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Fostering cross-border twin cities as instruments for sustainable development

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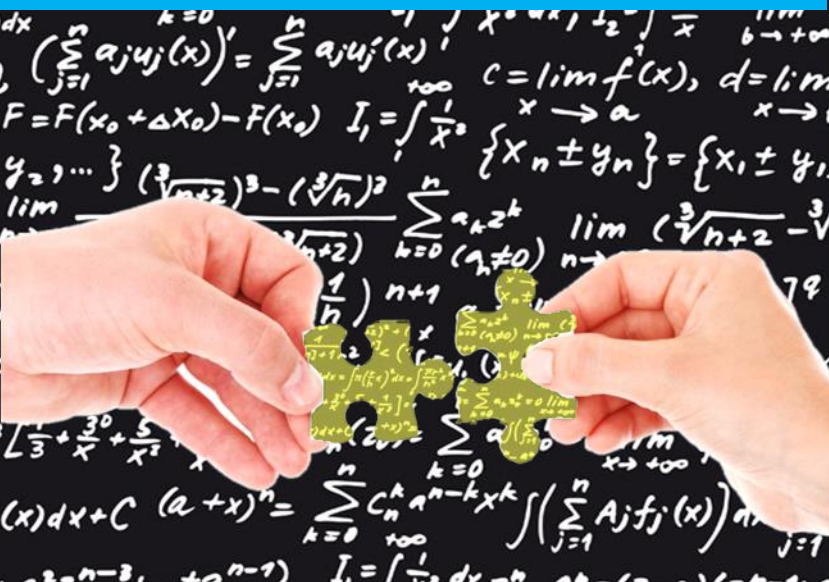
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Fostering cross-border
twin cities as
instruments for
sustainable development



Hubert Massoni
Masato Abe

ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

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ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

WORKING PAPER

Fostering cross-border twin cities as instruments for sustainable development

Hubert Massoni and Masato Abe[†]

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Abstract

Looking closely at borders in South-East Asia reveals the existence of adjacent townships of different nations that develop across the border with varying degrees of parallelism. Such cross-border twin cities act as production, trade, logistics and border nodes, shaping cross-border value chains and concentrating economic activities, industries, resources, labour forces, knowledge and infrastructure in geographical spaces connected by multimodal transport networks. Literature assessing the development of cross-border twin cities generally reveals cross-cutting socioeconomic benefits for the border zones, indicating strong potential for sustainable and inclusive development. This study hence attempts to build a theoretical framework of cross-border twin cities. Cross-border twin cities are defined as two urban centres that: (i) are closely located across an international border; (ii) are accessible through transport and information networks and urban amenities; (iii) are subject to the structural reconfiguration of the border economies, economies of scales and a common integration into cross-border value chains; (iv) facilitate the development of complementary industries through key policies shaping industries and promoting trade and investment; and (v) collaborate at several levels in policies and projects. Both hardware dimensions and software dimensions are considered to capture the complexity and the various policy implications of the phenomena. Three case studies of existing cities located across the Thai-Myanmar and Thai-Lao PDR borders additionally validate and verify the consistency of the framework with people's first-hand experience and real-life situations. Qualitative studies based on academic, governmental and corporate literature reveal the existence of cross-border twin cities along the Thai-neighbour borders. Although multimodal transport and logistics networks and attractive economic policies effectively have increased trade and industrial activities, urban infrastructure and cooperation between neighbouring cities generally remain insufficient to tap the full potential of these cross-border twin cities. Before concluding, the study derives policy recommendations for the practical policy framework fostering cross-border twin cities in South-East Asia.

Keywords: Twin cities; cross-border development; Lao PDR; Myanmar; Thailand

JEL Codes: O1, R11

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1. Introduction

During the past decades, production and supply activities have increased along the international borders of Thailand and its neighbouring countries such as Lao PDR and Myanmar. Those cross-border activities include trade of goods and services, flow of capital and movement of labour, which function within the networks of infrastructures and institutions (Brunner, 2013). The development of cross-border activities and networks also reinvigorates the growth of the local business community and promotes its linkages with international markets – especially through increased flows of foreign direct investment (FDI), product and service development, skill enhancement, technology transfer and more access to credit (Singh, 2016).

From a bird's eye view over the borders of Thailand with its neighbouring countries, cross-border production and supply networks reveal the important points of activities or functions, often referred to as nodes or hubs that conduct cross-border trade, production and logistics. The different types of nodes and hubs have been identified including: commercial nodes (cities or large towns), border nodes (customs and immigrations), gateway hubs (access points to external markets), interchange hubs (logistical centres) and corridor towns (major commercial nodes along economic corridors¹) (ADB, 2014). The nodes and hubs play the crucial role of concentrating economic actors, industries, resources, labour forces, knowledge and infrastructure in geographical spaces that are linked through along multimodal transport networks (ibid.).

The examination of the nodes and hubs across Thai borders reveals the existence of *cross-border twin cities*², adjacent townships of different nations that develop with varying degrees of parallelism, often sprouting up across rivers and linked by international bridges. Twin cities are urban centres and gateways for enhanced cross-border trade, investment and economic interdependence, closely located across an international border, connected through a comprehensive transport network. They are made possible in part by their existence in a flexible economic space, a potting soil for potential sustainable development across two nations (Anuar, Mustafa, & Farhat, 2014). Twin cities' institutional bodies implement trade facilitation and investment attraction policies and collaborate administratively with common projects and social

¹ An economic corridor is defined as a designated geographical area with integrated and complex networks of infrastructure, logistics and economic and social interactions that link commercial and production activities, urban clusters and market gateways (ADB, 2014).

² For the sake of brevity, twin cities are used interchangeably with cross-border twin cities throughout the paper.

systems to foster mutual socio-economic growth and urban development across the borders. This space, if intentionally shaped through development mechanisms such as special economic zones (SEZs) or cross-border transport infrastructures, also ensures these cities' positions as important commercial and/or border nodes. Although the concept of city-twinning has been recently explored using a transdisciplinary approach at the economic, sociological and anthropological fields, it is yet to be fully framed and defined as a distinct phenomenon (Anuar, Mustafa, & Farhat, 2014; Franck, 2014).

The twinning metaphor does not find a consensus among scholars, as it may suggest perfect parallelism between the urban centres and in their development. No clear legal or cultural definition of city twinning exists either (Clarke, 2009). Other appellations – often with a vaguer meaning – are sometimes preferred, such as companion or neighbouring cities (Buursink, 2001). However, in this study, the twin term is used to reflect the possible convergence and policy goal associated with such phenomenon. The following analysis referring to cross-border twin cities should hence be understood as dynamic and giving space to policy action, instead of as a static photography of cross-border developments.

The potential of twin cities for sustainable development constitutes a strong stance of this article. One can foresee direct impact of emerging cross-border twin cities on at least four Sustainable Development Goals (SDGs) pillars: decent work and economic growth (pillar 8), industry, innovation and infrastructure (pillar 9), sustainable cities and communities (pillar 11) and partnership for the goals (pillar 17)³. Although the implications of twin cities phenomena on SGDs will not be discussed in details – i.e. the article will not provide with a systematic match-making between twin cities characteristics and SGDs targets and indicators – authors ultimately wish to promote twin cities as a tool to foster inclusive and sustainable development within the region.

Against this backdrop, this article aims to frame cross-border twin cities conceptually. This allows for evaluation of the twin cities phenomena's impact on sustainable development, notably on the economic and social dimensions. It also examines the development of twin cities through

³ Sustainable development as defined by the United Nations include 17 pillars to be implemented and achieved by every country by 2030, covering the three historical dimensions of sustainability, i.e. the economy, society and the environment. SDGS are declined in several targets and indicators with clear implications for policymaking. Pillar 8 refers to the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Pillar 9 refers to building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation. Pillar 11 refers to making cities and settlement inclusive, safe, resilient and sustainable. Pillar 17 refers to strengthening the means of implementation and revitalizing the global partnership for sustainable development (United Nations, 2019).

case studies along the borders of Thailand and provides policy recommendations to foster the phenomenon as a model for cross-border development. The case studies can illustrate not only the geographic and physical characteristics of select twin cities but also the policy initiatives or administrative actions taken by policymakers and stakeholders.

After this introduction, the second section reviews the development of twin cities and provides a conceptual definition of the phenomenon, echoing the existing literature but proposing a comprehensive and generalized framework. The third section validates the twin cities model, by applying it to three case studies that have arisen along the Thai borders. Following these analyses, the fourth section provides the policymakers and stakeholders with a set of assessment tools and policy recommendations for further development of twin cities. The final section concludes with an overview of this paper's insights.

2. Defining cross-border twin cities: a conceptual framework

This section reviews the literature of twin cities or equivalent concepts such as the hubs and nodes of economic corridors. In addition, it clarifies the underlying issues, including its common definition of twin cities, and proposes a conceptual framework. This conceptual framework may further be used by policymakers, practitioners and scholars assessing the twin cities phenomenon and may assist in the implementation of policies in order to foster cross-border development with enhanced trade and investment.

2.1 Literature review on cross-border twin cities

Scholars have so far used a multidisciplinary approach to assess the twin cities phenomenon, integrating insights from several fields in attempts to comprehensively frame the concept. Buursink (2001) proposed a review of terms used by scholars to investigate twin cities in various fields, such as economics, geography, history, sociology, anthropology and ecology. More recent examples of terms are presented in Table 1. Most of the recent studies evoke twin cities through transnational border trade and investment, but also through city planning and re-composition of urban areas, providing crucial characteristics and insights on actual practices. This section goes through the studies which provided the main insights to frame this paper's focuses.

Table 1. Naming cross-border urban phenomena

Study	Term	Definition	Country/ zone	Scientific field
Ehlers, Buursink and Boekema (2001)	Border cities, twin cities	Gateways for the entry of goods and people, growing on the back of transit and storage activities, as well as the customs regulations applied in them. The border activities often bring about a duplication of urbanization, thereby giving rise to twin cities.	Europe and North America	Borderland studies, economic geography
Zelinsky (1991)	Sister cities	Formal long-distance twinning of cities, often based on historical connections, shared economic, cultural, recreational, and ideological concerns, similar or identical place names.	World	Geography, history
Nugent (2012)	Border towns and cities	Smaller urban settlements as well as very large conurbations located on either side of an international border, often across rivers and lakes or at either side of mountain passes. Income inequalities, migrations, cross-border shopping or selective use of social amenities may be part of the phenomena.	North America, Europe, Africa	Borderland studies, urban anthropology
Lapidus (1969)	Double cities, twin cities	Formed by adjacent settlements units separated by rivers, or a fortress and its suburbs developing separately.	Middle-East	Urbanism
Herzog (1991)	International boundary cities, trans-frontier metropolis	Densely populated regions along international borders, sharing ecological resources but also environmental problems.	Western Europe and the US-Mexico border	Natural resources studies
Kehi (2005)	Friendship cities	Long-distance formal relationship between two cities, with mutual promotion of values, local cooperation and cross-cultural exchanges.	Australia and Timor Leste	Political economy, political science
Clark (2009)	Twin towns	A modality of international cooperation at the local level, formalised by twinning agreements, permanence of relationship and recognition by local authorities.	Great-Britain	History, geography

ADB (2014) suggests that border nodes, gateway hubs and interchange hubs play a crucial role developing twin cities and upgrading transport networks to economic corridors. Those nodes and hubs are commercial and logistical centres at the border-crossing serving as catalysts to the development of geographic areas surrounding the economic corridors and access points to external markets (Arnold, 2010). Those nodes and hubs provide important insights to understand the twin cities phenomenon.

Anishenko and Sergunin (2012) assess the emergence of twin cities as a new cross-border cooperation model in the Baltic States, as a result of involvement of municipal units in transnational cooperation, while proposing twin cities as a multidisciplinary concept. The authors

identify twin cities as (i) closely located, (ii) generally across a river border, (iii) sharing a common history – whether rivals or not, (iv) hosting mixed ethnic composition and (v) cooperating on the basis of legal institutions. The study concludes that the twin cities phenomenon fosters regional and cross-border integration among the Baltic States.

Franck (2014) investigates the phenomenon within South-East Asia economic corridors and provides a definition of twin cities as urban counterparts integrated in specific axes of economic, spatial and demographic accumulation between two poles. Twin cities are notably based on (i) geographic proximity, (ii) economic or cultural ties, (iii) transnational cooperation strategies and (iv) trans-boundary urban configurations. Along economic corridors, twin cities facilitate cross-border trade and investment by playing the role of logistic and communication nodes.

Anuar, Mustafa and Farhat (2014) study twin cities as a driver of sustainable growth in Thailand and Malaysia. The study defines twin cities as spatial organization fostered by (i) infrastructure networking, (ii) administrative harmonization, (iii) respective comparative advantages and (iv) socio-economic complementarities, leading to economic dynamism specific to transnational regions. Thus, they present twin cities as a new development strategy to provide counterbalance to the protectionism and to strengthen economic link between two neighbouring countries.

Lainé (2013) also evokes the twin cities phenomenon when assessing the East-West Economic Corridor (EWEC) of the Greater Mekong Subregion (GMS).⁴ Twin cities are (i) two urban centres facing each other, (ii) across an international border, (iii) possibly linked by an institutional agreement, (iv) integrated to international flows of trade, capital and tourism and (vi) influenced by local, national and international stakeholders. Although the study does not suggest a socio-economic resemblance or symmetry between the two cities, it highlights the positive impacts of the twin cities phenomenon on trade, investment and internationalization.

Although scholars from different research fields have examined the characteristics of twin cities, the conceptual framework of twin cities, including their definition, is still weak. This requires developing a concrete framework of the twin cities phenomenon.

⁴ The GMS comprises Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam and the south-west part of China. The East-West Economic Corridor (EWEC) crosses the central regions of four countries, Viet Nam, Lao PDR, Thailand and Myanmar, starting from the Da Nang deep sea port, Viet Nam, and runs through Savannakhet, Lao PDR, and Mukdahan, Pitsuanulok and Mae Sot in Thailand, to Myawaddy and Mawlamyine, Myanmar, before finally reaching Yangon (ESCAP, 2015).

2.2 What are cross-border twin cities?

As seen in the literature, the twin cities phenomenon refers to a complex intertwining of administrative practices, spatial reorganization, dynamic internationalization of production and multilateral stakeholders. To that extent, twin cities are a multidimensional concept. Distinct dimensions are grouped into two subsets of hardware and software dimensions which are inherent to the phenomenon. Hardware dimensions are relating to the physical characteristics of the two cities, while software dimensions are related to the policy, institutional and regulatory environments of the two cities. This section first highlights the necessity of developing a multidimensional concept for twin cities. It then elaborates these dimensions to comprehensively theorize the concept that helps assess cross-border practices and provides policymakers and stakeholders with tools to address the phenomenon.

Preliminary assumptions

A misuse or idiosyncratic use of the concept would threaten the validity of the construct (Cronbach & Meelh, 1955). On the other hand, a well-developed construct would prevent the concept to be misused for future research. In this regard, two crucial assumptions are highlighted to develop a construct of the twin cities phenomenon.

First, the twin cities phenomenon is the outcome of a path-dependent process. Each step toward the Twin Cities concept is dependent of the previous states. In other words, each improvement in any of the concept's dimensions is cumulative and will favour improvements in following steps and other dimensions. Further, any event has a disproportionate effect on the final outcome. Thus, each process is different and does not necessarily converge towards a unique state following a similar path.

Second, and consequently to the first assumption, the twin cities concept is not perfectly observable in the field. It is rather a potential construct, used as an ideal measure (or an ultimate policy indicator) to assess cross-border development processes. Hence, different potential states are achievable, depending on the starting points and the level of development of each of the dimensions underlying the concept.

Hardware dimensions

The hardware dimensions are the first set of key components defining the *physical* aspect of the twin cities phenomenon. The dimensions include geographic, socio-economic or physical components (such as location, infrastructure, endowment or networks). This study highlights three

hardware dimensions, as follows: (i) cross-border proximity, (ii) cross-border connectivity, and (iii) economic interdependence.

Dimension I: Proximity

The proximity dimension plays the first key role in the twin cities concept. The two urban centers are closely located and share an international border (land, river or strait border). The proximity criterion implies that the two urban centers are close enough not to deter any economic agent from migrating to the other town. Therefore, the daily migration of workers seeking to work on the other side of the border is a convenient parameter to define the maximum distance in between twin cities. Shirai, et al. (2017), after investigating the relation between residential location and employment site as well as commuting distance to the place of work in North-eastern Thailand, suggest that a threshold distance beyond which workers are unlikely to travel for commuting is between 10-20 kilo meters that is to say for a travel time of roughly 30 minutes by vehicle including border crossing. This implies that twin cities are typically located each other within a radius of less than 20 kilo meters. It is also important to distinguish such geographic proximity concept of twin cities from other terminology used such as “sister cities” or “pair cities,” which are not located closely each other. Twin cities’ geographic proximity is moreover a crucial factor leading to economic interdependence between the two urban centers.

Dimension II: Connectivity

Twin cities are characterized by an improved connectivity between two urban centres. The connectivity dimension is consequently divided into three sub-dimensions, all related and necessary for optimal flows of goods and human resources between the two cities: (i) transport network; (ii) cross-border migration; and (iii) urban infrastructure.

Transport network is the backbone of the twin cities phenomenon. It is an efficient and well-developed transportation system which opens up to new markets and enhances the economic potential of agents currently not participating or struggling to participate in the markets. The volume of trade between two urban centres is likely fostered by optimal investment in transport infrastructure (Bougheasa, Demetriades, & Morgenrothc, 1999). More typically in the case of twin cities, the building of bridges, roads, urban bypasses, seaports, airports, river piers or warehouses is an essential factor to internationalize local economies (Franck, 2014). Dry ports, which are located in an inland area, also provide facilities and services such as customs clearance

and temporary storage and connect to one or more modes of transport such as surface trucking, air freights, and ocean shipments (ESCAP, 2012). This sub-dimension drives the role that twin cities play as nodes or hubs integrated in economic corridors and reducing poverty at both sides of the border (Brunner, 2013; Warr, Menon, & Yusuf, 2010). Information and communication technologies (ICTs) particularly create a positive impact on transport infrastructure facilitating international trades of goods and services through the decrease of transaction costs.

Twin cities also promote co-development and mutual complementarity of labour forces by jointly managing cross border migration. Free movement of people is crucial in balancing lacks and surpluses of labour in different industries at both sides of the border and provides significant development dividends to local communities (Hugo, 2009; Ivakhnyuk, 2006). Twin cities facilitate migration of labour across the border through bilateral agreements, while providing appropriate social services and labour rights protection. Cross-border migration impacts positively both sides of the border, irrespective of the economic status of migrants, both in fostering socio-economic development and in complementing the needs for labour forces in twin cities (Wickramasekera, 2002).

Twin cities also benefit from well-designed urban infrastructure that facilitates migrations and commercial activities. Urban amenities particularly enhance local development by providing adequate infrastructure to attract industries and labour forces into local economy (Gottlieb, 1994). Amenities notably include recreational, sanitary and health infrastructures. A particular effort must be made towards the development of quality education systems, providing vocational and higher education and professional trainings, in order to develop managers and skilled workers (Ivakhnyuk, 2006).

All in all, twin cities' connectivity relies on a well-developed network of infrastructure that enhances mutual development. Goods and people together with capital move easily across the international border separating the two cities, and adequate urban infrastructures are fuelling the intensity of trade and migration.

Dimension III: Interdependence

Due to the proximity and increased connectivity of two urban centres, twin cities are subject to economic interdependence. In other words, twin cities' economies are integrated, complementary and co-developed, benefiting from key drivers of regional growth: structural transformation of border economies, shared infrastructure and active participation in cross-border value chains.

Along the borders, twin cities experience a structural transformation of their economies to enhance productivity through the cross-border agglomeration of resources and labour forces (Brunner, 2016). Driven by competition in open economy, the agglomeration of resources and the resulting spatial division of labour occurring around border-crossings increase return to scale and productivity, due to growing sectoral heterogeneity and manufacturing activities (ibid.). As exporters and producers tend to operate in clusters (notably attracted and developed by conducive business environment and appropriate policies), they can also enjoy spill-over effects such as lower transaction cost and the transfer of information, knowledge and technology.

The shared infrastructures of twin cities accelerate such structural transformation, while saving cost especially in transportation that is of crucial importance for cross-border trade (Aseff, Espejo, & Morales, 1997). In practice, twin cities with different infrastructure endowments can share the use of electricity, telecommunications, water supply, ports and airports provided by the most endowed neighbour to its urban counterpart and save a large amount of costs (Kudo, 2009).

The interdependence of twin cities is also characterized by the development of cross-border value chains, reflected by growing collaboration among traders and producers with value-added trade and FDI. Local firms' participation in cross-border value chains makes them to be internationally competitive and create values, as the firms become suppliers to large firms and benefit from operating within international production networks. They can then conduct larger-scale exports and move up to the higher value-added functions of international production networks, while creating jobs and generating incomes (ESCAP, 2007).

Software dimensions

The software dimensions are the second set of key components describing the administrative or political aspect of the twin cities phenomenon. These sub-dimensions define the cooperation and mutual actions of twin cities' institutions and stakeholders. Two software dimensions are inherent to twin cities and added to its concept: (iv) policy-level facilitation; and (v) administrative collaboration.

Dimension IV: Facilitation

Twin cities actively use various policy tools to facilitate economic co-development and local growth across the border. Such intervention from both central and local governments usually takes the form of (i) policies shaping business environment, (ii) policies facilitating trade and investment or (iii) agglomeration policies (such as SEZ and industry cluster development). The

policies and associated regulatory environments are designed to foster local business communities and enhance trade and investment flows between the two urban centres by relieving major business challenges faced by firms, such as bureaucratic red tapes or transport costs.

Comprehensive business regulations and competition policies, designed to develop enabling environment for business communities, enhance the growth of total factor productivity (Brunner, 2016). Recent literature also suggests that innovative firms, including small and medium-sized enterprises (SMEs) and start-ups, should be at the core of regulations and business support policies having recognized their role for job creation and the necessity to diversify their economies (Haltiwanger, Jarmin, & Miranda, 2013; Vivarelli, 2014). A solid policy and regulatory framework, fostering competition and improving the business environment for all firms, is thus a necessary condition for twin cities to ensure proper growth across the border.

Trade and investment agreements, including cross-border transport agreements, are multilateral and multidimensional instruments used by policymakers to facilitate cross-border trade and investment. By reducing transaction costs, trade barriers and restrictions, agreements arguably foster trade and investment volumes between countries (Baier & Bergstrand, 2007; Carrère, 2006). Cross-border transports agreements also cover specifically transport facilitation, harmonize custom regulation and ease cross-border movements of goods and people, with a positive effect on trade volumes (ADB, 2009). Those agreements positively channel investments in concerned zones like twin cities, especially when investment measures are covered in the provisions of the agreements (Leshner & Miroudot, 2006). This latter point is of crucial importance, given that total factor productivity in developing economies is dependent on external knowledge for innovation, notably through FDI and associated technology transfer (Brunner, 2016).

In addition, the implementation of agglomeration policies along the border has a lasting positive impact on business and transportation costs embedded in twin cities' economies. By providing infrastructure (such as transport infrastructure or reliable power supply) and by streamlining regulation, SEZ and industrial cluster development support and stimulate business, trade, investment and commercial activities in twin cities (ADB, 2016a). SEZs especially provide twin cities with business- and trade-easing services, including simplified administrative procedures and governmental supports for technological transfer or human resources development (Kudo, 2009). Further, SEZs generally focus on the creation of industry clusters, which arguably fuel economic activities in the twin cities, since the related industries can develop joint solutions and combine resources to better assess and invest in market opportunities (ADB, 2016a).

At the end of the day, twin cities benefit largely from facilitation-oriented policies. First, the easing of cross-border trade and investment effectively channels and stimulates economic relationships between the two urban centres. Second, the implementation of SEZs along the border provides twin cities' businesses with useful infrastructures, regulatory environment and public services to develop and take advantage of more market opportunities brought by the agglomeration of resources.

Dimension V: Collaboration

Twin cities, as an ultimate step in promoting co-development between the two urban centres, collaborate in spheres such as city administration or civic institutions (Anishenko & Sergunin, 2012). Both central and local administrations involve in pro-active promotion of common structural changes, leading to the emergence of new articulations of investment and spatial administration (Arnold, 2010). To such extent, the establishment of cross-border nodal institutions and agencies is key for planning, governing and managing common interests of the twin cities.

The collaboration takes place on several aspects. First, twin cities are potting soils for collaborative services jointly administered by the neighbour authorities (national and/or local): creation of a common market, organization and maintenance of border-crossing posts, cooperation in education, social security and healthcare systems and co-participation in cultural events. Second, twin cities share the management of infrastructure projects, public spaces and buildings to ensure joint efforts in fostering connectivity between the cities. Third, in the objective of a common "smart" cities development, twin cities commit in open data policies.⁵ Hence, administrations share data, technology systems and digital platforms to encourage the mutual development of digital sectors. Finally, authorities implement a common promotion of local stakeholders' interests at the national and international levels, to foster inclusive co-development around twin cities.

Administrative collaboration aims at enhancing mutual development of the two urban centres across the border by ensuring a high cohesiveness of institutional and governance setups between the twin cities, but also within territories. By establishing new co-regulatory regimes,

⁵ Smart cities refer to urban areas leveraging electronic data to manage resources and assets efficiently and sustainably. The collected information usually supports the management of transportation, energy, water, waste systems, schools, law enforcement, hospitals, etc. (McLaren & Agyeman, 2015).

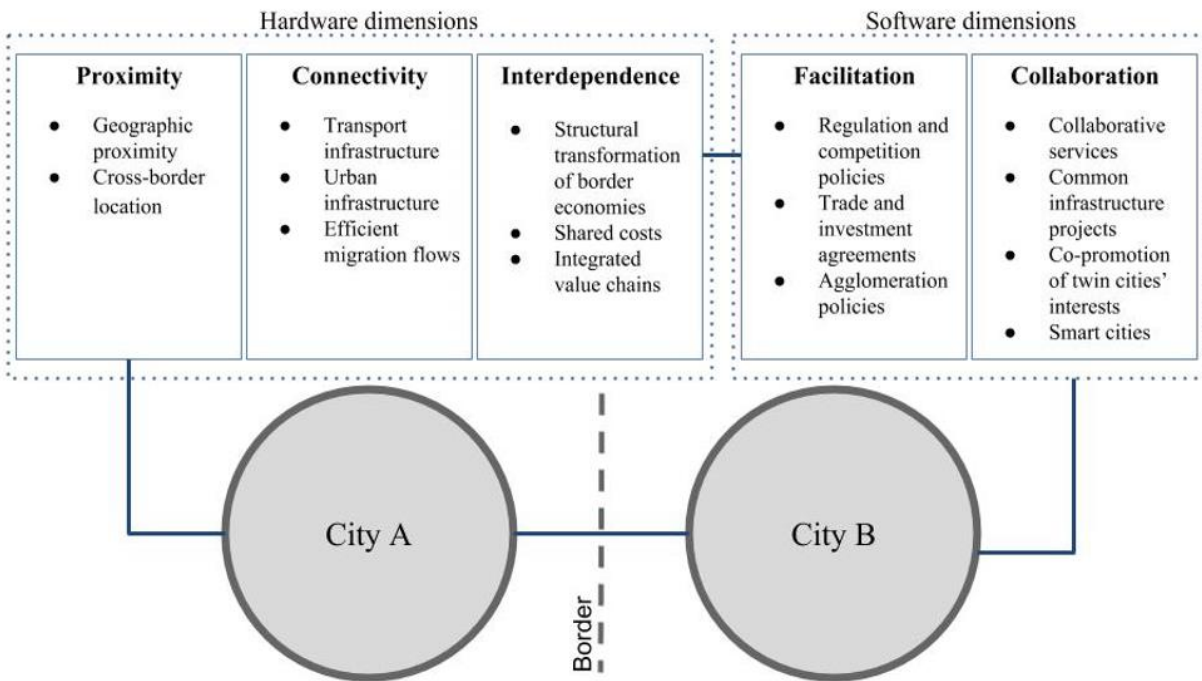
whether they are local, national or trans-national, twin cities channel internal and external resources towards dynamic, promising, inclusive and desirable activities across the border (Brunner, 2013).

2.3 Conceptual framework of cross-border twin cities

The thematic analysis conducted in this study is an attempt to comprehensively conceptualize the twin cities phenomenon. As a result, five dimensions shaping the twin cities, i.e., proximity, connectivity, interdependence, facilitation and collaboration, are highlighted. Notably, the full achievement of the five dimensions is not perfectly observable, but twin cities remain a potential development strategy that requires proper policy framework and actions.

The framework is conceptualized as follows (as shown in Figure 1). First, twin cities are urban centres, closely located but separated by an international border (e.g., a land, a river or a strait border). Second, twin cities are strongly linked together by developing a transport network that made of both hard and soft infrastructures, by investing in urban infrastructures and by fostering optimal migration flows. Third, twin cities' economies are interdependent, driven the structural reconfiguration of the border economies, regional economies of scales and a common integration into a cross-border value chains (or international production networks). Fourth, the twin cities' respective local and national authorities commit into the implementation of policies shaping firms structure, trade and investment agreements and agglomeration policies to foster mutual development of the local industries and attract investment. Fifth, twin cities' institutions, national and local actors collaborate administratively in providing common services, investing in common infrastructure, promoting co-interests and fostering digital cooperation. It is eventually crucial to mention that the twin cities phenomena, beyond potential opportunities for cross-border development of nodes, may also raise social challenges, which are presented in Box 1.

Figure 1. The twin cities phenomenon: key dimensions



Source: Authors' illustration

Box 1. Emerging challenges from cross-border twin cities

The twin cities phenomenon does not go without challenges that counter benefits and positive impact of cross-border development when not addressed by policymakers. Such challenges particularly arise in the intersections left by inconsistent economic and social policy frameworks. Issues, which are inherent to border opening and urban developments, may include, among others, human trafficking and other illegal activities, or social, gender or health issues. Among them, smuggling and numerous issues arising from illegal migration are evoked in this box.

The first challenge twin cities face when fostering cross-border trade is the rise of informal activities along the border, especially smuggling activities overcoming state regulatory practices. Unauthorized trade is mainly facilitated by the people's intimacy with the borderland, the existing local consumption patterns and the ethnic networks mediating the movement of goods (Lee, 2015). State initiatives to reduce illegal trade across the border, such as wall-building and patrolling, are often transgressed and overcome by the use of people's local knowledge.

Second, cross-border irregular migration arising from under-regulated twin cities fuels numerous issues including human trafficking, gender inequality and HIV/AIDS pandemic. Migrant workers are highly vulnerable to trafficking when the migration process is undocumented and not legalized (Paitoonpong, 2006). Illegal migrants generally take voluntarily the decision to travel but are forced to pay brokers to cross the border. They often encounter sexual assaults or coerced into forced labour, prostitution or drug trafficking (ibid.). The opening of the border for migration flows between the cities without a common healthcare system or social services also has a differential impact on men and women, and arguably raises gender issues (Jones, 2012). When the cities are not able to control the identity of migrants and

thus to integrate them into healthcare or social services systems, the migrants organize their social protection with the available support they have, including public support in the city and family support back home. In these situations, women not only appear to be more vulnerable, subject to tighter family or social norms on their behaviour but also suffer from higher sexual assault rates (Kusakabe & Pearson, 2016). Migration, human and drug trafficking, sexual assaults and prostitution are several reasons why the HIV/AIDS spreads around border-crossings (IOM, 2010; Paitoonpong, 2006). Migrants are increasingly in contact with local populations and facilitate the HIV/AIDS pandemic. But mostly, it is the lack of healthcare, social services, education, jobs and urban amenities that increase the spread of HIV/AIDS (USAID, 2003).

The increasing flow of goods and people generate several challenges threatening social conditions of labour forces across twin cities. Two main issues inherent to twin cities phenomenon have been mentioned, namely (i) smuggling and (ii) illegal migration resulting in human trafficking, women's poor social conditions and the HIV/AIDS pandemic. However, many challenges can be added to this list and must be properly identified and addressed by policymakers, especially when considering that they mostly counter the positive effects of the twin cities phenomenon and cross-border development.

3. Development of cross-border twin cities: Case studies along Thai borders

To validate the concept of twin cities and illustrate related policies and institutional frameworks, this study assesses some cases on Thailand's borders with its neighbouring countries. Special focus is on Thailand because the nation is a potting soil for the twin cities phenomenon especially along economic corridors. By positing Thailand as the central state, the nation might serve as a base economy for comparison, while the differing rates of its exports and imports among neighbouring twin cities will reflect flows of goods and supply chains relative to one central point.

Case study approach provides people's first-hand experience and real-life situations and thus can offer a solid basis for generalization (Stake, 1978). The use of different data sources is crucial in case study analysis and reveals issues that would otherwise be hidden. Accordingly, the authors conducted a qualitative research based on an intensive review of academic, institutional and governmental literature. The cities' characteristics, socio-economic indicators and policy actions emerging from the review are assessed and categorized to support key dimensions of the twin cities concept, as previously conceptualized. Since all cases assess closely located cities (within the 0-30km range), only two hardware dimensions are investigated

and detailed, *connectivity* and *interdependence*.⁶ Regarding the software dimensions, only the facilitation efforts are detailed, since the case studies revealed very little *collaboration* between authorities.

Three cases are investigated in this work: (i) Myawaddy (Myanmar) and Mae Sot (Thailand), (ii) Nakhon Phanom (Thailand) and Thakhek (Lao PDR), and (iii) Mukdahan (Thailand) and Savannakhet (Lao PDR), all of which are located along the Thai borders with either Myanmar or Lao PDR, as shown in Figure 2. Those twin cities are medium sized urban centres, of relative but similar demographic size (as presented in Table 2) and are increasingly becoming important through their integration to cross-border value chains and socio-economic development process.

Table 2. Demographic of the studied cities and their provinces

Country	City Population	Province/State Population
Thailand	Mae Sot 63,400	Tak 526,382
Myanmar	Myawaddy 210,540	Kayin 1,700,000
Thailand	Mukdahan 44,790	Mukdahan 336,107
Lao PDR	Savannakhet 120,000	Savannakhet 970,000
Thailand	Nakhon Phanom 26,437	Nakhon Phanom 583,726
Lao PDR	Thakhek 90,491	Khammouane 358,800

Source: Authors' construction based on Thailand National Statistical Office (2013), Lao Statistics Bureau (2015) and Myanmar Information Management Unit (2016).

⁶ The remaining *proximity* dimension can be observed from the maps below (Figures 3, 5 and 8).

Figure 2. Map of select twin cities in the GMS



Source: Authors' construction based on United Nations (2009)

- Mae Sot - Myawaddy border-crossing
- Nakhom Phanom - Thakhek border-crossing
- Mukdahan - Savannaket border-crossing

3.1 Mae Sot and Myawaddy

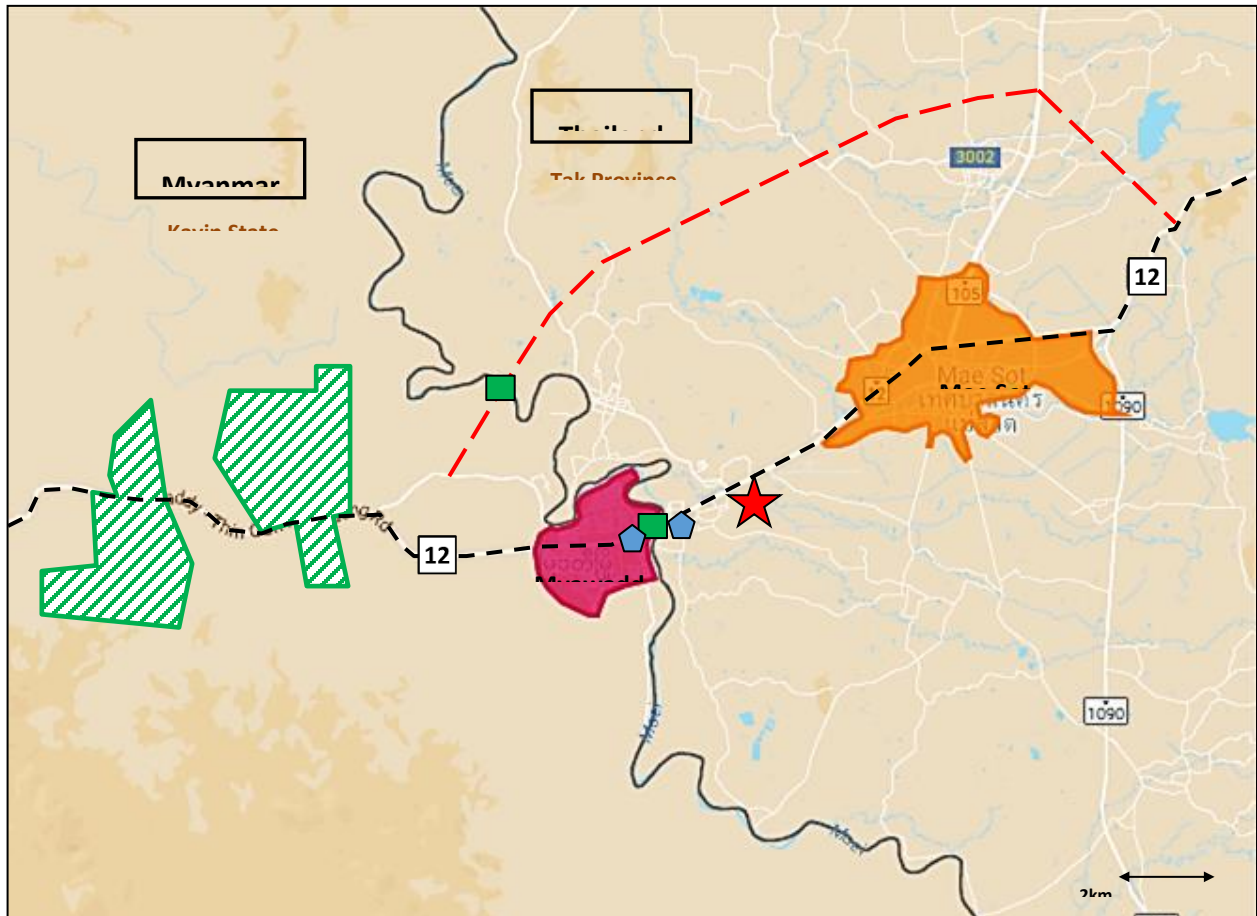
Mae Sot and Myawaddy jointly conduct economic activities across the Thai-Myanmar border and present high potential for their economies to be interdependent and integrated further. The *Mae Sot* (Thailand) and *Myawaddy* (Myanmar) border-crossing, separated by the Moei River, is of great importance for the Thai-Myanmar relationship (Figure 3). On the Thai bank, Mae Sot, an ancient administrative town, is currently the provincial capital city of the Tak province in the north-central region of Thailand. Nicknamed “Little Myanmar” by locals, Mae Sot has hosted many Burmese refugees, especially since Myanmar’s civil war started in the Kayin state in the late 1940s. Since then, thousands (estimations seem to be ranged from 38 000 to 140 000) of Burmese crossed the Moei River to avoid political oppression and to benefit from Thailand’s social services and job opportunities (Siu, 2014). Myawaddy, on the Burmese bank of the Moei River, has an assumed existence of over 2 500 years. It was several times used as a checkpoint for military actions from the Burmese invasion of Thailand in 1566 to the Japanese invasion of Myanmar during the Second World War (Myint, 2015). The trade between the two cities has always been consequent, but the construction of the Thai-Burma Friendship Bridge across the river in 1997 transformed the two cities as gateway and interchange hubs between Thailand and Myanmar (ibid.). Mae Sot and Myawaddy are now connected through an improved transport network and an increased number of complementary industry clusters.

Connectivity

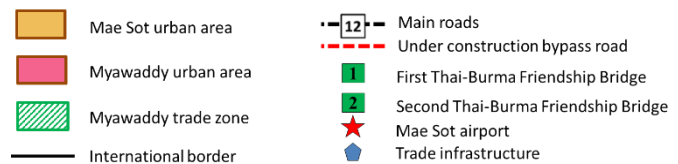
Mae Sot and Myawaddy are part of a growing transport network within the EWEC, connecting the cities again across the border. The two cities have improved the network of infrastructure connecting them to the other economic hubs along the EWEC, such as Da Nang (Viet Nam), Yangon (Myanmar) or Bangkok (Thailand). As an illustration, the Mae Sot industry – and potentially the Myawaddy industry – has a logistical advantage compared to Yangon with the well-paved and maintained 490 kilo meters road connecting Mae Sot to the Bangkok Port (Kudo, 2009). A small-scale international airport in Mae Sot also provides access to Bangkok and Chiang Mai (unfortunately a scheduled international flight from/to Yangon was cancelled on 1 May 2018). On the other side of the river, Myawaddy is an important hub of the Asian Highway (AH) network in Myanmar, as it is the main access point to routes AH1, AH2, AH3 and AH4 and the main transit point for trade with Thailand in term of value (Naing, Chulasai, & Panthamit, 2014). The twin cities are connected since 1997 by the Thai-Burma Friendship Bridge, financed by the Thai

Government, while the second Thai-Burma Friendship Bridge, connected bypass roads and associated trade facilities, such as customs and bond facilities, are presently under construction at the northern part of the twin cities to meet with growing traffics.

Figure 3. Mae Sot and Myawaddy spatial organization



Source: Authors' construction



The two cities moreover share electricity supply and reduce the cost of investments in such infrastructure. Myawaddy factories and households are provided with electricity by a Thai company based in Mae Sot (Kudo, 2009). Industries in Myawaddy have access to a reliable electricity supply, which is commonly a major obstacle throughout Myanmar for commercial and manufacturing activities, although this remains an informal understanding between the two cities'

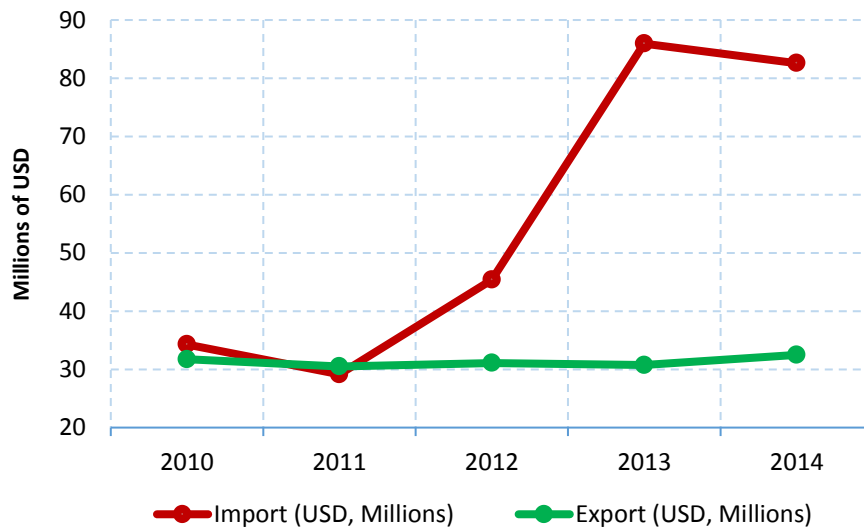
authorities without any official agreement. Kudo (2009) argues that an official and legal agreement on such cross-border electricity supply would ensure the optimal share and use of a reliable and constant electricity supply by the twin cities for the long run.

Although transport and utility infrastructures, such as roads, electricity and water supplies, have been developed, both Mae Sot and Myawaddy still lack crucial legal and urban infrastructure to ensure the proper formation of labour force supporting the twin cities' labour-intensive industries (mostly garment and apparel). Most of Burmese workers illegally migrate to Mae Sot, or through the city to other parts of Thailand, and local Thai companies are reluctant to employ them due to their illegal status. On the other hand, urban amenities in Myawaddy are not developed enough for the Burmese migrants who would like to return to their homeland to settle. As a result, Myawaddy has yet to develop sufficient labour force base to support its growing industry, while firms operating in Mae Sot are reluctant to employ more Burmese migrants, as these workers are mostly illegal (Kida & Fujikura, 2014).

Interdependence

Mae Sot and Myawaddy, as well as their respective regions, differ in industries and endowments. Mae Sot has a cluster of garment and textile factories, while on the Burmese side, the Kayin state relies mainly on agro-based industries (including rice, rubber, sugarcane, coffee, cardamom and seasonal produce) and animal husbandry. Mae Sot garment industry exports to Myanmar, but also to other markets such as ASEAN member states and Japan (Ishida, 2013). Mae Sot has attracted large numbers of migrant workers from neighbouring Myanmar. It is estimated that garment and apparel factories in Mae Sot employ over 20 000 Burmese migrant workers (Negishi, 2014). Mae Sot's agro-industry processes Myawaddy's cash crops such as maize and mung beans, while the city has also attracted bio-fuel developers such as the Mae Sot Clean Energy Company, which built there an ethanol plant (ibid.). Myawaddy also has the potential for developing its garment and apparel industry if linked to Mae Sot's industrial cluster (ibid.) In addition, Myawaddy could develop high technology industries, such as electrical appliance or automobile part manufacturing, which would be well integrated in the electronics and automotive industries of Thailand through Mae Sot (Kida & Fujikura, 2014). The opening of the border for trade between Mae Sot and Myawaddy in 2013 has had a notable and positive impact on trade between the two cities, as shown in Figure 4. The import of Myawaddy products in Mae Sot was nearly doubled from 2012 to 2013 and suggests deeper engagement between the industries of both Myawaddy and Mae Sot.

Figure 4. Trade at Mae Sot, 2010-2014, \$ million USD



Source: The authors' based on data provided by the Mae Sot Customs House in 2016.

Facilitation

Both national governments have developed SEZs to foster the twin cities' local industries, export businesses and further integration. SEZs' incentives, such as tax and duty exemptions, onsite administrative services and reliable power and utility supplies, have enhanced economic interdependence between Mae Sot and Myawaddy by attracting investments and creating businesses opportunities across the borders. The twin cities however still lack of necessary infrastructure, investment and policy support to be fully integrated with its counterparts and to favour optimal formation of the labour forces. On the Mae Sot side, the Tak Special Economic Zone extends a variety of investment incentives to the agricultural and construction sectors in 14 sub-districts. Local business owners and others lobbied the Government of Thailand to provide the incentives throughout the Tak province so that its local businesses would compete well with those newly invested in Myawaddy (Abonyi & Zola, 2014). On the side of Myanmar, several investment incentives are offered within the Myawaddy Industrial Zone, which was opened in 2017, such as three-year income tax exemption or same tax rates for foreign workers as their domestic counterparts. To encourage the development of infrastructure, construction equipment and machinery are exempt from import duty, and for any agent, the import of construction materials is also duty exempt for the first three years of operation. The Myawaddy Trade Zone

also provides full administrative services to both domestic and foreign investors, facilitating to deliver investment incentives. One key incentive available to those invested in the trade zone is the one-day onsite issuance of certificates of origin for agricultural products (ibid.).

Policy Implications

Mae Sot and Myawaddy need further facilitation and collaboration to enhance cross-border trade, investment and socio-economic integration. We particularly suggest the two cities to work with following priority issues. First, both governments are strongly suggested to establish a single window to facilitate customs procedures and documentations by implementing an electronic data exchange system for all stakeholders. This action facilitates paper-less trade and enhances transparency while accelerating the speed of customs procedures. Second, dry ports, which contain such logistical facilities as container depots, yards, and truck terminals, can be developed particularly at the Mae Sot side. Mae Sot has not established a geographically designated SEZ at the border-crossing, so centralized logistical facilities and a dry port would provide such facilities and enhance trade and transportation.⁷ Third, labour movement facilitation is crucially needed to supervise the migration and enhance the work condition of Burmese workers in Thailand. Illegal migrants are not allowed to work in Thailand, causing firms located in Mae Sot to be reluctant to hire Burmese workers who often come to Thailand illegally. A mutual agreement that allows Burmese workers to join in the Mae Sot job market would provide the city with an adequate labour force to match with the demand of its labour-intensive industry. Fourth, in addition to the legal framework tackling the issue of illegal migrants, both cities – Myawaddy in priority – would lastingly benefit from comprehensive investment programmes in the development of their urban amenities, most notably of the educational, recreational, sanitary and health infrastructure. Not only these developments would ensure the right incentives for illegal workers in Mae Sot to settle back in Myawaddy and support its industry, but it would also limit risks of HIV/AIDS pandemic on both sides of the border. Fifth, a formal framework is needed to officially allow Thai electricity companies to export electricity across the border, and the Myawaddy firms to use it. This would ensure an optimal cost sharing in electricity production and distribution between the two cities through effectively sharing crucial infrastructures for cross-border

⁷ Instead, Mae Sot designated its entire territory as SEZ providing a universal incentive scheme to investors (Abonyi and Zola, 2014).

economic activities. Such shared infrastructures would be also used for other logistical and utility services in the future. Sixth, the SEZs surrounding the border crossing are still at the first stage of their development. As the next step, a jointly developed cross-border special economic zone (CSEZ) could be developed by the two cities to foster trade, investment and labour movement, considering their comparative advantages, endowments and strengths.

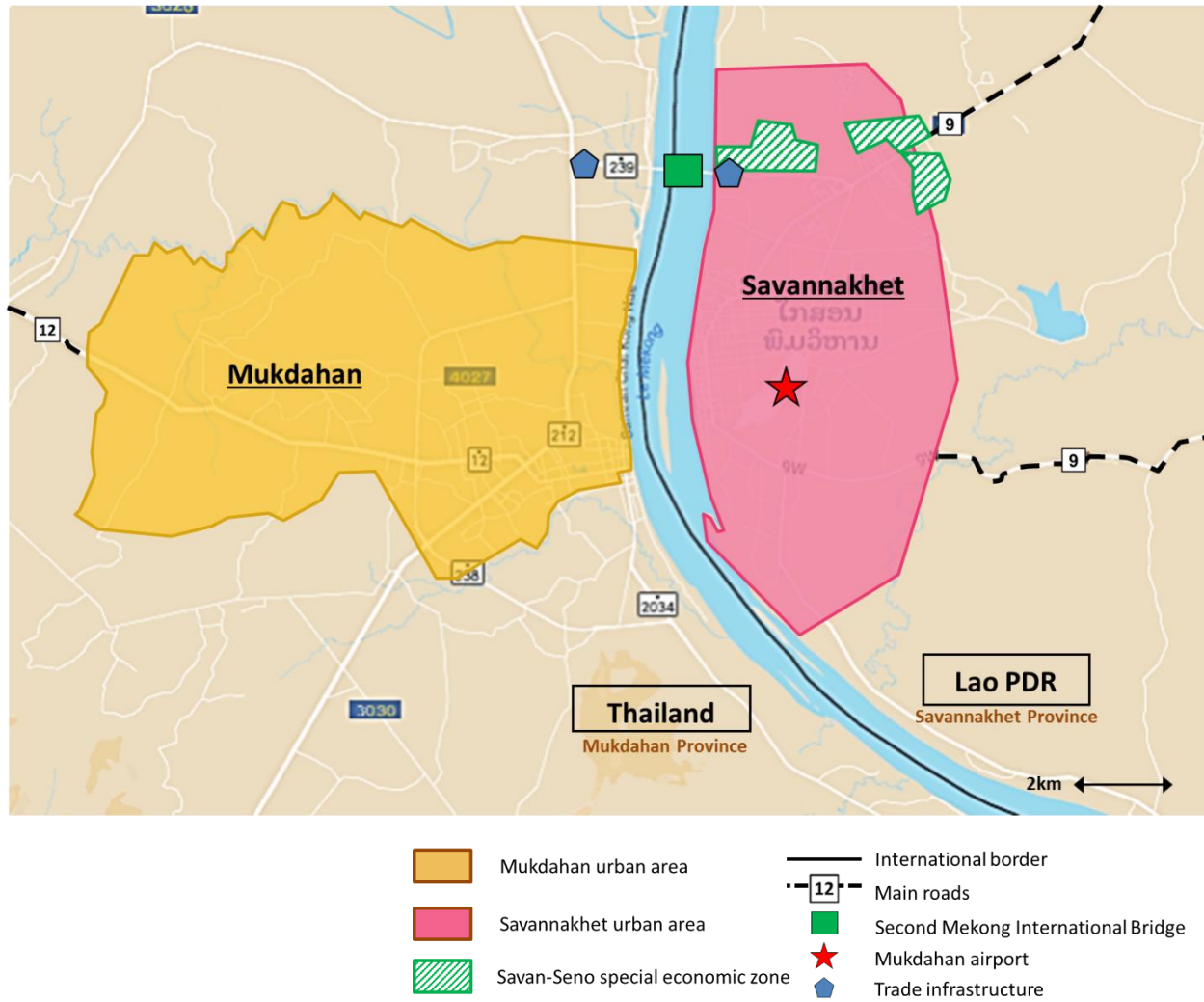
3.2 Mukdahan and Savannakhet

Mukdahan (Thailand) and Savannakhet (Lao PDR) have officially been recognized as “twin cities” under the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS) (Lainé, 2015)⁸. Mukdahan and Savannakhet are two province-wide urban and economic centres on the EWEC, facing each other across the Mekong River and linked by the Second Thai-Lao Friendship Bridge (also known as the Second Mekong International Bridge⁹) (Figure 5). Mukdahan, on the west bank of the river (Thai side), has a history going back to the late Ayutthaya period in the 18th century. The city, being completed and named in 1770, used to span on both sides of the rivers. On the east bank of the Mekong River (Lao side), the city of Savannakhet, which was previously a district of Mukdahan, was ceded to France in 1893 to become a colonial administrative centre. The city experienced a development phase during the colonial period, first half of the 20th century, with the influx of Vietnamese (as French administrative staff) and Chinese migrants (as labours) and the construction of urban infrastructure (Lainé, 2015). Colonial infrastructures (such as buildings, schools, churches and hospitals) are still preserved as witnesses of the French occupation (ibid.). Considering their location, cultural, ethnic and historical links, the two cities are arguably a leading example of the twin cities phenomena and have great potential for economic integration through enhanced trade and investment flows.

⁸ The ACMECS is a political, economic and cultural cooperation programme among Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam since 2003. Many projects (46 at the subregional level and 224 as bilateral projects) have been implemented under the programme since its creation.

⁹ The First Thai-Lao Friendship Bridge connects the city of Nong Khai in Thailand with Vientiane, the capital of Lao PDR, since 1994.

Figure 5. Mukdahan and Savannakhet spatial organization



Source: Authors' construction.

Note: The Mukdahan SEZ spans all over the Mukdahan Province.

Infrastructure

Mukdahan and Savannakhet are well connected with other important economic centres through the EWEC (Lainé, 2013). Mukdahan is a neighbour to Khon Kaen, considered as the capital of the north-eastern region of Thailand, while Savannakhet is a major commercial node of both Road 9 (i.e., EWEC) and Road 13, which links Vientiane, the capital of Lao PDR, and the Southern Economic Corridor in Cambodia (ibid.). The construction of the Second Thai-Lao Friendship Bridge and its adjacent infrastructures, opened in 2007 and co-financed by the ADB, JICA and the Governments of Thailand and Lao PDR, was a turning point in the expansion and

internationalization the twin cities. The bridge facilitates cross-border trade and people's movement through new transportation mode via roads, as opposed to the previous modes of transport which were limited to ferries and boats (Supatn, 2012). Prior to 2007, the river crossing for vehicles was only possible via ferries, serving 700 cars and 17 000 trucks annually between 2003 and 2006, which increased to 160 000 cars and 53 000 trucks in 2009 (ibid.). In parallel to the bridge construction, Mukdahan and Savannakhet implemented a range of trade facilities and developed urban infrastructures that fostered cross-border trade, including customs houses, immigration buildings, an international bus system and warehouses along the river (Lainé, 2013). As a consequence, Mukdahan and Savannakhet experienced unprecedented urban expansion and dynamism through the modernization of old city centres, the extension of the urban perimeters and the development of new commercial centres (ibid.).

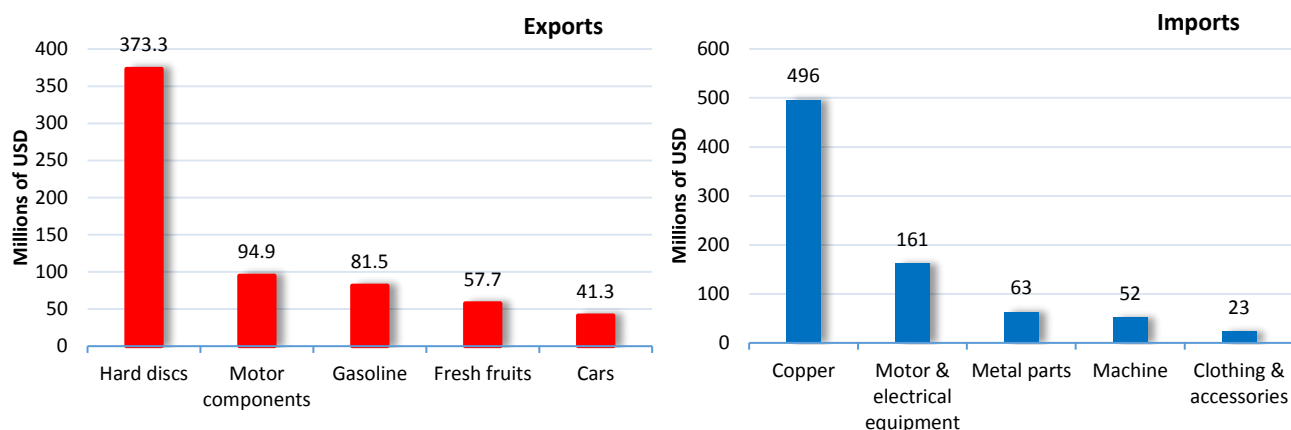
Interdependence

Mukdahan and Savannakhet have also potential for developing complementary economies which, through the trade of raw material and intermediate goods, would be integrated into cross-border value chains. Savannakhet province has the largest share of agricultural production in Lao PDR, with half of the province's gross private product (GPP) accounting to this sector and hosts the largest handicraft sector consisting of mostly small enterprises engaged in wood products, garments and food processing (Warr, Menon, & Yusuf, 2010).¹⁰ On the other hand, Mukdahan province is less industrialized, the manufacturing sector accounting for only 10% of its economy. The province relies largely on the services sector which accounts roughly for 46% of the provincial GPP (ibid.). Trade plays a major role between the economies of the two cities, which indicates the existence of cross-border value chains.¹¹ Figure 6 illustrates that Mukdahan mainly imports raw materials, components/parts and cloths from Savannakhet (Supatn, 2012). Main exports from Mukdahan to Savannakhet are electronic components, such as hard disk drives, and fresh fruits, in addition to auto parts, gasoline and cars.

¹⁰ Gross private product (GPP) is the private sector's aggregate output values in a nation, calculated by gross national product (GNP) minus income originating in government and state-owned enterprises.

¹¹ The composition of trade at the border may show some pattern indicating the presence of cross-border value chains. However, it is still unknown where the origins of traded products are. For instance, most of the car parts/components could be produced in Bangkok or Hanoi. Further study is needed in this field.

Figure 6. Mukdahan: top five imports and exports, 2014, \$ million USD

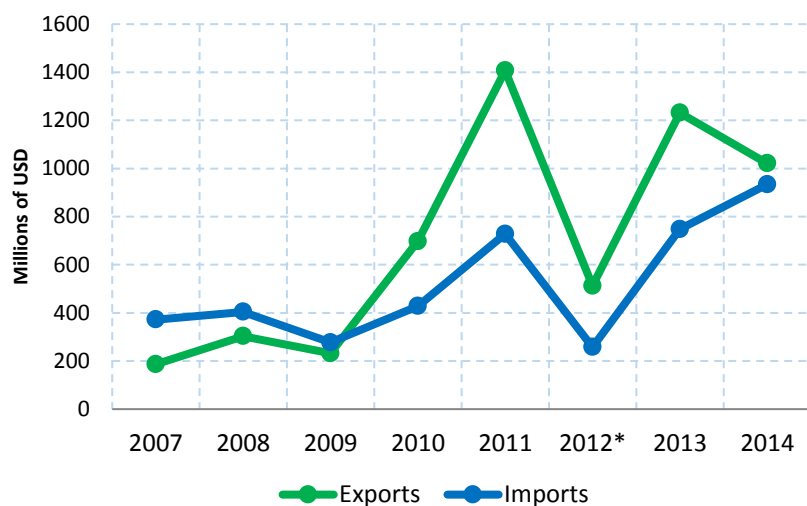


Source: The authors' based on the data of ADB (2016b).

The linkages between the two economies have been seemingly strengthened since the opening of the international bridge in 2007. A clear symptom of this increasing interdependence is the surge in cross-border trade that the twin cities have experienced from 2007. Figure 7 presents recent trade data as reported by the Thai Customs Houses, from the years 2007-2014. Trade between Mukdahan and Savannakhet, though it experienced upward growth from 2009 to 2011, had a large drop in 2012, as traffic shifted to the Nakhon Phanom and Thakhek border crossing. It recovered quickly in 2013, with trade at Mukdahan accounting for 26 per cent of all Thai exports to Lao PDR (Fernquest, 2013).

Mukdahan also serves as major gateway to tourism in Lao PDR and Viet Nam. Tourism, as authorities have noted, has also flourished near the crossing, mainly thanks to the opening of the Savan Vegas Casino in Savannakhet in 2009. The casino complex, which consists of a casino, a hotel and a restaurant, was reported to generate 2.1 million USD in 2011 (Lainé, 2015). While Mukdahan has a sizable number of tourists, Savannakhet hosts twice as more as Mukdahan does, as can be seen in Table 2.

Figure 7. Trades through Mukdahan customs, 2007-2014, \$ million USD



Source: Authors' reconstruction based on ADB (2016b).

Notes: (*) Trade dropped in 2012 as traffics shifted to the Nakhon-Phanom and Thakhek border crossing.

Table 3. Number of tourists and share of international tourists by province, 2007

	Province	Total tourist arrival	Share of international tourists, %
Thailand	Mukdahan	286 678	1.7
Lao PDR	Savannakhet	661 929	25.2 (44.6% from Thailand)

Source: Authors, based on Fau, *et al.* (2014).

Facilitation

The border-crossing hosts several policies easing trade, investment and business. Mukdahan and Savannakhet first benefited from the Greater Mekong Subregion Cross-Border Transport Agreement (CBTA) since its implementation in 2008 (Souvannavong, 2010). The CBTA is meant to ease cross-border movement of people engaged in transport operations, harmonize transit traffic regimes and implement one-stop customs inspections. Such single-window inspection reduces the time spent at the cross-border checkpoints and increases available trade data between the two cities (*ibid.*). It is estimated that Thailand and Lao PDR checkpoints require only 10 and 20 minutes, respectively (Warr, Menon, & Yusuf, 2010). Second, the Savan-Seno SEZ, nine kilo meters from the second Thai-Lao Friendship Bridge and five kilo meters from the

Savannakhet Airport, was first developed in 2002-2003 on the Lao side to promote manufacturing (e.g., automotive parts, electronics and agricultural products) and export processing and provide a service and logistic centre close to the border (Suzuki & Keola, 2008). It consists in a trade and services zone, a logistics and transportation zone and an industry and manufacturing zone (ADB, 2016a). By 2014, the SEZ seemingly attracted more than 200 million USD from 57 companies, mainly from Japan, Lao PDR, Malaysia and Thailand and experienced an influx of manufacturers and high skilled workers (SavanPark, 2014). The Savan-Seno SEZ is now equipped with Lao PDR's first dry port (Laotian Times, 2018). Third, the Mukdahan SEZ, which was designated in 2014, covers three districts and 11 sub-districts with a total of 588.5 square kilo meters in the province of Mukdahan (Office of Commercial Affairs, n.d.). Many policy objectives of this SEZ are in line with agro-industry's interests, including accommodating crop drying and silo facilities, animal feed production and plants for agro-industrial by-products (Bangkok Post, 2017). The SEZ has yet to open although land sales, road constructions, a high-speed railway project and providing electricity, water and drainage services have been initiated to support the zone (ibid.). Quite notably, the Mukdahan SEZ is conceived as a partner to the Savan-Seno SEZ, instead of being a competitor. However, little cooperation seems to exist between national and regional authorities regarding the implementation of the SEZ, with the operations being mainly piloted by the Prime Minister's office (The Isaan Record, 2016). Local communities' misunderstanding of the project likely creates oppositions to the project, with main concerns being threats upon local citizens' businesses, fear of land evictions and environment health (ibid.).

Policy implications

Although Mukdahan and Savannakhet have developed infrastructures and implemented CBTA and SEZs to escalate the cross-border development and foster local industries, additional policies must be implemented by the authorities. First, the twin cities would largely benefit from the full implementation of the CBTA at the border-crossing. Although Thailand and Lao PDR signed and ratified most annexes and protocols of this multilateral agreement, its full implementation has yet to be achieved, in addition to still-inadequate border and ICT infrastructures. More trade facilitation measures are needed, for instance, multi-entry visa, recognition of driver license, harmonized transit regime and generalization of phytosanitary inspections. Second, the Mukdahan SEZ, if implemented in cooperation with local citizens and with high considerations for local environment, would benefit the local economy. Enhanced inclusion of local authorities – and local businesses – in the SEZ development process is thus

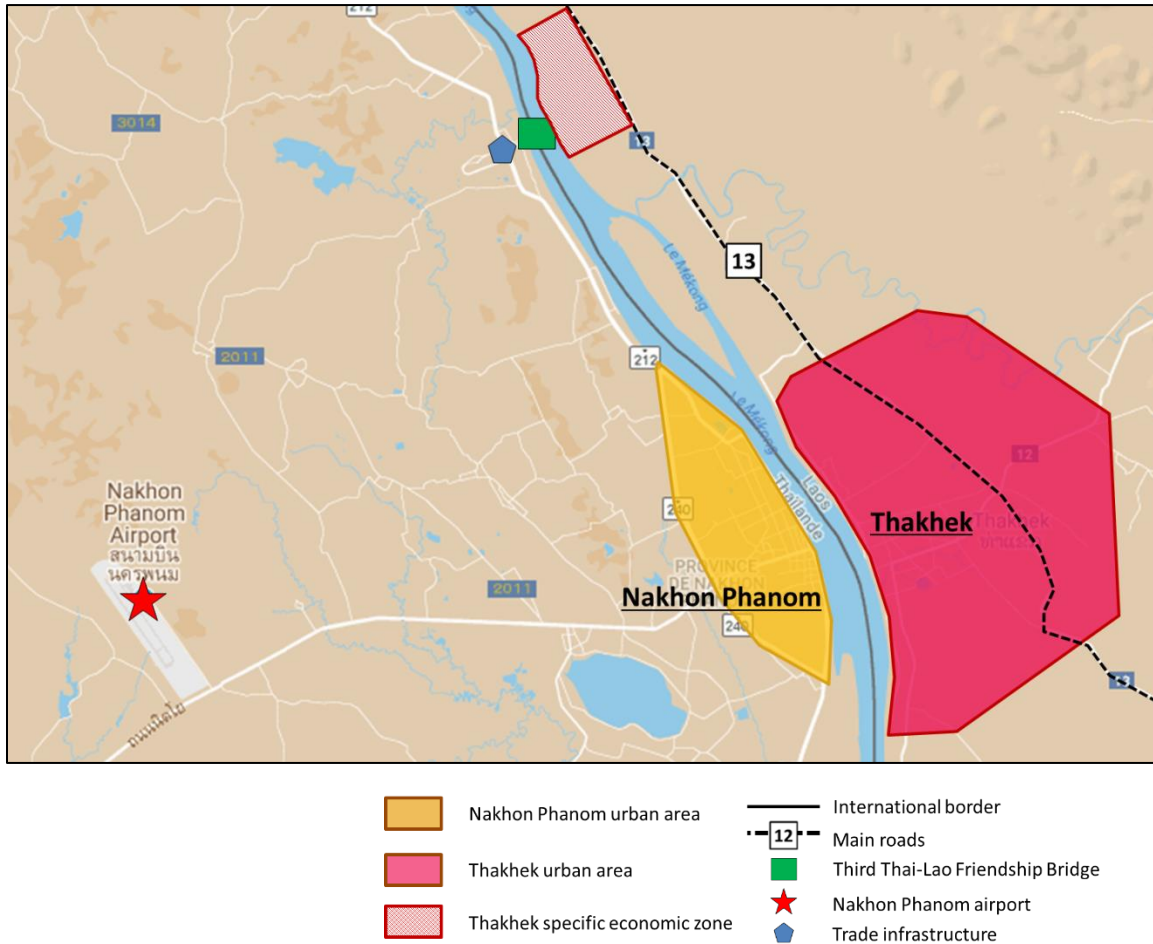
needed to palliate misunderstandings of the project's benefits. Third, relatively weak Thai investment has impacted asymmetrically the urban development of the border-crossing. Mukdahan has thus experienced less spatial reorganization than Savannakhet has done, mainly due to less attention given by the central government. Thailand's investments in infrastructure for Mukdahan would be therefore crucial, and complementary to the actual enforcement of the SEZ, to secure a balanced development between the twin cities. Fourth, Mukdahan and Savannakhet would benefit more from cross-border administrative collaboration, especially given their shared historic heritage and common social and ethnic features. For instance, jointly designed and implemented cultural projects, education systems or tourism promotion projects could easily facilitate the integration and cross-border development of the two cities.

3.3 Nakhon Phanom and Thakhek

Nakhon Phanom (Thailand) and Thakhek (Lao PDR) are also separated by the Mekong River. Nakhon Phanom "The City of Hills," at the heart of the traditional *Isan*, or Thai north-eastern, culture, is known for having hosted a secret United States air base during the Viet Nam War (Sweet, 2001). On the Lao side, the history of Thakhek, "Foreign Crossing" in Lao language, remains unclear, although its modern disposition is due to the French colonial occupation, being quite similar than what can be seen in Savannakhet and Pakse (other French colonial administrative towns). Thus, both cities are known for the American presence during the Viet Nam War (Nakhon Phanom) and for hosting well-conserved vestiges of the French colonization in Indo-China (Thakhek). As such, the two cities have a historical value, which is recognized by both administrations and attracts the tourism sector. Both Nakhon Phanom and Thakhek have been developed mostly as a rural and agricultural economy.

Today, the two cities increasingly play the role of a transit node for the logistical network linking Thailand and Viet Nam through Lao PDR. Thai and Lao Governments have notably promoted socio-economic synergies around this node through the Third Thai-Lao Friendship Bridge (also known as the Third international Mekong Bridge) physically linking the two cities (Figure 8). The bridge connects the two cities' infrastructures and opening new road networks from Thailand's industrial clusters to Viet Nam's seaport infrastructures through Lao PDR's economic centres.

Figure 8. Nakhon Phanom and Thakhek spatial organizations



Source: Authors' construction.

Note: The Nakhon Phanom SEZ spans all over the Nakhon Phanom Province.

Connectivity

The Nakhon Phanom-Thakhek border crossing, structured around the Third Thai-Lao Friendship Bridge and its associated infrastructures, has been a secondary gateway for trade between Thailand and Lao PDR after the Mukdahan-Savannakhet border crossing during the past decades. The 1.4 kilo metres bridge, opened for traffic in 2011, has provided the shortest way for both Thai and Vietnamese exporters to the other side's markets. The border-crossing also provides Thai businesses a gateway to Viet Nam's major seaports as it is linked to Road 12, the main road to the Vung Ang deep seaport and others in the northern coast of Viet Nam (Keonuchan, 2012).

In Nakhon Phanom, many projects have focused on strengthening transport infrastructures linking Lao PDR, especially as part of the Nakhon Phanom SEZ, which spans all over the Nakhon Phanom Province. A logistics centre and a warehouse were already constructed, while a new customs checkpoint building between the Nakhon Phanom Airport and the bridge, a border transport centre and a railway network are planned (The Government Public Relations Department of Thailand, 2017). On the Lao side, the construction of the Thakhek Specific Economic Zone, started in 2015, has driven several infrastructure projects, amounting \$3 000 million USD investment in 2015 alone (Mekong Institute, 2016). The SEZ is to bring Thakhek a wide range of trade, transport and logistics infrastructures including, among others, a warehouse, a distribution centre, public transport stations and an IT service centre. These would be supported by new urban amenities such as a sport centre and education and public health services including schools, a hospital and a medical device distribution centre (Ministry of Planning and Investment of Lao PDR, 2017). Furthermore, Thakhek has been the recipient of foreign ODAs focusing on infrastructure development, especially water supply. The Thakhek Water Supply Development Project, supported by Japan, aims to supply water to 50 000 people in urban Thakhek by the year 2020 with the construction of a new water treatment plant and 14.8 kilo meters of water pipelines (Embassy of Japan to the Lao PDR, 2016). Overall, the two provinces have better transport infrastructures than the national average although many are still under construction. However, the twin cities still lack quality urban amenities, especially on the Lao side, which curb the balanced development of both cities as firms are reluctant to settle without adequate living conditions for workers.

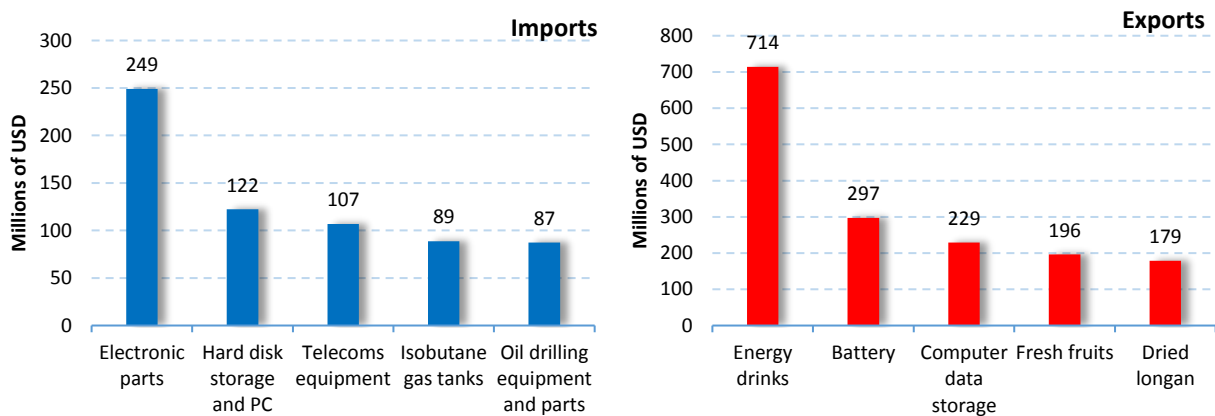
Interdependence

Nakhon Phanom province holds much potential within the agricultural sector, as more than 60% of the province's workforce is engaged in the sector, although only 31% of the province's revenue comes from agriculture and agro-industry (The Government Public Relations Department of Thailand, 2017). Major agro-industries in the Nakhon Phanom province include rice, natural rubber, pineapple, tapioca and tobacco. Nakhon Phanom also has two plants for meat processing registered with the Thai Industrial Standards Institute under the Ministry of Industry (Ministry of Industry of Thailand, n.d.). On the Thakhek side, main industrial sectors are small-scale low-tech manufacturing, agriculture and tourism. The province has a great potential in rice production to be exported to Thailand and Viet Nam. It also produces hydroelectricity, which is exported to Thailand's industries. In addition, the province and urban centre of Thakhek city inherit many

architectural legacies from the French colonial time and are a moderate tourist attraction (O'Hara, n.d.).

Trades between the twin cities suggest an increasing interdependence of their economies as well as their increasing role to be gateway hubs between Thailand and Viet Nam through Lao PDR.¹² Trade relations at the border remains disproportioned, with larger exports than imports to Nakhon Phanom. Nakhon Phanom typically imports electronics parts and components from Thakhek and exports consumer goods, car and electronics components and agro-products to Thakhek (Figure 9). Major imports to Nakhon Phanom, such as electronic parts and hard disks, are supposed to be produced in Viet Nam as Lao PDR has no such industries, while exports from Nakhon Phanom are Thai products.

Figure 9. Top five export and import products at the Nakhon Phanom customs, 2014, \$ million USD



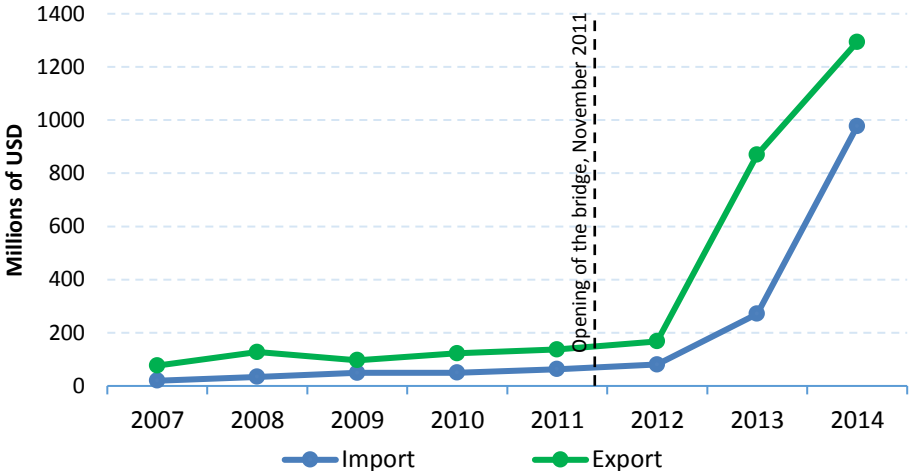
Source: Authors, based on ADB (2016b).

The opening of the Third Thai-Lao Friendship Bridge between Nakhon Phanom and Thakhek has arguably strengthened the economic links between the twin cities, as shown in trade data (Figure 10). Whereas import and export numbers remained low with relatively little fluctuation until 2013, trade traffic was significantly diverted from the neighbouring Mukdahan-Savannakhet

¹² As for Mukdahan and Savannakhet border crossing, the composition of trade is only indicative in showing the presence of cross-border value chains, given the unknown origins of the traded products.

border crossing following the opening of the international bridge in 2011. Imports increased from 271 million USD to 977 million USD from 2013 to 2014. Similarly, exports increased from 870 million USD to 1 293 million USD.

Figure 10. Trade at the Nakhon Phanom customs, 2007-2014, \$ million USD



Source: The authors' construction based on ADB (2016b).

Facilitation

To realize the potential of the twin cities, local governments and foreign investors have heavily invested in SEZs designed to attract the manufacturing sector, facilitate trade and transport and foster the cross-border value chains. The implementation of trade and transport facilitation measures at the SEZs is also expected to have strong positive effects on the industrial development of the twin cities, promoting the direction toward well-integrated or complementary economies. First, the Thakhek SEZ was established in 2012 with 400 meters from the Third Thai-Lao Friendship Bridge and 16 kilo meters from the city centre of Thakhek (Ministry of Planning and Investment of Lao PDR, 2017). The 1 035 hectares SEZ is divided into several zones, such as commerce facilities, department stores, restaurants, banking and finance, hotels and logistical services (KPL, 2018). However, the SEZ already faces a shortage of fund, although it attracted 22 domestic and foreign investment projects, amounting around \$12.9 billion USD from 2012 to 2018 (ibid.). There are also weak interactions between local authorities, SEZ developers and SEZ authority, as well as less interaction between the Lao officials and their Thai counterparts. Second, the Nakhon Phanom Economic Zone, established in 2015, is made of 13 sub-districts within two

districts, Muang Nakhon Phanom district and Ta U-Tane District, covering a total of 775 square kilo meters (BOI, 2015). Its proximity to the Khong River also provides for the potential of tourism development.

Policy implications

Further policies of and collaboration between local or national governments would lastingly foster cross-border development in integrating Nakhon Phanom and Thakhek. First, the main infrastructures of the SEZs declared around the Nakhon Phanom-Thakhek border-crossing must be completed to foster strategic industries across the borders. Logistics and trade infrastructures (custom point, transports) on the Nakhon Phanom side are crucial to leverage the shared use of the Nakhon Phanom airport. On the Thakhek side the large panel of infrastructure would support effectively the still struggling SEZ and give more incentives for investors and businesses. Second, the border-crossing would benefit from an easing and harmonization of trade procedures by the implementation of policies such as a single-window system and a transport agreement. Third, local and national governments must ensure that labour forces and enterprises have a proper environment to settle; thus, there is a need for policymakers and stakeholders to continue to invest in urban amenities. Fourth the lack of cooperation – either between central and local levels or between Thai and Lao sides – is counterproductive in supporting the development of partner SEZs with an efficient articulation between local/national governance. Enhanced coordination is needed – not only at the administrative but mostly at a strategic – is needed to fully benefit from expected SEZ returns and spillovers and the border-crossing. Fifth, given the historic heritage of the border-crossing, the twin cities would also benefit from a common promotion of tourism. The French colonial architectures in Thakhek is already a tourist attraction, and infrastructures on the Nakhon Phanom side, such as the airport, would foster the tourism industry in the twin cities.

4. Fostering cross-border twin cities: assessment and policy framework

This section provides a framework to assess the status and impact of the twin cities phenomenon and to develop necessary policy options to foster twin cities further. This framework also assists in policy-oriented analysis based on the strengths and weaknesses of the ongoing twin cities phenomena. It suggests socio-economic indicators to measure the benefits and flaws

of twin cities and the direction to design tailor-made policies to foster twin cities against inherent negative externalities.

4.1 Assessment of the status and impact of cross-border twin cities

Before implementing any policy, it is necessary for governments and stakeholders to assess the present status of twin cities based on socio-economic indicators. By mapping the characteristics of each twin cities phenomenon, policymakers can ensure that the policies are well framed and targeted to enhance mutual development and benefits of clusters, cross-border trade and investment. The indicators presented in Table 3 are based on the twin cities framework and its dimensions, which are presented earlier in this paper and can be applied to measure the impact of twin cities phenomenon. The indicators assess both the level and benefits of the twin cities' development.

Table 4. Indicators for the assessment of twin cities

Dimensions of twin cities		Indicators	
Hardware dimensions	Proximity	Cross-border location	Distance between urban centres (km); distance to international border (km); typical commuting distance to work (km).
	Connectivity	Transport infrastructure	Road transport at the border, track freight, air freight, water freight (million ton-km); quality of port, road and airport infrastructure; logistics performance index; quality of trade-related infrastructure; electric power consumption (kWh per capita); Internet users (per 1 000 people).
		Urban infrastructure	Sanitation facilities (% of urban population with access); improved water source (% of urban population with access); urban population (% of state/district).
		Labour mobility	Net cross-border flows (persons); share of labours to cross border out of total labour forces (% of total labours).
Interdependence	Integrated value chains	Labour productivity growth; competition advantage (RCA)	

			method ¹³); industry value added (% of GPP); employment in industry (% of total employment); labour force participation rate (% of total population ages 15+) (modelled ILO estimate); wage and salaried workers; (gross) capital formation; government revenue; extent of forging linkages with domestic SMEs; technology transfer and absorption; level of competition.
Software Dimensions	Facilitation	Regulation and competition	CPIA business regulatory environment index ¹⁴ ; ease of doing business index; enforcement of arbitration and mediating laws.
		Trade	Burden of customs procedure; tariff rate applied to manufactured products (%); merchandise trade.
		Investment	Burden of FDI procedure (time, cost); FDI inflows.
	Collaboration	Collaborative services	Joint actions on administration, number of signed agreements ,infrastructure development, trade and investment, education and other services; CPIA public sector management and institutions cluster average; CPIA economic management cluster average; adult literacy, population 15+ years, both sexes (%); unemployment (%); women and disadvantaged groups employment; health benefits and pension plans; minimum wage and level of labour conditions (e.g., conformity with ILO labour standards); extent of CSR programmes and their results; number of families lifted out of poverty.

Source: Authors' collection of existing indicators.

Note: The list is not comprehensive. Many other indicators assessing socio-economic characteristics of the cities can replace or be added to the suggested list.

¹³ The Ricardian comparative advantage (RCA) method reveals the relative advantage or disadvantage of a certain country in a certain class of goods or services evidenced by trade flows as a comparative advantage index.

¹⁴ World Banks' Country Policy and Institutional Assessment (CPIA) business regulatory environment index assesses the extent to which the legal, regulatory and policy environments help or hinder private businesses in investing, creating jobs and becoming more productive (The World Bank, 2010)

4.2 Policy Framework

Twin cities are a phenomenon that has great potential in fostering sustainable growth along border-crossings. Policymakers should implement comprehensive policy frameworks addressing benefits and challenges of twin cities to enhance such potential and achieve the mutual development of urban centres across borders.

The assessment of the twin cities' characteristics and local policies not only unveils the high potential for economic integration of twin cities, but also presents a significant room for further finely framed policies and cooperation to promote cross-border development around these urban centres. The three case studies have illustrated the validity of the twin cities concept and exemplify the need for further studies. The results also indicate that the twin cities phenomenon has emerged, although not optimally, and conveyed a great potential for mutual growth across international borders. Policy improvements were suggested for each case in order to illustrate the possible use of the twin cities framework in designing well-designed cooperative policies.

The role of central governments as key actors in the development of twin cities phenomena is here to be summarized. Thailand, Lao PDR and Myanmar, studied in this paper, have notable centralized governments. As twin cities are often second-rank cities in provinces not yet reaching their growth potential, they do not necessarily have local autonomy and resources to develop by themselves. Policies related to urbanization, borders (customs and immigration), transport infrastructures, SEZs, social and health issues are often the prerogatives of central governments. The lack of coordination and support from the national authorities to the local authorities induces questionable policy results and effectiveness. By extension, intergovernmental coordination and cooperation among central governments may also be at play in the development of twin cities, on both hardware and software dimensions.

Any step taken to upgrade transport network, improve urban infrastructure and foster complementary industries will not only foster local development but also lead the twin cities to a sustainable growth through an integrated value chain. Policy actions taken to facilitate trade, investment and administrative collaboration would also lastingly promote socio-economic development within twin cities, towards more connected, socially inclusive and solidarity cities. Following the earlier analyses, five policy areas are proposed, namely: (i) ICT improvement; (ii) urban development; (iii) industry development; (iv) labour mobility; (v) border regulation; (vi) social policies; and (vii) administrative collaboration. These proposals echo the strength and

weaknesses of the policies fostering the twin cities phenomena and seek to fill the institutional and regulatory gaps identified in the *aforementioned* case studies.

Data infrastructure, information and communication technology (ICT)

One of the greatest blocks to trade and to conducting monitoring and evaluating has been the serious limitation of accurate and up-to-date data. Being able to properly identify and evaluate the development of twin cities requires local-level data, which is not often published, is hardly accurate or simply does not exist. For instance, customs houses dealing in the same border area often produce differing numbers, invalidating any cross-border analysis. For this reason, it is essential to expand the practice and use of consistent ICT to produce, gather and share data publicly. The use of interconnected single window for customs transactions (with data exchange or cross-checking) is a first possible tool to ensure that data between borders remains consistent. In addition, digitizing customs transactions will allow public and private actors better access to collected data, and thus design more accurate policies. Technology transfers related to the customs are typically useful, and many development agencies, such as Asian Development Bank, ESCAP, Japan International Cooperation Agency, World Bank, World Customs Organization and World Trade Organization, have worked in this area.

Urban development

In order to ensure that twin cities grow as cities rather than outposts, urban infrastructures, including hospitals, schools and community facilities, must be a focus. Urban amenities allow labour force to be properly formed and integrated along the border, in providing workers with necessary education, health and recreation infrastructures. Similar infrastructure on both side of the border ensures that the attraction of twin cities for labour is not unilateral. Thus, labour forces would be optimally distributed in twin cities according to the repartition of industries around the border-crossing, rather than because of a disproportion in infrastructure on one side of the border. In addition, city planning is needed to integrate new urban developments and foster old city centres.

Industry development

Twin cities' economies sometimes lack infrastructures, knowledge and technology to grow complementary industries. Possible methods for promoting local industries include attracting FDI

through the development of SEZs to increase investment in infrastructure and technology and knowledge transfers. SEZs also allow companies to benefit from soft tax regimes and to be more competitive internationally. Implementing and managing SEZs implies strong coordination and knowledge and information exchanges between local authorities, SEZ developers and SEZ authorities to induce viability of the policy on the long run. Such agglomeration policies must relate to a previous assessment of competitive advantage, to drive the benefits of cluster-related spillovers to the appropriate industries. This also allow to create linkages between the cities and increase the inherent synergies and integration, rather than persisting in competitive attitudes between economies.

Labour migration policies

Efficient labour force formation on each side of the border is necessary for twin cities economies to be complementary and reach potential growth. Barrier to labour movement would prevent industries from reaching the needed level of skills in high-value added industries, or constraint business development in labour-intensive industries. Moreover, workers illegally crossing the border face high risks of legal retaliation and reject from the other side's labour market. It is also worth mentioning that inefficient border procedures for workers weight on commuting distance to work and weaken labour force mobility. Thus, policies to increase freedom of movement and procedures efficiency are a welcomed tool to favour labour complementarity of twin cities' economies.

Border control regulations

As twin cities expand and develop a prime consideration must be given towards offsetting the negative impacts inherent to increased border crossing movement. Human trafficking, smuggling, drug trafficking or HIV/AIDS pandemic are severe negative externalities arising from cross-border trade and movement of people liberalization. Thus, state and municipal actors must ensure the quality of trade and industry; seek the reduction of smuggling and diminish the development of black market through better knowledge of the border-crossing market ecosystem; and better control of issues associated with movement of peoples across borders, including human trafficking.

Social policies

Policies targeting social protection, healthcare and childcare are crucial to counteract possible negative effect of the twin cities phenomenon, such as widening inequality and gender issues. The differential effect of the twin cities across age and gender raises the need for social policies targeting the most vulnerable and those who benefit least from socio-economic changes and social reconfigurations. For instance, the implementation of healthcare systems, ideally similar across the border to avoid any labour movement, would ensure that the workers have access to health protection and do not have to rely on personal resources in case of incidents. Also, childcare services are crucial tools to fill the gender gap in employment, as women workers benefit from assistance and help in raising children while, still having access to jobs. In addition, policies protecting the demonstrations rights or structuring the relationships between employers and employees are powerful tools to soften the predominance of the opaque power of corporations over social spheres in twin cities.

Administrative collaboration

Since the studied twin cities have recently emerged as nodes for cross-border value chains, little official and administrative collaboration have been implemented by the local governments. Regarding official interactions, only annual meetings at the governor level are to be mentioned although not focused on strategic issue. More frequent but informal meetings at the working level exist for some collaboration (e.g., sharing office equipment) but depend on the personal relationship between officers. Given that the commonalities in culture, religion, language and history provide a channel for joint development, the twin cities have a deep interest in committing into common administrative, cultural and social projects through both formal and informal collaboration. Although the local authorities recognize the importance of such collaboration and wish to improve administrative coordination between the two cities, actual actions are still needed.

5. Conclusion: Cross-border twin cities as a potting soil for growth

Cross-border twin cities, as a symbiotic economic phenomenon, have vast potential for being integrated nodes along cross-border value chains, far beyond being sites of border trade. Cross-border twin cities are two urban centres that (i) are closely located across an international border, (ii) are accessible through transport and information networks and urban amenities, (iii) are subject to the structural reconfiguration of the border economies, economies of scales and a common integration into a cross-border value chains, (iv) facilitate the development of complementary industries through key policies shaping industries and facilitation trade and investment, and (v) collaborate at several levels in policies and projects.

Cross-border twin cities show great potential in clustering effectively SMEs and in fostering the development of cross-border value chains. Neighbouring countries can diversify and begin manufacturing products along more integrated cross-border value chains through cross-border twin cities. Such phenomenon is a crucial rationale for enhanced cooperation from the countries, as the cross-border twin cities' benefits spread across borders and imply opportunities for cross-border sustainable development.

Assessment on the status and impact of cross-border twin cities using the set of dimensional indicators is of importance for policy design and future research. Those socio-economic indicators would be crucial to understand the benefits and challenges of the twin cities phenomenon or the need for further development policies. For instance, an analysis can be implemented to assess the importance of both transport, ICT and urban infrastructures and associated services in cross-border development, using socio-economic data.

In order for cross-border twin cities to rise and thrive, it is essential to undertake appropriate policy actions. This study highlights seven policy areas to foster mutual socio-economic development across international borders. Those include: (i) data and ICT, (ii) urban development, (iii) industry development, (iv) labour mobility, (v) border control, (v) social policies and (vi) administrative collaboration. Overall, this set of policies must regard cross-border twin cities as urban organisms with strong connectivity to the economy and society of its neighbours across the borders.

The case studies have shown significant impact of twin cities on economic and social dimensions of sustainable development. Looking forward, additional efforts can still be made to consolidate the framework and the policy recommendations regarding the three dimensions of

sustainable development – in particular the environment and society. Inconsistent policy frameworks have left gaps in sustainable development. SDGs' good health and well-being (pillar 3) or gender equality (pillar 4) are among the dimensions for which twin cities does not yet show appropriate responses. Moreover, twin cities' impact on the environment (water, energy, land, etc.) remain under-studied. The authors wish the framework to be extended and further used in light of such environmental and social issues.

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