

The Role of Bonded Areas on Logistics in Low-cost Countries

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Abstract— Globalization opens new possibilities as well as challenges for firms in positioning their productions and sourcing. Many low-cost countries have established various types of bonded areas to attract export-oriented businesses with cost advantages and pro-business policies. As many international firms have moved their operations or key supplies to these areas, bonded areas have been playing critical roles in their supply chain management. Taking China as an example, our study explores the role of bonded areas and highlights the potential drawbacks of bonded areas for international firms. Thirteen respondents with experiences in bonded areas have participated in the study. Policy implications for both international firms and policymakers of low-cost countries are discussed as well.

Keywords— Bonded area, low-cost countries, globalization, China, export-oriented firms

1. Introduction

With increased globalization and offshore sourcing, global supply chain management is becoming an important issue. Firms are operating in multiple locations, having an array of global suppliers, and serving customers around the world. Multinational corporations (MNCs) are increasingly buying from suppliers in low cost countries or moving their operations to these countries. As globalization gives them the option to locate the activities of their value chain in the best sites in the world, it is critical for managers to make decisions with good understanding on potential challenges. While the purchasing or operating challenging is well recognized in the international business literature [e.g., 1, 2], logistics issues are often considered only after the actual sourcing or operation begins [3]. Kumar et al. [4] reported that MNCs do not explicitly take logistics into account during their sourcing decision and called for a more integrated

bonded areas, and explores its impact on MNCs' operations and supply chain performances in these countries.

Bonded areas are established by many developing countries to attract foreign investments and protect domestic industries at the same time. As most developing countries are eager for foreign investments and economic growth in the current globalization tide, they open a few strategic locations with favourable customs regulations and pro-business policies to attract the investments from MNCs. At the same time, facing domestic pressures or still uncertain of the impact of opening the whole national economy, governments use these bonded areas as testing beds. Moving products out of the bonded areas to the country is often more difficult than moving them out of the country due to the customs regulations. While the strategic locations of bonded areas and pro-business policies inside have made them key nodes of supply chains for MNCs, the potential logistics costs in these areas can be challenging to manage. Some MNCs in their search for cost advantage may take too narrow a view of cost and experience a higher total cost when the costs of longer supply pipelines outweigh the production cost saving [5]. This study on bonded areas is thus timely for the field of logistics in developing countries with implications for both MNCs and governments of developing countries. It would help fill a gap in the logistics literature.

To be more focused in this study, we take China as the research context as it is the largest developing country and the manufacturing hub of the world where bonded areas are growing rapidly. Being the factory of the world, the bulk of products in global industries sold on the global market such as electronics are made or assembled in China. The nature of these products, high in design value but low margins for production and assembling, makes the bonded areas the natural production and distribution locations. With the development of the Western inland regions, many MNCs have moved inland and extended their China supply chains significantly, resulting in significant volume increases of bonded goods movement

across the different bonded areas. It is reported that companies have often experienced difficulty and delays in moving their goods out and between the bonded areas, and in turn the responsiveness of their global supply chain is severely affected. In response to these concerns, our study explores the role of bonded areas in China and highlights the potential drawbacks of bonded areas for MNCs. Policy implications for both MNCs and policy makers of low-cost countries are proposed and discussed.

This paper is organized as follows. The literature on bonded areas is reviewed first. We then examine the current practices and highlight several issues in the bonded areas operations. Policy implications are then presented, followed by conclusions.

2. Operation of Bonded Areas

2.1 Overview of bonded areas in China

Knowing the benefits of foreign investment to the economic growth and development, many developing countries have used various policy incentives to attract the direct investment of MNCs. One common approach is to establish a number of Special Customs Surveillance Areas, commonly known as bonded areas. In China, the bonded areas are approved by the State Council and monitored by the General Administration of Customs (GAC). They are developed with three key objectives, to build platforms for international business, to be the engine for industrial agglomeration and regional development, and to build logistics and port facilities in strategic locations to be key nodes for MNCs' global supply chain.

The bonded areas can also have an agglomeration effect for logistics industry as their integrated functions of logistics services can attract a large number of well-known third-party logistics firms (3PLs) as well as manufacturers and traders who require reliable logistics support.

There are four main types of bonded areas: free trading port areas (FTPAs), integrated free trading areas (IFTAs), export processing zones (EPZs), and bonded logistics parks (BLPs). Table 1a and 1b presents the policies and functions in the bonded areas in China.

Currently, most bonded areas are located in the coastal areas. However, to support the development of the inland regions, more bonded areas have been approved and established in Central and Western China in line with the government's program for Western development under the Great Western Development Strategy. The location of the major bonded areas (IFTAs, FTPAs, EPZs, and BLPs) in China is presented in Figure 1.

Features	FTPAs	IFTAs
Export tax rebate	Yes. Entering goods is considered as exported.	No. Rebate is available when goods are exported.
Customs	Managed by a single customs.	Port and the bonded area are managed by two separated customs.
Port	Inside the bonded area	Not inside the bonded area
Trading and logistics firms	Allowed	Allowed
Manufacturing firms	Allowed	Allowed
Container value-added services	LCL consolidation, transshipment and others.	Not available
Multi-modal transportation	Yes	Not available

Table 1b. Policies and functions in bonded areas (continuous)

Features	EPZs	BLPs
Export tax rebate	Yes. Entering goods is considered as exported.	Yes. Entering goods is considered as exported.
Customs	Port and the bonded area are managed by two separated customs.	Port and the bonded area are managed by two separated customs.
Port	Not inside the bonded area	Possible to link with port by a logistics channel
Trading and logistics firms	Not allowed	Allowed
Manufacturing firms	Allowed	Not allowed
Container value-added services	Not available	LCL consolidation and unloading, limited transshipment services
Multi-modal transportation	Not available	Limit to water-road

Note: LCL refers to less than container load.

Table 1a. Policies and functions in bonded areas

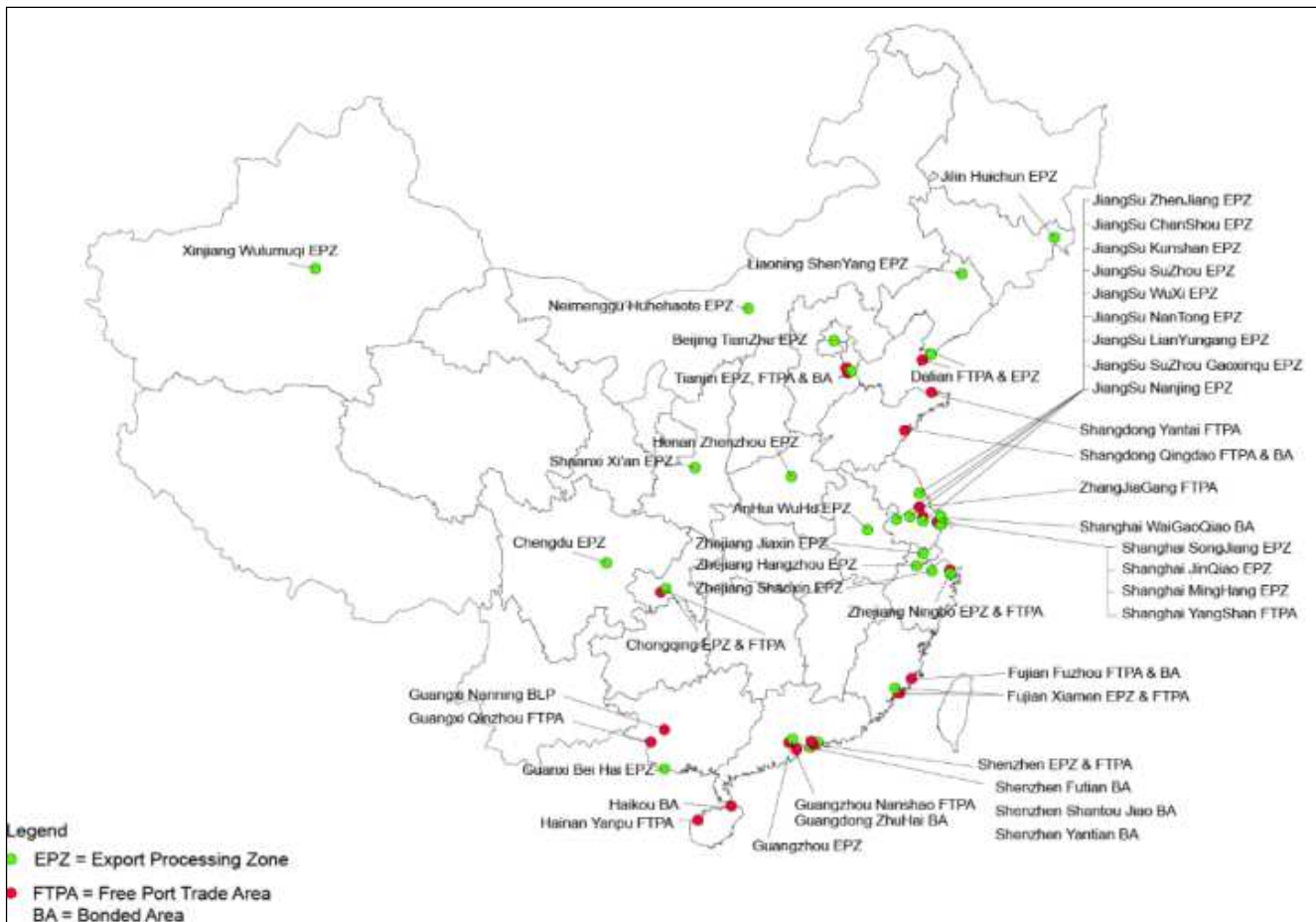


Figure 1. Locations of major bonded areas in China

(Source: *2011 China Free Trade Zone and Export Processing Zone Yearbook*)

2.2 Global practices on bonded area operations

From the definition of the bonded area, goods moving into or out of are counted as exports or imports subject to possible tariffs and duties, but moving goods from one bonded area to another one is duty-free. To suspend the payment of related duties or taxes for goods leaving a bonded area, customs have to track the movement of the bonded goods across the different bonded areas to ensure its movement to the declared location. Thus tracking the movement of bonded goods by customs is a common requirement in most countries. Many developed countries have established a robust customs operating procedure capable of 24 x7 operations to serve companies better.

However, it would be troublesome for customs to track every movement of goods in every bonded warehouse physically in daily operations even under a 24x7 operation. It may exhaust the limited manpower and other customs resources given the sheer volume of bonded goods. On the other hand, the declaration and checking processes can be troublesome for manufacturers and 3PLs if they have to declare each bonded goods movement.

Thus it is a common practice for customs to ask the goods owner, either the manufacturers or 3PLs, to share the burden of goods tracking. Concerning the huge duty or tax revenue loss if the goods owner were dishonest, customs rates companies into several categories according to their capabilities and compliance records, and gives trustworthy companies more privileges such as fewer customs reporting and inspections. It improves the efficiency of customs processing for goods from large companies with good track records. With a good IT infrastructure, many customs also use online reporting and book checking to replace traditional hardcopy reports and physical on-site inspection.

In the US, the movement of bonded goods is also governed by customs. According to US laws, bonded warehouses can be used to store all merchandise subject to duty except for perishables and explosives. While the warehouse can be either public or private, full accountability for all merchandise entering a customs bonded warehouse must be maintained. The merchandise will be inventoried and the proprietor's records will be audited on a regular basis. Bonded merchandise may not be commingled with domestic merchandise and must be kept separate from other merchandise. Merchandise held in bond may be transferred from one bonded warehouse to another in accordance with the provisions of customs regulations.

In the day to day operations, US Customs also differentiate firms according to their track record and capabilities. Taking its cargo security program C-TPAT (Customs-Trade Partnership Against Terrorism, a program initiated after the terrorist attack of 11 Sept 2001) as an example, it has given participating firms advantages such as the reduced number of customs inspections, resulting in reduced border delay times. Though firms have to invest significant effort to be certified, the literature suggests that most participating organizations have benefited from C-TPAT certification through border inspections, lower costs, and higher customer satisfaction. These firms also reported improved relationships with their supply chain partners and better security among international partners [6].

In the European Union which has separate customs administration, the treatment of bonded goods is also an important area for trade facilitation. There is a pan-European e-Customs Initiative which enables traders to use a uniform Internet portal and thereby the possibility of simple access to all provisions and procedures in one location without the involvement of the different customs authorities [7].

3. Methodology

As research is scant on this topic, a qualitative approach is taken. A semi-structured interview gives respondents the freedom to share experience and opinions, but at the same time provides focus and scope on the discussion. We thus mainly rely on the semi-structured interviews for first-hand information from people at the management and operation level. Open-ended questionnaires are also used for feedback from the managers located in China. We interviewed representatives from companies in Singapore and phone-interviewed several experienced managers and government officials in China. In addition, some companies participated in the study through written questionnaires, and we have thirteen responses in total. We have also searched both English and Chinese secondary sources for supplementary information.

The thirteen participants can be divided into following four groups:

- Two large multi-national manufacturers with significant operations in China in the high-tech sector. Their suppliers or products are often subject to high customs duties and as such have to be moved as bonded goods in China for processing or distribution.
- Three multi-national logistics service providers (3PLs) operating in China. They normally serve MNCs operating in China with greater coverage over the various provinces in China and multiple industries.
- Four domestic 3PLs in China. They normally focus on a few locations to serve both domestic and

international firms in China. Some of them also subcontract for foreign 3PLs with their strong local networks. They have more local knowledge and are more familiar with Chinese customs rules and regulations, both written and unwritten.

- Four management officials of the bonded zones including customs officials. From the perspective of the operators of the bonded areas, we can eke out a better understanding of some of the current practices.

4. Management of bonded goods movement in China

4.1. Current practices on moving bonded goods in China

In the context of China, Chinese laws require companies operating in bonded areas to apply to customs for permission to move bonded goods between the different bonded areas and for import /export. For example, Samsung has an electronics product distribution centre in the Suzhou IFTA which provides international and domestic distribution services which link it to other bonded areas in China. Next, the supply chain of Apple includes products such as the iPad, which consists MNCs such as Samsung, Broadcom, LG, Amperex, Infineon, Texas Instruments, and Foxconn Electronics as the main assembler¹ [8]. While these firms are headquartered in different continents, most of the components are believed to be shipped from their factories or distribution centres in China to maintain the supply chain as efficient as possible since the final assembly of Apple products are done in China. As the final assembly of iPad is done in Foxconn's new Chengdu factory [9], and we would see the movement of supplies from the various locations in China to Chengdu, which may include the movement of Samsung's flash memory from the Suzhou IFTA to Wuxi Airport by bonded trucks, shipped by domestic flight to Chengdu Airport, and then transferred by bonded trucks to Foxconn's factory, an EPZ in Chengdu. Similarly, Amperex Technology's battery may be shipped from its factory in Guangdong Dongguan (most likely an EPZ) to Guangzhou Airport by bonded trucks, shipped by domestic flight to Chengdu Airport, and then transferred by bonded trucks again to Foxconn. The supplies from the other companies use similar truck-air-truck processes.

After the assembly and testing, the final products are then shipped by bonded trucks to Chengdu airport first and flown to the final international destination. But they

¹ The list of Apple suppliers is not official as Apple bars its suppliers from publicly talking about their relationships. Researchers rely on teardowns to identify the major components of Apple products and their suppliers. The exact shipping locations of supplies are also not sure but we assume they are from the main China DC of relevant suppliers.

may have one more transit in another Chinese city such as Shanghai for consolidation with other cargo.

Going by this example of two suppliers and the final product, the iPad supply chain requires 10 “moves” through customs. Given the hundred or so suppliers of the iPad, the real interaction with customs can be in the thousands. The movement of selected bonded goods for Apple’s iPad is presented in Figure 2.

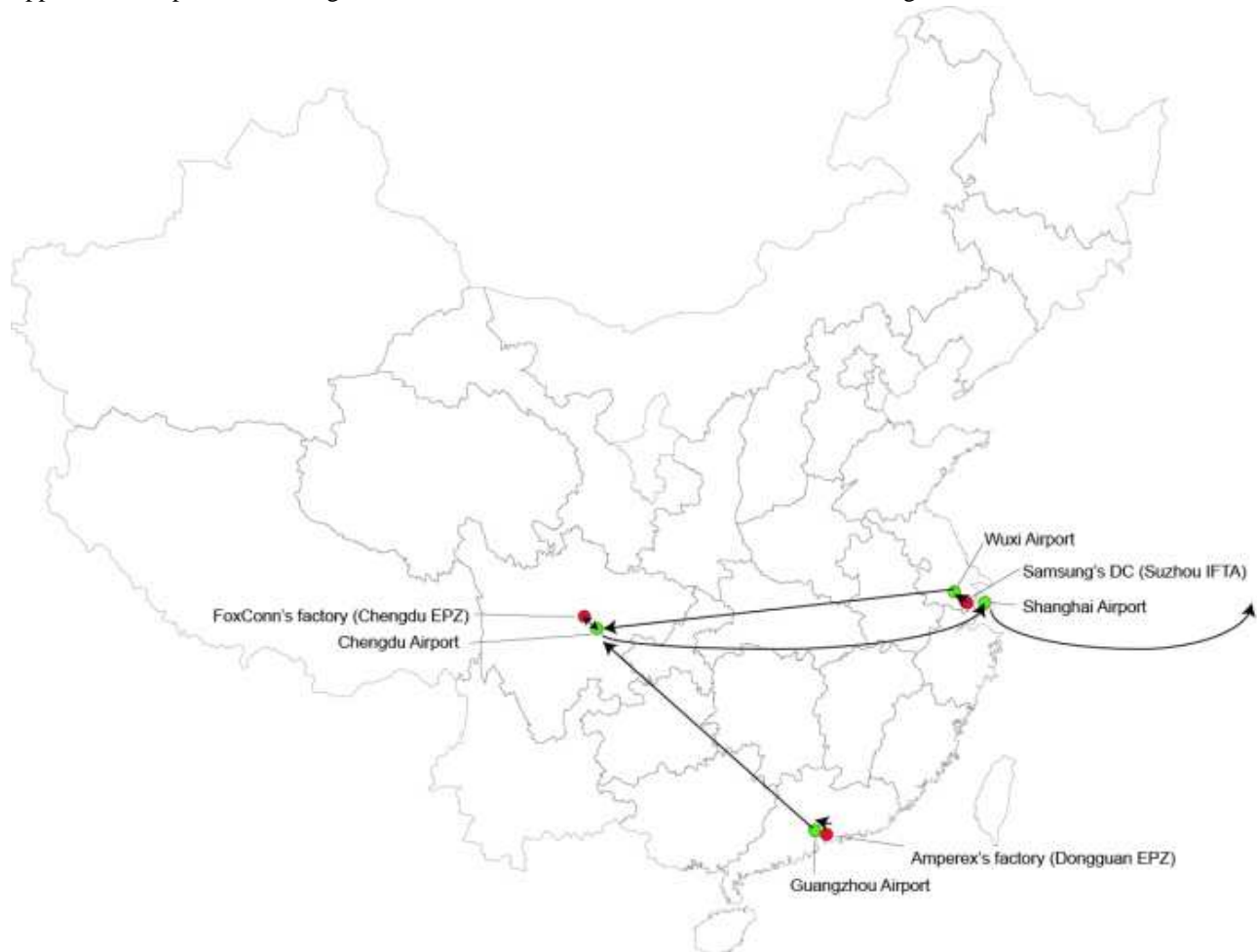


Figure 2. Selected supplies’ movements for Apple’s iPad in China

In general, China Customs do not collect duty and value-add-tax (VAT) on the bonded goods imported under export processing contracts according to Chinese laws. China Customs will collect duty and VAT if the bonded goods used in export processing remain in the country after the permitted one-year grace is over. Since some firms involved in export processing can import goods without the payment of duties and taxes, they need to pay a security deposit for the importation of bonded goods. The bonded goods are thus under customs supervision throughout the permitted period in China. A firm can apply for the lifting of customs supervision over the bonded goods after the goods have been re-shipped out of China or payment of import duty and VAT, to turn the bonded goods into general import-export goods. Customs would verify the claim preceding the lifting of customs

supervision over the bonded goods. The firm can redeem the security deposit afterwards.

Currently, China Customs has established a national system and procedure for the movements of bonded goods between bonded areas. Similar to other developed countries, manufacturers with import /export businesses and 3PLs are categorized into 5 classes, from AA, A, B, C, to D according to their track record and firm size.

Firms in a higher class would enjoy more preference treatments in moving bonded goods such as less on-site physical check and lower security deposits. For example, “AA” or “A” class firms can benefit from “local declaration and port clearance” which would expedite the customs processing for their goods. Firms in the “AA” class would further enjoy preferential policies and services such as no special bank account required for processing the trade business and unrestricted import and export goods releasing based on guarantee letters. These measures save time and money for the companies, and at the same time reduce the customs clearance costs.

On the categorization of foreign firms, manufacturers are categorized by firms as an MNC would be treated the same in each province. But 3PLs are categorized by provinces, and the preference for 3PLs is less than manufacturers in general. Global 3PLs such as UPS and DHL have to apply for preferential treatment individually in each province. According to a senior official of a global

3PL, it may not be a disadvantage as one bad local event would not affect the entire operation of the firm in China.

Overall, it is recognized that China Customs have improved significantly after the WTO entry. They now largely follow international practices, and are more transparent. Some local customs are also efficient at the operations level. In the Suzhou IFTA, the customs processing time for normal imports, exports, or transits is about 3 minutes per batch where the paper declaration can be done before or after the goods pass customs. The on-site physical checking time is about 20 min per batch if the customs officers decide to check the goods.

However, many MNCs feel that the procedure of moving bonded goods across China is still burdensome as it delays goods movements significantly, which force MNCs to take much longer time to deliver to customer's destination than direct shipping by truck or air. Nonetheless, they are still relocating and extending their supply chains. For example, Intel relocated its Shanghai production lines to Chengdu in Sichuan province and now half of its chips produced worldwide are tested and packaged in the Chengdu plant. HP's Chongqing facilities began operations in 2010 to assemble computers for both the Chinese and global markets [10]. Moving bonded goods in such a vast region would pose a great challenge to their supply chain management while China Customs have been struggling to catch up with international best practice as well.

4.2. Problems in moving bonded goods in China

Our field study shows that there are still some problems in the operations of bonded areas which affect the effective movement of bonded goods in China. They are summarized into the following five categories.

4.2.1 Lack of national regulations on bonded areas

According to the interviewees in Guangxi and Hainan, the legal status of bonded areas is not clearly defined and regulated by national legislation. The management committees of the bonded areas are normally branches of provincial or municipal governments while the bonded areas are regulated by national laws, ministerial regulations as well as provincial rules. As a result, the bonded areas in different provinces are often managed under different provincial rules and with different management modes due to the lack of a well-defined legal status. As firms often operate in multiple bonded areas, their operations could be regulated by inconsistent or even conflicting rules, resulting in confusion in the movement of bonded goods through different provinces.

Another problem is the lack of standardization on important procedures at the national level. While China

Customs have worked hard to issue many new regulations after the WTO entry, many older regulations need modification to cope with the significant changes in the supply chain landscape. One example is the moving of bonded goods by the domestic air network. The existing procedure on bonded logistics is based on goods moving on bonded trucks, which was dominant ten years ago when most MNCs operated in the coastal area with limited connection to other locations in China. The movement of bonded goods was largely restricted to the movement between the bonded area and the nearby sea or air ports by bonded trucks. The provincial authority could coordinate the movement well as both customs branches were under its administration. However, with the rapid expansion of China's supply chains by many MNCs in the past decade, cross-provincial bonded movement is widely employed. As high-tech products are typically high value albeit small volume, shipping by air is a more reasonable choice for the MNCs. However, there is no customs facility in most airports for domestic flights. A senior manager in a global 3PL gave following feedback,

Moving bonded goods by air is do-able but the procedures are harder than road transportation. You have to get two customs to discuss the issue. It is a one-time arrangement and case by case for the processes. Both sides need to sign an MOU for it.

Another manager of a high-tech MNC shared the same concern as he mentioned,

No clear existing regulation, guidelines, and processes for moving bonded goods via China's domestic air network is one key area that we believe the government agencies can improve to make bonded goods movement faster and more efficient.

4.2.2 Variations in policy interpretation and implementation

Though customs policies are enacted by the GAC, customs in the provinces may have their own understanding and interpretation. Such differences may reduce the full impact of the policy benefits, and even adversely affect firms operating in the bonded areas. It is reported that the movement of bonded goods is much more efficient in the same province due to identical policies, regulations, and operating rules. Based on interviews with the managers of bonded areas in Guangxi, Jiangsu, and Hubei, the differences in the interpretation of strategic level policies would lead to variations in the implementation details of these policies at the provincial and state levels. As told by the domestic 3PLs, these variations have caused inefficiency in the movement of bonded goods between provinces since companies have to

follow multiple and even conflicting operational rules on the ground. A senior manager of a 3PL, located in Jiangsu but with operations in Chongqing, Chengdu, and Xi'an, mentioned that the company had to employ dedicated staff or even setup an office to deal with these issues in some bonded areas. A senior manager in a global 3PL gave following remarks,

There are variances on regulations interpretation between customs officials in different locations. For example, the same goods may be categorized and valued differently by two customs. Then you need to spend time for the two sides to reach a consensus. If customs and shippers hold different views on goods valuation, you have to start a negotiation process for an agreement.

Besides the variation in rules, some beneficial policies are not well implemented. For example, materials entering the bonded area are considered as exports, and firms should enjoy tax rebates for the consumption of all local materials including water, electricity, and gas. However, it is required to declare per batch or per order in some bonded areas, which makes the declaration cost higher than the tax rebates, and the clearance process of bonded goods at customs is costly and time consuming [11]. As commented by one 3PL operating in Guangxi, there are no dedicated customs officers for rebate processing in some newly established bonded areas and the rebate claiming process is troublesome and difficult. To claim the tax rebate becomes a value-adding service of the 3PL.

Furthermore, a recent shift in China's macro-economic policy may affect the movement of bonded goods also. With the rapid increase of trade surplus and foreign exchange reserves, policies have gradually shifted from attracting foreign direct investment (FDI) and boosting export-oriented industries to slow export growth, encourage certain imports, and discourage FDI in areas inconsistent with the long-term development goals [12]. As a result, China Customs have issued various export-related rules and regulations to reduce incentives on some export-oriented industries, discourage the expansion of these industries, and boost customs revenues at the same time. Independent third-party auditors are employed to perform compliance audits, and processing-trade enterprises have to seek customs approval before moving goods to other manufacturers [13]. Knowing that some foreign firms had benefited from the lax application of regulations in the past, China Customs have been strict on enforcement in recent years and generated huge duties thereby [14]. Such a policy shift would lead to stricter customs supervision on bonded goods. When many MNCs have called for the extension of post-declaration procedures, one senior official in a global 3PL gave following commented,

As for post-declaration, it is applicable to the whole country but not under the current category system (from AA to D). The requirement is so high that very few companies can qualify. When China Customs are encouraging firms to apply for the status, it is highly risky for customs due to the many irregularities by foreign firms in China. There is a high suspicion of foreign firms for under-declaration or using other approaches to lower taxes.

4.2.3 Operational inefficiency of Customs

Besides the rules and regulations, China Customs' operations are still weak in practices. Complex and vague clearance procedures have an adverse impact on customs efficiency. An advanced and connected information system will help streamline and improve the monitoring, checking, and clearance processes of bonded goods.

In addition, although a standard customs information system, developed by the GAC, has been installed in most customs branches, there still exist variations in the information required by the local customs, especially for transiting goods, based on feedback from a customs officer in Guangxi. Moreover, most information is uncomputerized and not shared among customs in different locations. The current information system in most local customs branches does not support the online connection of multiple terminals, which is essential for goods visibility, auto approval, and post-declaration as suggested by some MNCs. A senior manager in a global 3PL gave following observations,

At the operations level, the reconciliation process on shipping information between two customs is very time consuming. While it is ideal to develop a new national online system, local customs are not eager to upgrade their systems due to the conflicts of interest as their current systems have been largely outsourced and managed by related external parties. They would have lost business if customs changed the systems.

Labour shortage is also an often quoted reason for customs inefficiency. Existing customs officers cannot meet the increasing demand due to the rapid expansion of the bonded areas and increasing cargo volume. A 3PL operating in Jiangsu and Shanghai said,

Labour shortage is quite common due to the expansion of customs operations, which often cause delays in customs processing and inefficiency of the bonded goods movement on both lead time and cost.

Moreover, the qualification of the customs officers is below the requirement. People with good education and experience in customs operations practices, especially with a sound understanding on international practices, are in high demand.

Further, the short operations duration in some customs is also a bottleneck for the movement of bonded goods. While some customs work 7 days /week and 24 hours /day in Shanghai and Suzhou, it is not so in most inland cities as commented by the domestic 3PLs.

4.2.4 Low utilization of many bonded areas

The economic success of a bonded area is determined by the viability of the firms operating in the area, which in-turn requires sufficient cargo volumes. However, most bonded areas in China are under-utilized and operate below the designed capacities, resulting in low profitability and intense competition among the bonded area operators [11].

Industrial duplication and over development are found to be two major reasons for the low utilization of many bonded areas. Many bonded areas are similar in function and industry type, and most EPZs focus on high-tech ones as the major industries. The similarity of industries among the bonded areas results in intensive competition. Many bonded areas often compete with one another through attractive concessions such as cheap land and extension of tax holidays. Such competition results in the significant loss of tax revenues [11].

Over development refers to the over development of the bonded area compared to its surrounding regions. One official from a bonded area in Guangxi said,

Cargo volumes in the bonded areas in the Central and Western China are still low due to the underdevelopment of the surrounding region. The establishment of trading, logistics and export processing businesses has not yet generated sufficient demand. How to increase cargo volumes is very challenging for the managers of the bonded areas.

Our interviewees also noted that the service capacity and quality of 3PLs in these areas are often below the expectation of the MNCs, which affects potential cargo volumes. Even in the more developed provinces such as Jiangsu, the utilization of logistics facilities in the bonded areas is still low due to the newly established bonded areas and the upgrading of existing ones in recent years. One senior manager of a 3PL in Jiangsu said,

The competition among the bonded areas is very intensive. There are about 20 bonded facilities in an area within 200km of Suzhou. However, the demand for bonded logistics is increased slowly. We are often asked by managers of the bonded

areas whether we want to rent their bonded facilities.

On hindsight, the establishment of bonded areas should be better planned and coordinated among the various ministries and provinces. The low utilization of a bonded area would reduce the trucking frequency of the 3PLs and lower the service quality in bonded goods movement. It may also be one reason for the inadequate customs services in some inland areas as one senior manager of a global 3PL mentioned,

The business volume in some inland locations is an issue also as customs do not have sufficient volumes to justify the long operating hours or system upgrading.

4.2.5 Low financial contribution of bonded areas to local government and neighboring regions

Although the bonded area benefits the development of its neighbouring region in the long run, the direct financial contribution of the bonded area is currently very low. From the perspective of the local government, the income from a newly established bonded area is often lower than the expense. A director of the provincial Economy Development Bureau in Central China made the following comments,

To develop the bonded area, the government has to invest heavily and bear a high initial cost. In addition, it still needs to invest on the management and maintenance down the road.

Even in the more developed regions such as Suzhou, the contribution of tax revenues is also quite small due to the various incentive policies, and most income derived from the bonded areas are personal income taxes.

Next, the bonded area is not well integrated with the surrounding region. Most domestic firms operate outside the bonded area, and seldom use facilities in the bonded area. The bonded area's connection with the regional economic development is still not intimate [15]. Some bonded areas operate like enclaves. An executive director of the Management Committee for a bonded area in Western China made the following observation,

For the bonded area, the integration of the logistics, processing, and trading functions still takes time. Externally, the area is not well-integrated with the neighbouring regions, and has very limited spill-over.

At the operations level, 3PLs operating inside the bonded area are often not well coordinated with partners outside the area, and the information system for logistics within the area is often not compatible with the system used by the external logistics firms, resulting in poor information sharing between firms.

5. Implications & Discussions

Based on our study on the movements of bonded goods in China, we summarize the implications into two groups, to governmental policymakers, both in China and other low-cost countries with lots of bonded areas, and to multinational firms (both 3PLs and manufacturers) operating in bonded areas. Some of them are long-term solutions which require political wills of central government while others are more medium-term in nature and can be implemented quickly.

5.1 Implications for policymakers

5.1.1 Improving customs regulations

In China and other low-cost countries with lots of bonded areas, policymakers could improve laws and regulations on bonded areas by developing more consistent regulations. For example, many customs policies and regulations in China were implemented decades ago. A major upgrading is required to match changes in the past decades. While currently a lot of new customs rules and regulations are been issued in China [12], such changes should focus on not only industry shifting and revenue boosting but also better service to MNCs in China. In particular, a standard procedure for the moving bonded goods by air would improve the customs efficiency significantly. It could help the regional development and boost customs revenues in the long run.

Furthermore, better coordination among various ministries and bureaus would be essential for more effective regulations on bonded areas. Taking China as the example, related ministries including the GAC could work together with the Congress to enact a law for a clearer and more consistent legal definition of the bonded areas. Moreover, given the current variations in the existing policy interpretation and implementation in China, better communication across various ministries and state bureaus could help to facilitate the efficient movement of goods between bonded areas.

5.1.2 Improving planning and joint development of regional bonded areas

Noting many existing bonded areas in China are not well utilized and often compete instead of collaborate with one another, policymakers could improve the overall planning of bonded areas and encourage the joint development of multiple areas in one region. The approval and establishment of bonded areas should be mainly based on the market needs for long-term economic growth, not for short-term political goals.

Moreover, policymakers could encourage the joint development of bonded areas in strategic locations such as seaports and inland ports among neighbouring provinces.

Such effort could also help the integration between bonded areas and surrounding regions. Policymakers from neighbouring provinces can plan the development of bonded areas collaboratively, jointly promote focused industries in these areas, and have regular meetings to deal with various issues.

5.1.3 Promoting customs-business partnerships

It is known that building customs-business partnership (CBP) is one common approach among developed countries for more efficient and effective customs operation [16]. To make CBP successful, the process is the key. The two parties need to first forging initial agreement. Customs and MNCs should first negotiate and agree on a broad purpose, mandate for each party, resources commitment, decision-making structures, and so on. Then the process is followed by some form of approval, such as the issue of a license or permit through a form of certification. In the China context, the new customs clearance mode, Local Declaration Port Clearance introduced in 2006 [17], can be a basis for the CBP program. This mode of clearance allows firms to make the customs declaration to the territorial customs and go through the clearance procedure at the customs where the import or export goods are released. It benefits participating firms by time saving in the clearance procedures and logistics cost reducing. However, at the customs side, they need to extend the clearance mode to be an open, transparent program and willing to adjust for mutual benefits. Leadership and political will is essential for its success.

To create more public value from the CBP program, we suggest an extension of the program scope to all customs of bonded areas in addition to existing ports for imports and exports. In the context of cross-province movements of bonded goods, applying "local declaration and port clearance" could save MNCs and their 3PL partners a lot of time and effort from double declaration and clearance at two locations.

5.1.4 Improving customs efficiency

Various domestic and international better practices can be implemented to improve the customs operations in China and other low-cost countries. At national level, the interfaces among customs branches in different provinces should be more standardized. Communication among multiple customs officers should be more effective to improve the efficiency of moving transiting bonded goods. More collaboration programs should be established to facilitate cross-province information system integration and customs rules and practices standardization. One example could be the extension of the Shanghai Easy Pass System, a Shanghai version of green channel processes of

moving bonded goods to Jiangsu and other provinces. Collaborating mechanism between multiple customs branches in a region could facilitate regional integration on customs operations processes and procedures.

At the technical level, China Customs can use advanced IT technologies to improve the surveillance on bonded logistics. Customs could establish network connections with firms so that information on the movement and storage of bonded goods can be accessed and monitored at the real time and hence speedup the customs clearance of bonded goods. Furthermore, customs can improve its surveillance capability by more effective risk management. Based on the historical records and credit evaluation of the enterprises, customs can improve its surveillance by rating companies differently to use its limited resources more effectively.

5.2 Implications for 3PLs & Manufacturers

First we discuss the implication for 3PLs in low-cost countries. After knowing difficulties in moving bonded goods, a 3PL could build up its capabilities as well as forge constructive relationship with customs and clients to improve its competitive advantage in the field.

5.2.1 Improving service capabilities and provide more value-adding services to clients

For a 3PL, difficulties could be business opportunities. Knowing the complexity of rules and regulations on bonded areas, a capable 3PL can actually differentiate itself from competitors by providing timely and effective customs-related services to its MNC customers such as efficient goods consolidation and fast claim of tax rebates. The 3PL should also be capable to solve the conflicts of its customers with other domestic firms or government agencies for their benefits.

Knowing many bonded areas are operated under capacity, a 3PL operating in only one location is difficult to reach the economy of scale. It has to establish a broad service network across the country, which would enable it to provide value-adding services for clients whose operations are often not limit to one location. It is important for the 3PL to establish a broad logistics service network covering multiple cities in several provinces. Its operation in each city should fully adapt to local operations environment with good local knowledge and connections. Such a broad network would help form efficient linkages between multiple bonded areas and facilitate goods consolidation and international transshipments.

5.2.2 Building constructive relationships with customs and local governments

Good relationship with customs and government agencies is important in any country, and is especially so in China. A 3PL must build efficient and close working relationship with local customs branches in bonded areas, and fully understand both national and provincial regulations as well as implementation details. It also needs to have good relationship with local governments. As mentioned above, participation in CBP programs may contribute to the relationship building as well as value-adding to clients. The 3PL should maintain good compliances records with customs, meet related customs requirements, and make it qualified for "local declaration and port clearance". One senior manager in a global 3PL made following statement,

In real day-to-day operations, the relationship between firms and customs are important. We need to hire locals and attend customs briefings regularly to facilitate the communication.

Technically, a 3PL should establish a compatible IT interface with various local government agencies including the management committees of bonded areas as well as national ones such as the GAC. It would be beneficial to build effective connections with government agencies for information on policies and regulations. Actually, In Suzhou IFTA, 3PLs are required to establish a link to government sites for information updates and financial reporting.

5.2.3 Adjusting supply chain networks

For MNCs operating in low-cost countries such as China, in responding to difficulties of bonded areas operations, besides engaging capable 3PLs as partners and building constructive relationships with customs, they need to adjust their supply chain networks for operation efficiency.

While many MNCs move to inland China to lower their operation costs, it is important to know their total supply chain costs after the relocation. While the cheap land and labour force would reduce the operation costs of MNCs, the extended supply chain would increase the related supply chain costs. For high-tech firms like electronics manufacturers, the increase of supply chain costs is not only the direct cost for goods transportation, but also the longer time spent on the goods movement. For high-tech products, the responsiveness of the supply chain is one critical factor and the firm has to weigh between the efficient and responsiveness carefully. An MNC planning to move to Western China must examine its overall supply chain carefully before making the move.

In particular, for a high-tech manufacturer of end products such as Apple, it should be aware of the significant expansion of its supplier network and the associated loss of chain responsiveness. As Figure 2 has shown, when Apple's final assembler Foxconn moved

from Shenzhen to Chengdu to reduce the assembling cost, hundreds of suppliers have to bear extra shipping costs and longer lead times. The MNC should be careful in making the "Going West" decision as it affects supply chain performance significantly.

On the other hand, a high-tech supplier which supports multiple MNCs in China needs to adjust its facility locations for its customers. When there are many high-tech MNCs moving to the West such as Foxconn and HP [10], the supplier has to follow its customers and move to the West too. By locating closely with major customers, the firm could improve the supply chain performance by reducing the transportation of bonded goods across different bonded areas. As there may be large numbers of MNCs remaining in the coastal areas, it is advisable for the supplier to establish two distribution centres in China, one in the East (Yangtze Delta) or South (Pearl Delta) and the other in the West (Chengdu or Chongqing area).

6. Concluding remarks

This study explores the role of bonded areas in low-cost countries and highlights the potential drawbacks of bonded areas for international firms. Taking China as the context, we find that there is a lack of national regulations on bonded areas, and there are significant variations in policy interpretation and implementation as well as operation inefficiencies in customs and bonded areas.

With the establishment of many new bonded areas in Western China and the "Going West" movement of the high-tech MNCs, the volume of bonded logistics is expected to increase significantly in the next decade with more production of bonded goods inside China and more transfer of the bonded goods. Bonded logistics would have a stronger impact on the MNCs' supply chain performance. High-tech MNCs and their logistics service providers have to be more proactive in managing their bonded goods movements. They have to understand the existing environment, establish a supply chain network balancing the requirement of cost and responsiveness, and build a close and constructive relationship with customs in all their locations. While customs has improved significantly since the WTO entry, it still takes some time for a more consistent and standardized national regulations and procedures to prevail across all customs branches for the management of bonded logistics effectively. The MNCs and their 3PL partners have to work with China Customs for an effective and robust trade facilitation regime. At the same time, they have to consider the current constraints when organizing their production and logistics facilities. For high-tech manufacturers, they should be aware of the significant expansion of its supplier network and the associated loss of chain responsiveness. While it is traditional for many MNCs to establish at most one distribution centre in any

country, it may be optimal to establish a second distribution centre domestically. Operating in China and similar low-cost countries requires new paradigmatic thinking.

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