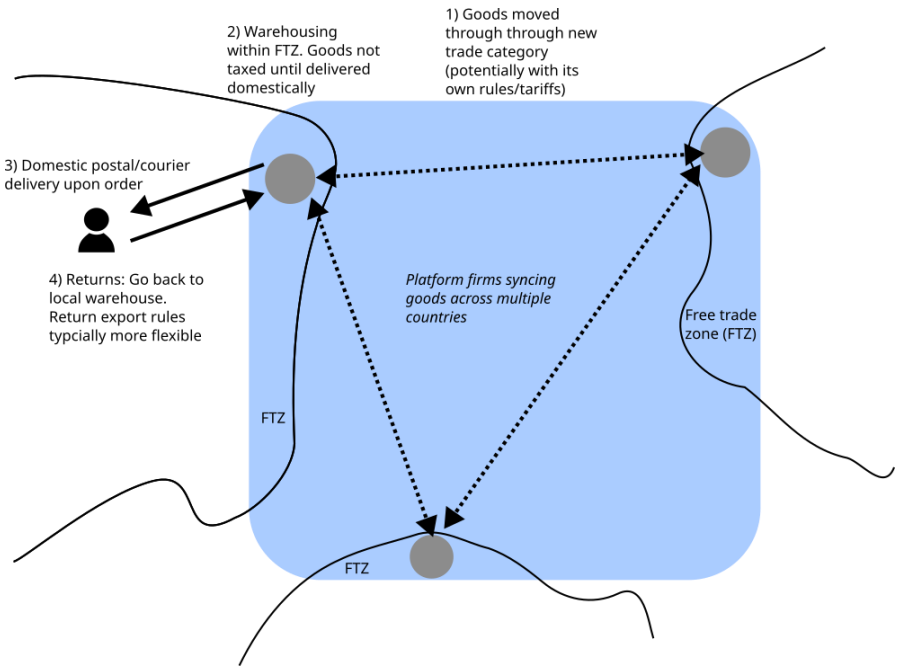


**Figure 4: Envisioned cross-border e-commerce model. Source: Author's construct**

This mode of logistics infrastructure through free-trade zones is well suited to regional e-commerce across regions, as outlined in a description of the operation of the Qianhai DFTZ within Guandong,

> *"..goods exported from Qianhai can be imported into a foreign FTZ and stored under bonded conditions; if purchased, the goods can be conveyed from the FTZ to a foreign market upon customs clearance; in other cases, the goods can be shipped to a third country or returned to Qianhai without any duty payment" (Wu & Ireland n.d.).*

The idea is to replace the complex and fragmented form of small package delivery of goods towards a manageable bonded warehouse model. This mode of logistics infrastructure through free-trade zones is well suited to regional e-commerce. It allows platforms and sellers to better coordinate goods through aggregating them while FTZs. Bonded warehouses reduce some of the penalties that come with general trade around tax and tariffs.

To summarise, these steps in China potentially represent a significant and distinct regime of e-commerce logistics. The impact of these new rules, some of which were introduced recently, delayed or only in partial implementation is still in flux. In the next section, we particularly focus on the political economy of their introduction within Southeast Asia.

# D. Logistics tensions in Southeast Asia

## D1. China 'going out' with CBEC

While Chinese CBEC models were initially centred around domestic reform in China, their expansion and normalisation outside China's borders have been supported by a number of actions. In this section, we highlight active interventions involving South Asian neighbours where CBEC moves beyond being solely a technical exercise to incorporate capital investment and political economy.

In terms of e-commerce, the major driver behind pushing Chinese e-commerce regimes within Southeast Asia comes from the way that Chinese e-commerce firms have expanded throughout the region. As part of China's digital expansion, e-commerce companies have been at the forefront mainly through mergers and acquisitions. In 2016, regional e-commerce leader Lazada was acquired by Alibaba in one of the largest acquisitions in the sector at the time. The leading regional competitor to Lazada, Shopee remains controlled by Singapore's SEA but Tencent acquired a 20% stake in 2017. Other e-commerce firms have also been active with JD acquiring several local firms in Indonesia, Thailand and Vietnam to launch overseas platform operations[3].

Alongside this, a range of other Chinese firms in the e-commerce ecosystem (and associate Chinese venture capital) have been active in Southeast Asia. Some such as Alibaba's logistic arm Cainiao have become more involved in the regional movement of goods, particularly through investments in foreign warehouses in seven countries (eCommerceIQ 2016). Local firms in areas such as payments, last mile logistics and bricks-and-mortar retail firms have been acquired or become involved in substantial partnerships with Chinese suppliers. Alibaba as the largest e-commerce firm has been the largest mover taking control or buying stakes in firms such as Ascend Money (Thailand), Mynt, HelloPay (Philippines), Emtak (Indonesia), and Touch 'n Go (Malaysia). As outlined in the case of Thailand below, partnering firms will fall into line with Chinese norms, in effect supporting Chinese CBEC models abroad to link into trade to and from China. Therefore, as e-commerce leaders become more concentrated in Southeast Asia, the logistics strategies of leading platforms and ecosystem firms become the defacto rules within countries of Southeast Asia.

At a wider level, the emergence of Chinese logistic regimes in Southeast Asia has been supported through large-scale investment in infrastructure around the Belt and Road. For example, through the Belt-and-Road, China has supported the creation of overseas processing zones for Chinese trade (often as free-trade zones) and supported this through infrastructure investments, soft loans and other incentives (Huang 2016). These sites are the foreign sites of logistics for e-commerce with additional investments through "Digital Silk Road" projects (Shen 2018). Two types of investment have been particularly important for CBEC: data infrastructure on logistics and logistics processing.

In terms of data infrastructure, as mentioned, e-commerce free trade zones in China have become a site for systems and services for e-commerce trade, particularly through integrated single windows. Overseas zones in Southeast Asia then become integrated with these systems and as sites of services, goods processing and a number of pilot projects. One example of this is the China-ASEAN information harbour project which has been connected to the Digital Silk Road project. This notably includes the creation of an international clearance platform where ASEAN single windows can be integrated with Chinese domestic single windows. This would allow firms with Southeast Asian processing zones to be able to more carefully coordinate their CBEC trade with China.

[3] At the time of writing in 2023, JD stepped back from these partnerships as regional competition has become more fierce. In line with the discussion of this paper, they have now stated their goal is to more strongly focus on logistics both domestically and internationally.

Alongside data infrastructure, Chinese investment has come in logistics facilities. The flagship example of this has been the support of the Digital Free Trade Zone in Malaysia. Driven by a reported $100m investment from Alibaba's logistics arm Cainiao, it has sought to invest in high-tech logistics hubs as part of a broad set of developments (Yean & Yi 2019). On a smaller scale, China has been one of the most active countries in the region in investment in foreign warehouses with the goal to provide improved capacity for China platformized sellers (Jiao 2016). For firms involved in e-commerce, these trajectories are likely to lead to simpler services built on top of this Chinese logistics infrastructure. For example, such integrations enable simple logistics platforms such as Alibaba's "One-touch" which allows platformized firms to integrate various steps of import/export within a single system.

To support such investment and integration, China has also been active in pushing e-commerce cooperation mechanisms and MoUs, as part of the so-called "Silk Road e-commerce partnership". Currently, 29 of these have been signed including in the Philippines, Laos, Thailand, Singapore, Cambodia and Vietnam[4]. Although the specific texts are not available publicly, reporting suggests these relate to soft commitments to cooperate in areas such as logistics, payments and platforms, potentially moving towards stronger agreements in the future. Some Chinese links have been more strategic including Malaysia as part of the large-scale investments outlined above. Here cooperation is more substantial and includes broader investments, ecosystems support and/or specific systems/data sharing to support integrations.

Investments and agreements between countries have also been accompanied by set-piece political events. We term them "Alibaba diplomacy" here, as they often centre on Jack Ma interacting with a head of state as a high profile project or agreement (in Russia, Thailand, Rwanda, Italy) with resultant publicity gains to regional leaders keen to emphasise their support for the digital economy.

In sum, such actions and investments are pushing the emergence of Chinese point-to-point regimes in the region, connecting processing zones into domestic DFTZs in China, and pushing bilateral agreements around e-commerce and shaping logistics in the process. These represent the more "point-to-point" style activities[5] linked to establishing CBEC models outside China.

[4] https://dzswgf.mofcom.gov.cn/slds.html

[5] There have been some less successful attempts by China to establish point-to-point CBEC models more multilaterally. One attempt has come in the electronic World Trade Platform (eWTP) led by Alibaba (B20 2016). The eWTP is a private sector initiative that specifically identifies the challenges that SMEs face within cross-border trade such as those mentioned in this paper. Although what the eWTP actually is, is ill-defined, signatories might commit to certain rules (de minimis levels, standards, harmonization of tax) to support cross-border e-commerce trade flows mirroring Chinese models. Although key actors have been at pains to position the eWTP as an open, multilateral protocol, actions have so far remained more aligned to Chinese point-to-point e-commerce regimes.

China has also looked to other multilateral mechanism by which Chinese CBEC schemes would become more universal. In the World Customs Organisation it was influential in the "Framework of Standards on Cross-Border E-Commerce". China also joined the recent WTO Joint Statement Initiative on e-commerce. Draft annotations indicate that China has sought to promote clauses around CBEC in the negotiations, although it would be surprising if these were included in the final agreement (Foster 2021).

## D2. The case of Thailand

Thailand has been active in looking to support global regimes for e-commerce trade through rules-based frameworks both at a regional and global level. It is a signatory in the broader APEC (Asia-Pacific Economic Cooperation) Masterplans, ASEAN (Association of Southeast Asian Nations) e-commerce frameworks and the RCEP (Regional Comprehensive Economic Partnership) e-commerce chapter, all of which support soft commitments and improved coordination in e-commerce (Wongwuttiwat & Lawanna 2018). Thailand has also notably been one of the more active Asian (and emerging) countries involved in WTO processes around e-commerce. This includes the implementation of the WTO Trade Facilitation Agreement leading to the development of single window systems.

Such activity puts pressure on Thailand to move towards deregulating small package trade. Currently, the de minimis level in Thailand is set at 1500Baht ($48), and applies only to air freight. This is relatively low compared to some neighbours (e.g. Malaysia $127, Philippines $192) and much less than countries such as Aus ($781) that are leading the push for deregulation of e-commerce logistics, "… Thailand needs to reconsider the de minimis criteria to be appropriate for the situation and the growth trend of cross-border e-commerce" (ETDA n.d. p.165). There has also been external pressure on the government in terms of reforming such rules to align (or go beyond) other nations.

Several initiatives move from this into broader national trade platforms that link a broader set of actors, platforms and ecosystems which are still in progress. There is an aspiration on linking such development to the regional ASEAN single window system, and other more experimental integrations on e-commerce, although these are still at a nascent stage (TNSC 2018). Thailand has also been active in the plurilateral Joint Statement Initiative on E-commerce currently in negotiation. Although such initiatives are beginning to support coordination on logistics norms by the development of binding rules frameworks for e-commerce, they have been characterised by slow negotiations. Typically the direction of such negotiations may be more closely aligned with the global deregulated logistics regimes described earlier. They look to support capacity building and clarity around how packages move across borders.

In contrast to the slow pace of small package logistics deregulation, the strengthening of Chinese control of platforms and e-commerce firms in Thailand is stark. This includes the growing power of the two leading marketplace platforms (Lazada owned by Alibaba, and Shopee where Tencent has a significant stake discussed above). Chinese platform firms have had a specific dynamic. They explicitly seek to tie platforms more closely to China. One can see this most vividly in action in terms of the evolution of the Lazada platform after its takeover by Alibaba. The changes and strategies in recent years focus on a close integration of Chinese sellers, goods and incorporation of technologies into the platform with inevitable impacts.

In terms of logistics, changing platform control has been accompanied by bilateral agreements with China. Thailand signed a number of high-profile MoUs with China touching

In sum, although we can say there have been attempts to push Chinese point-to-point e-commerce regimes multilaterally they face challenges and opposition, particularly as the coalition around globally deregulated logistics regimes is pushing in other directions.

on a range of e-commerce issues. This MoU was notable for logistics because it was accompanied by financial support to build a joint Thai-Chinese e-commerce logistics hub in Chachongsao ($320m) (close to Bangkok). This is intended as a high-tech facility to speed up cross-border logistics. For Thailand, this agreement supports and finances one of the core political objectives of becoming a regional logistic hub through its Eastern Economic Corridor (EEC) plan (Ariyapruchya et al. 2017). This deal then also supports Thailand in potentially becoming a regional e-commerce logistics hub. The logistics zone and hub would be located in a DFTZ with 8 years of income tax waived on firms (and 50% from years 8-12).

The digital trade zone would act as a free trade zone through the use of "e-lock" technology, allowing processing, finishing and warehousing in the zone without tax, in line with Chinese e-commerce point-to-point strategies. Although less successful, such investments and negotiations have been accompanied by pressure for Thailand to reduce non-tariff barriers for goods moving into the new logistics zones, aiding Chinese imports. Alibaba has also (so far unsuccessfully) pushed for Alipay to become a Bank of Thailand-approved payment provider to allow broader incorporation of financial services into platforms (prachachat.net 2018).

Interestingly, the public discussions and set-pieces accompanying the MoU and investment occurred with e-commerce firm Alibaba at the forefront, with associated investments made by Alibaba's logistic arm Cainiao. Agreements were cemented by a set piece unveiling by Jack Ma alongside Chinese officials. Ma, acting as a quasi Chinese government representative unveiled the agreements selling benefits alongside former Prime Minister Chan-o-cha. Policy respondents in Thailand suggest that the scope of this policy is essentially a China-Thailand agreement. Although not formally branded within the eWTP project, many of the features resemble other eWTP agreements such as in neighbouring Malaysia.

Such actions driven by the Chinese government and its firms should not be seen as solely about Chinese power. As well as supporting economic objectives around the EEC project, upgrading infrastructure and cross-border logistics can be beneficial to domestic and small firms in Thailand. This has been positioned as supporting productive capacity and facilitating exports of Thai goods. As Deputy Prime Minister Somkit has emphasised

> "[we can leverage Chinese] knowledge to help empower rural villages in impoverished rural areas. Let them be able to sell online, develop products and services and take out the original product…So I say that the Thai government really needs these things. Most of the Thai people are poor farmers. Every year, products come out in excess of the market. They don't know where to go to sell. But if there is a global market to support these will help farmers immensely, earn more have a better life*" (Krasae 2018)*

As part of the MoU, three agreements were signed to support Thai firms' cross-border activity (capacity building, tourism, rural digital initiatives) that might also include broader development and inclusion goals around e-commerce.

# E. Conclusions

The analysis of e-commerce and logistics highlights several major points. We argue that e-commerce logistics is fundamentally shaping the types of business models available to e-commerce platforms. The common idea of segmented national markets in e-commerce has led to a focus on last-mile logistics in regions such as the EU and US. In Southeast Asia[6], the primacy of cross-border e-commerce and small package delivery suggests that it will be the middle-mile (distribution of goods across regions) logistics that will shape core business models.

Returning to the notions of infrastructure, below we summarise the two different accounts of infrastructure and link them to e-commerce and logistics. First, a more technical discussion has revealed how underlying logistics rules and regulations are orientating e-commerce. Second, we highlight how these types of models are being plugged into tensions around infrastructure-led development models.

## E1. Logistics regimes

At present, e-commerce is dominated by cross-border small package trade leading to a grey area in logistics rules and regulations, the slow movement of goods and many challenges and risks. This has implications for platformized sellers in Southeast Asia: it may lead towards foreign firms shipping low-cost goods in the region. Domestic producers can face systematic barriers, particularly smaller ones to exporting through e-commerce. More broadly, these limits to logistics suggest limits to e-commerce in smaller markets.
Two options have been suggested to overcome this. On one hand, deregulated logistics regimes look to push countries to upgrade and improve their small package logistics and regulation. The long-term goal here would be the relatively free-flowing movement of such goods, driven by global third-party logistics and minimal tariffs and checks. While there has been much discussion of these in global forums and some implementation, progress has been relatively slow with dominant regional marketplace platforms skewed towards low-cost Chinese sellers.

In this sense, initiatives around Chinese cross-border e-commerce reforms are welcome. They provide an approach by which countries such as Thailand might in the future be able to more granularly control logistics goods across borders. The forms of CBEC rules in China appear to offer more lightweight first- and middle-mile organisation of logistics that can be a long-term benefit for platforms and platformized firms. Rules and regulations provide clarity around this area in terms of tax, regulation, customs and so on and provide stability for operators in what was previously an area with unclear rules. For governments, they offer broader trade policy and industrial policy levers for the future. An important part of these policies is to centralise the spaces where these rules are monitored and enforced, principally within free-trade zones and their surroundings.

[6] Although requiring further research, this appears to have parallels within other regions of the global south.

## E2. Infrastructure-led development

The Chinese goal has been to reform and align e-commerce with broader economic goals of "going out" and innovation through the creation of a new type of e-commerce across borders particularly within the idea of "cross-border e-commerce" reform. This can be with significant actions connected to Belt-and-Road projects and partnership cooperations with several countries related to the BRI. While these agreements may lead to more substantial collaboration in the future, they are non-binding and in their early stages. For the region, this suggests a likely future "bilateral" structure for e-commerce logistics, centred on large cities in China linked into major points within the region which are closely coupled with China through ports, agreements, domestic rules and broader political alignment.

While this model has advantages, these regimes are one-way and China-orientated in their present form. Therefore one of the big challenges is the suspicion that the end goal is simply facilitating Chinese firms to sell more efficiently in the region. A few entrepreneurial firms in Thailand may gain but in aggregate, these links may further decimate domestic production. It is too early to tell if this will be the impact of activities within Thailand. However, in her analysis of the more developed projects in Malaysia, Yean provided a sceptical view of gains (Yean 2018, Yean & Yi 2019). The Chinese point-to-point logistics offers hope for domestics SMEs, but overall, "the DFTZ…favours imports over exports. This increases competitive threats to local SMEs, which are already facing declining comparative advantages vis-a-vis China, especially in consumer goods" (Yean 2018 p.5)

The question then is if countries such as Thailand can leverage these investments and capture value to push their development (Foster 2023). As part of their MoU with Thailand, Alibaba has emphasised important agreements and demonstrators of value for Thailand, such as goods and services where small firms will benefit as exporters. These can continue to be developed alongside careful monitoring of trade flows. Such e-commerce agreements and cooperation are delicate and maintaining mutual benefits will be important to ensure that countries do not begin to put barriers in place to prevent flows.

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