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Rise of Cross-border E-commerce Exports in China

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Abstract

China's cross-border e-commerce industry has demonstrated stable and rapid development thanks to the implementation of appropriate policy support and the progressive establishment of e-commerce platforms. The industry's prosperity suggests unique advantages of cross-border e-commerce, which are a result of promoting industrial transformation and accelerating economic restructuring. Due to asymmetric information and insufficient data, little research has been conducted on the current status and the trends of the industry as well as the magnitude of risk in cross-border e-commerce. Using the cross-border e-commerce hosting service database of BizArk, the present study has constructed an index for China's export e-commerce prosperity and magnitude of risk which reveals that the industry: (i) generally presents a tendency of solid growth; (ii) has had a relatively stable situation for logistics facilitation but a drastic fluctuation in customs facilitation; (iii) has gradually shifted to competing for cheaper and more efficient marketing techniques as well as channels; and (iv) has experienced a remarkable amelioration of risk magnitude.

Key words: cross-border e-commerce, export trade, prosperity monitoring, risk forecast
JEL codes: F17, F23, F44

I. Introduction

The term "cross-border e-commerce" came into existence around a decade ago. Cross-border e-commerce today is quite difference to the international electronic trade discussed, for instance, in Bradley et al. (1999) and Afuah and Tucci (2001), as its key function has shifted from exhibiting information of online sellers and buyers to fulfilling

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online exchange of funds (Terzi, 2011; Lai and Wang, 2014). Cross-border e-commerce is a novel source of trade, which has developed with the spread and advancement of the Internet. Cross-border e-commerce involves international business activities executed by trade entities belonging to different customs territories, with transactions concluded and payments settled through e-commerce platforms, and goods delivery relying on the international logistics system. Discretionary trading between enterprises is facilitated in terms of information flow, fund flow and commodity flow by third-party platforms, who make profits by applying a commission on the basis of transaction value.

In China, the cross-border e-commerce industry has demonstrated stable and rapid development thanks to appropriate policy support and progressive establishment of e-commerce platforms, while an integrated industrial chain, consisting of marketing, payments, logistics and financial services, has begun to take shape. Whereas the average annual growth rate of China's traditional foreign trade fell to less than 10 percent from 2012 to 2016 (NBS, 2017), the corresponding rate of the cross-border e-commerce industry remained between 20 and 50 percent. According to CECRC (2017), the overall transaction volume of China's import and export e-commerce was RMB3.15tn in 2013, while its growth rate was 50 percent. This represented 12.2 percent of China's total import and export trade volume in the same year. In 2016, the transaction volume of China's cross-border e-commerce industry reached RMB6.7tn, with a year-on-year growth rate of over 20 percent, accounting for around 28 percent of China's import and export volume of the corresponding period. It was estimated that the transaction volume would grow to RMB8.8tn by 2018 (iiMedia Research, 2017) and to RMB12tn by 2020, contributing to around 37.6 percent of China's total import and export trade volume, with the market expanding to include over a billion customers (AliResearch, 2016). Furthermore, report data from a global perspective indicates that the B2C cross-border e-commerce turnover of China amounted to US$766.5bn in 2015 (Ecommerce Foundation, 2016). China, the USA (US$595.1bn), the UK (US$174.2bn), Japan (US$114.4bn) and France (US$71.9bn) were the top 5 countries in terms of global B2C e-commerce sales in that year. Taking into account trade volume, market size, business types and commodity categories, it is reasonable to conclude that China's cross-border e-commerce industry has been maintaining a rapid pace of growth and is leading the race in global markets (Yang et al., 2014).

As a novel source of cross-border transactions that combines international trade with electronic commerce, cross-border e-commerce has exerted enormous impacts on trade entities and their operating mechanisms, processes and competitive posture (Balls and Dunleavy, 2000; Fingar, 2000; Kauffman and Walden, 2001). Foreign trade barriers have been lowered for small and micro enterprises and they have been able to engage in

cross-border e-commerce to accumulate resources which used to be accessible only by large enterprises. Their profit margins have been expanded owing to fewer intermediate links and lower transaction costs. By 2014 there were over 200,000 enterprises engaged in cross-border electronic commerce with around 5000 online trading platforms, while over 90 percent of newly-registered vendors were medium, small or micro enterprises or self-employed industrialists. Complementary trade activities comprised of B2B, B2C, B2B2C, B2M, C2B, C2C, C2M, M2C and so forth came into being successively, resulting in an increasingly active market, while a batch of newly-emerged giants have risen from the cross-border e-commerce industry to exert influence upon business regulations and trade rules on a global scale.

Export e-commerce has been capturing a rising share of the overall cross-border e-commerce due to its advantages such as providing low product cost, the increasing numbers of mobile terminals and the prospect of a large market of overseas Chinese consumers. With regard to B2C, exporters have been benefiting from the development dividend of the industry for years, and have, therefore, taken root in niche markets of long-tail products. The trade volume of emerging B2C platforms, such as LightInTheBox, Milanoo, DinoDirect and AliExpress, has been growing vigorously. According to Internet Retailer, the trade volume of Chinese vendors, who have been expanding their distribution channels to trading platforms all over the globe, increased by 200 percent in 2016. Whereas 80 percent of the online vendors are concurrently operating on eBay, Amazon, AliExpress, DHgate and some other platforms, relatively larger e-commerce exporters have set up their own marketing platforms. For B2B, the industry of bulk stock and manufacturing cross-border e-commerce, whose main feature is integrative development of logistics and financial services, has been growing.

However, it should be noted that cross-border e-commerce still comprises a comparatively low portion of China's total import and export trade volume, owing to foreign-trade-related legal restrictions as well as the absence of public regulation for taxation and logistics. In addition, there are long-standing challenges faced by the industry, including a shortage of talent, imperfect infrastructure, cumbersome transaction processes, comparatively low levels of informatization in business operations (Wen et al., 2013), credit risk in cross-border payments and settlements, as well as immaturity of international business logistics. In global markets, cross-border e-commerce has also faced trade barriers, consisting of distribution costs, regulatory hurdles and other forms of newly-presented trade protectionism (Kaynak et al., 2005; Wang and Tseng, 2011).

When operating transnationally, enterprises engaged in cross-border e-commerce face severe risks, including political risk, natural hazards, infrastructure risk, industrial chain risk, human resources risk, service supply chain risk, taxation risk, risk of

consumer disputes, risk of data acquisition failure and regulatory invalidation of government agencies (Pilkington and Farron, 2000; Cai, 2001; Hughes and Glaister, 2001; Samiee, 2008; Gupta et al., 2010; Xue and Wang, 2011; Alm and Melnik, 2012; Gomez-Herrera et al., 2014). In 2015, China Inspection and Quarantine had accumulatively supervised 192 million orders of cross-border e-commerce products, with a total value of RMB28.42bn, confirming that 8.8 percent of samples were defective products. Taobao Global alone had already removed up to 30,000 vendors involved with counterfeit commodities as well as assisted police in cracking 469 counterfeiting cases, with a total value involved of RMB3.067bn during the period from February 2016 to February 2007. A relatively high occurrence of trade risk events has hindered the development of China's cross-border e-commerce industry, causing Chinese enterprises to be locked into the low end of the global value chain.

In consideration of new evidence regarding China's cross-border e-commerce industry development, an index needs to be established to reflect the current situation of development and of the magnitude of risk in China's export e-commerce industry. However, due to asymmetric information and insufficient data, little research has been conducted on the current status and trends of industry prosperity as well as of the magnitude of risk, resulting in tremendous challenges in relation to business administration, operation and research. For this purpose, the present study has briefly reviewed the policy context of the cross-border electronic commerce industry thriving in China and has subsequently constructed an index of China's export e-commerce prosperity as well as an index of China's export e-commerce risk magnitude to examine the industry's scale, characteristics and seasonal trends, and the risk level of the e-commerce exports. The remainder of the study proceeds as follows. Section II reviews the policies and provisions related to supporting as well as supervising the cross-border e-commerce industry enacted by the State Council and other central ministries of China. Section III discusses how the data are gathered, how the indexes are calculated and how variables are selected. Sections IV and V examine the current prosperity and risk magnitude in China's export e-commerce industry using a prosperity index and a risk index for China's export e-commerce, respectively. Section VI presents the conclusions, the relevant discussion and further prospects for cross-border e-commerce in China.

II. Policy Backdrop of China's Cross-border E-commerce Development

The burgeoning cross-border e–commerce industry has become an essential impetus of the innovation-driven development strategy under the "new normal" of China's economy; however, sustainable healthy development of this industry requires regulation

as well as support from policies. On that account, the State Council and other related ministries have frequently enacted favorable policies towards the cross-border e-commerce industry and have vigorously pushed forward with the comprehensive reform involving pilot zone projects for cross-border e-commerce.

Cross-border e-commerce has seen rapid growth in China since 2007 when the strategic task of developing electronic commerce was for the first time proposed nationwide in *The Eleventh Five-year Development Plan for E-commerce*. From 2009 to 2010, a train of announcements and policies aimed at normalizing and inspiring cross-border e-commerce activities at the institutional level were introduced by central agencies such as the Ministry of Commerce and the People's Bank of China, including *Opinions on Accelerating the Development of Electronic Commerce in the Field of Circulation* as well as *Implementing Provisions of the Pilot RMB Settlement Management in Cross-border Trade*, which set the scene for subsequent progression of cross-border e-commerce enterprises.

Subsequent critical policy documents relating to the environment and institutions of the industry are listed in Table 1.

Table 1. Policies and Provisions Concerning Environment and Institutions of the Cross-border E-commerce Industry

Release date	Department	Policy document or event	Key points
March 2012	Ministry of Commerce	*Several Opinions on Utilizing E-commerce Platforms to Develop Foreign Trade*	1. Enhancing the service functions of e-commerce platforms for foreign trade 2. Promoting will and capacity of enterprises utilizing e-commerce platforms to develop foreign trade
May 2012	General Office of the National Development and Reform Commission	*Notice on Organizing and Carrying out the Pilot Program of E-commerce in National E-commerce Demonstration Cities*	1. Putting forward the concept of cross-border trade e-commerce service pilots 2. The 6 pilot cities: Shanghai, Hangzhou, Ningbo, Zhengzhou, Chongqing and Xi'an
July 2014	General Administration of Customs	*Announcement on Matters Concerning the Supervision and Administration of Imported and Exported Goods and Articles via Cross-border E-commerce*	1. Declaring the implementation of the supervision system for goods and articles transacted on certain e-commerce platforms with declaration forms 2. Completing the customs declaration formalities of imported and exported e-commerce goods in the mode of "checklist verification and consolidated declaration"
March 2015	State Council	*Report on the Work of the Government (2015)*	Putting forward for the first time the "Internet Plus" action plan to guide Internet-based companies to increase their presence in the international market
June 2015	State Council	*Guiding Opinions on Promoting Sound and Speedy Development of Cross-border E-commerce*	Inspiring foreign trade service providers to offer comprehensive foreign trade services including customs clearance, logistics, warehousing and financing services

(*The table continues on the next page.*)

March 2016	State Council	*Report on the Work of the Government (2016)*	1. Encouraging innovative business models by expanding trials in cross-border e-commerce, supporting overseas warehouses for exported products and by promoting the development of comprehensive foreign trade services providers 2. Facilitating trade by implementing the international trade single window system nationwide and by reducing the frequency of inspections for exports 3. Impelling innovative "Internet Plus Foreign Trade" industry based on driving the traditional economy

Major notices, announcements and opinions related to China's export e-commerce are listed in Table 2.

Table 2. Policies and Provisions Concerning China's Export E-commerce

Release date	Department	Policy document or event	Key points
August 2013	Nine ministries and commissions, including the Ministry of Commerce, the National Development and Reform Commission and the Ministry of Finance	*Opinions on Implementing Relevant Policies to Support the Cross-border E-commerce Retail Export*	1. Implementing supportive policies involving exemption or refund of VAT and consumer taxes on eligible export e-commerce goods 2. The five cross-border trade e-commerce clearance service pilot cities: Shanghai, Chongqing, Hangzhou, Ningbo and Zhengzhou
December 2013	Ministry of Finance	*Notice on Tax Policies for Cross-border Retail Exports in E-commerce*	Defining certain conditions for tax refunds or exemptions for e-commerce retail exported goods
February 2014	General Administration of Customs	Announcing customs supervision model code "9610"	Marking that cross-border e-commerce exports started to be supervised through a separate conduit: "9610" stands for "e-commerce in cross-border trade" and is abbreviated as "e-commerce"
May 2015	State Council	*Several Opinions on Accelerating Cultivation of New Competitive Advantages of Foreign Trade*	1. Incubating a batch of cross-border e-commerce platforms and enterprises 2. Inspiring e-commerce exporters to merge with overseas retail systems based on legitimate activities such as overseas warehousing

Key policy documents and events with respect to China's import e-commerce are listed in Table 3.

Last but not least, momentous policies and provisions in relation to the China International Trade Single Window and China Cross-border E-commerce Comprehensive Pilot Areas are listed in Table 4.

Table 3. Policies and Provisions Concerning China's Import E-commerce

Release date	Department	Policy document or event	Key points
March 2014	General Administration of Customs	*Notice on Issues Concerning Bonded Import E-commerce Pattern in Cross-border Trade E-commerce Service Pilots*	Clarifying commodity range, buying quotas, quantity limits, taxation details as well as enterprise administration of import pilots concerning the form of bonded import e-commerce
July 2014	General Administration of Customs	*Announcement on Issues Concerning the Regulation of Goods and Articles Entering and Exiting China through Cross-border Trade E-commerce*	1. Further improving institutions and provisions concerning customs clearance of cross-border e-commerce 2. Ratifying the pattern of bonded import e-commerce in cross-border trade and starting to supervise cross-border e-commerce imports through a separate conduit: "1210" stands for "bonded cross-border trade e-commerce" and is abbreviated as "bonded e-commerce"
April 2016	The Ministry of Finance, the General Administration of Customs and the State Administration of Taxation	*Notice on the Tax Policies on Cross-border E-commerce Retail Imports*	1. Putting forward two "positive lists (white lists)" of imported commodities in cross-border e-commerce retail 2. Specifying that imported commodities in cross-border e-commerce retail should be subject to tariffs, import VAT and consumption tax as goods
May 2016	State Council	Approving a 1-year transitional period of relevant regulatory requirements	The 15 pilot areas supervised by pilot approach: Tianjin, Shanghai, Hangzhou, Ningbo, Zhengzhou, Guangzhou, Shenzhen, Chongqing, Fuzhou, Pingtan, Chengdu, Dalian, Qingdao, Suzhou and Hefei
November 2016	Ministry of Commerce	Approving the transitional period to extend to the end of 2017	Contributing to a smooth transition towards cross-border e-commerce retail imports

Table 4. Policies and Provisions Concerning China International Trade Single Window and China Cross-border E-commerce Comprehensive Pilot Areas

Release date	Department	Policy document or event	Key points
February 2014	State Council and other ministries concerned	Activating the trial of China International Trade Single Window in Shanghai	Followed by a sequence of administrative efforts
July 2014	General Administration of Customs	Initiating China's first Cross-border E-commerce Clearance Service Platform in Dongguan	Aiming at unifying customs declaration process and at lifting clearance efficiency primarily for medium and small foreign trade enterprises
March 2015	State Council	Policies and procedures of port affairs facilitating the International Trade Single Window	1. Building collaboration mechanism of the "Simplified Customs" strategy 2. Attempting to build cross-regional and inter-departmental "Simplified Customs"
March 2015	State Council	*Official Reply on Approving the Establishment of the China (Hangzhou) Cross-border E-commerce Comprehensive Pilot Area*	1. Identifying Hangzhou as China's first cross-border e-commerce comprehensive pilot area, a center of nationwide entrepreneurship, of innovation, of service and of big data in the industry of cross-border electronic commerce 2. Integrating the customs, logistics services and financial services with the administration of taxation, of foreign exchange, of inspection and quarantine as well as of commerce

(*The table continues on the next page.*)

August 2015	State Council and other ministries concerned	Initiating the International Trade Single Window projects	1. Functioning in provinces and municipalities including Shanghai, Tianjin and Fujian 2. Approaching operation phase or trial operation phase of certain single window projects in Zhejiang, Guangdong and Jiangsu
January 2016	State Council	Setting up a new batch of Cross-border E-commerce Comprehensive Pilot Areas	1. With a planning scheme of "1+12": Tianjin, Shanghai, Chongqing, Hefei, Zhengzhou, Guangzhou, Chengdu, Dalian, Ningbo, Qingdao, Shenzhen and Suzhou 2. Expecting replicable and propagable experience for nationwide popularization

A multitude of favorable policies concerning cross-border electronic commerce have been introduced by the State Council and relevant ministries as well as commissions of China since 2007. Emphasis has been placed on the growth of the export sector of cross-border e-commerce, while cross-border e-commerce pilot areas have been set up one after another on a national scale. The prosperity of the industry has been driven by this sequence of policies and provisions, indicating the great importance attached by the government to the construction of the cross-border electronic commerce industrial chain in the form of a package of composite measures comprised of supportive policies, permissive administration and regional pilots.

III. Data Acquisition, Index Construction and Variable Selection

The prosperity index and the risk index for China's export e-commerce industry along with secondary sub-indexes were designed by the "Big Data + Cross-border E-commerce" Innovation Research Group of Zhejiang University (i.e. Ma Shuzhong Studio) based on authentic firm-level business data for cross-border e-commerce exports in China from 2014 to 2017. Fixed base indexes of all historical reporting periods were preliminarily formulated in May 2017 and first released in September 2017. From 2018, monthly fixed base indexes of reporting periods will be measured and released in January and July.

Among reports and indexes for evaluating prosperity and development of foreign trade of certain countries, the most authoritative studies are Michael Porter's *Business Competitiveness Index*, Jeffery Sachs' *Growth Development Index* as well as the *Global Competitiveness Index* developed by Sala-i-Martin and Artadi. Since 2011, the OECD has been publishing its *Trade Facilitation Indicators*, with the full spectrum of border procedures covered from advance rulings to transit guarantees for 163 countries. With regard to the cross-border e-commerce industry, some early-stage regional development indexes have been created over the past few years, including the *Cross-border E-commerce Index of Hangzhou* as well as the *2017 White Paper on Cross-border E-commerce* based on Shanghai Port data. Applying the methodologies for selecting

variables and constructing indexes in the literature and industry reports mentioned above, this study aims to reveal the industry prosperity and the risk magnitude of the e-commerce export industry nationwide.

1. Collecting Data

The data utilized for constructing the prosperity index and the risk index for China's export e-commerce industry are derived from the hosted enterprise database of Jiangsu BizArk E-commerce Co., Ltd.. BizArk is currently the largest total solution provider of overseas marketing and cross-border e-commerce hosting service platform in China, while it is also the most preferred partner in the Yangtze River Delta region (especially in Zhejiang Province) of traditional foreign trade manufacturing enterprises for entering the industry of cross-border electronic commerce. Initiated by BizArk, its hosted service has incorporated a variety of cross-border e-commerce activities, including B2B, B2C and B2B2C. The BizArk operational database for cross-border e-commerce hosting services has accumulated a huge quantity of detailed business data for more than 200 first-class exporting manufacturers in all links of the industrial chain, including manufacturing, customs clearance, logistics, warehousing and marketing.

2. Constructing the Indexes

The prosperity index for China's export e-commerce industry is designed to reflect and to predict the industry scale, as well as the gross characteristics and the seasonal trends of the cross-border e-commerce export industry in China. Subsequently, various aspects of growth of the industry can be further examined, including the scale of suppliers, sales volume, the level of trade facilitation as well as the level of prosperity in each link of the supply chain; namely, manufacturing, transporting, warehousing and marketing.

The risk index for China's export e-commerce industry is constructed on the basis of the prosperity index so as to further monitor, forecast and mitigate the magnitude of risk of cross-border electronic commerce exports in China with a focus on four kinds of typical risks, including risk of customs clearance and tariff payments, of product sales, of enterprise profit, and of after-sales refunds. These four kinds of risks roughly cover the critical risks in each link of the export e-commerce industry.

Monitoring prosperity could be combined with risk forecasting to complementarily represent the current development status of cross-border e-commerce exports in China. In particular, the preliminary conclusions from constructing the prosperity index would offer guidance as well as inspiration for the design of the risk index system, while the latter index is an extension of the former.

The prosperity indexes and the risk indexes of China's export e-commerce industry are measured monthly as fixed base indexes through dividing the reporting-period absolute values by the base-period absolute values of the indicators. Since 2014, customs supervision model codes 9610 (e-commerce in cross-border trade), 1039 (market purchasing) and 1210 (bonded cross-border trade e-commerce) have been successively added by the General Administration of Customs, signifying that import and export e-commerce will henceforth be recorded to generate regulatory and statistical data. Given the fact that there is generally a transitional period for every newly-enacted policy or provision and that data for most sub-indexes had not been recorded until January 2014 or January 2015, a unified base period of January 2015 is selected for the purpose of horizonal comparison and analysis. In addition, the beginning months are selected as the base periods for those indexes whose data have just been recorded since January or May 2016. Specifically, the base periods of May 2016 and January 2016 are selected for the logistics facilitation index and the customs facilitation index, respectively, while the base period for the tariff payment risk index is set as January 2016.

3. Selecting Variables

(1) Prosperity Index for China's Export E-commerce

The prosperity index for China's export e-commerce consists of the composite index along with nine sub-indexes, including the supplier scale indexes (i.e. the supplier amount index and the supplier volume index), the sales volume index, the trade facilitation indexes (i.e. the logistics facilitation index and the customs facilitation index) as well as the supply chain cost indexes (i.e. the manufacturing cost index, the transporting cost index, the warehousing cost index and the marketing cost index). In particular, the composite index of the prosperity index is comprehensively calculated from the sub-indexes mentioned above through principal component analysis, a data analysis approach utilized for recombining a multitude of correlated indicators into a few principal components through orthogonal transformation.

The supplier scale indexes are comprised of the supplier amount index and the supplier volume index. The former index refers to the amount of the suppliers engaged in exporting through cross-border electronic commerce, while the latter stands for the average sales volume of these suppliers. The above two sub-indexes complement each other to collectively represent the scale of export e-commerce suppliers in each statistical period.

The sales volume index stands for the total value of products sold through cross-border e-commerce export items in the corresponding statistical period, revealing the

sales quantity of China's export e-commerce industry.

The trade facilitation indexes are comprised of the logistics facilitation index and the customs facilitation index. According to the *Trade Facilitation Indicators* put forward by the OECD, the logistics facilitation index refers to the reciprocal of the total duration of logistics weighted by the proportion of the item's manufacturing cost to overall manufacturing costs,[1] while the customs facilitation index represents the logarithm[2] of the reciprocal of the share of tariffs in total transporting costs weighted by the proportion of the item's manufacturing cost to the overall manufacturing cost. The above two sub-indexes supplement each other to collectively represent the level of trade facilitation in each statistical period.

The supply chain cost indexes are comprised of the manufacturing cost index, the transporting cost index, the warehousing cost index and the marketing cost index. Indeed, it would be most appropriate to select scales of manufacturing, transporting, warehousing and marketing to generate sub-indexes in order to demonstrate the current situation of prosperity in each link of the supply chain. Yet the costs of manufacturing, transporting, warehousing and marketing, respectively, are actually adopted in practice owing to the availability of data. It is generally believed that the cost in each link of the supply chain frequently exhibits a high correlation with the degree of development; hence the above four sub-indexes would supplement each other to collectively represent the level of prosperity in various supply chain links in each statistical period.

Formulas for the sub-indexes mentioned above are displayed in Table 5.

(2) The Risk Index for China's Export E-commerce

The risk index for China's export e-commerce consists of the composite index along with four sub-indexes, including the tariff payment risk index, the products sales risk index, the enterprise profit risk index as well as the after-sales refund risk index. The composite index of the risk index is comprehensively calculated using the sub-indexes mentioned above through principal component analysis.

The tariff payment risk index refers to the logarithm[3] of the share of tariffs in total

[1]Measured by free-on-board price, the manufacturing cost of the item represents the evaluation by both entities on product value of the item when suppliers deliver their products to cross-border e-commerce hosting service providers. This manufacturing cost indicator could therefore be used to measure the intrinsic value of the product until it enters the actual phase of sales. To highlight the significance of the items of comparatively high intrinsic value, the free-on-board manufacturing cost of the item is adopted as the weighting factor in this study, similarly hereinafter.

[2,3]In consideration of the relatively drastic fluctuation among different months, the fixed base index is calculated on the basis of the logarithmic transformation.

transporting cost weighted by the proportion of the item's manufacturing cost to the overall manufacturing cost, revealing the risk of an excessive amount of tariffs paid in contrast to the overall transporting cost of the item.

Table 5. Sub-index Formulas of the Prosperity Index for China's Export E-commerce

	Sub-index	Formula (of the reporting-period absolute value for simplicity, whereas the base-period absolute value is used as the divisor to generate fixed base indexes in practice)
Supplier scale indexes	Supplier amount index	Amount of cross-border e-commerce suppliers
	Supplier volume index	Total sales volume/Amount of cross-border e-commerce suppliers
Sales volume index		Σ Sales volume of item
Trade facilitation indexes	Logistics facilitation index	Σ ((1/Actual duration of logistics of item) × (Manufacturing cost of item/Overall manufacturing cost))
	Customs facilitation index	ln Σ ((Transporting cost of item/Tariff of item) × (Manufacturing cost of item/Overall manufacturing cost))
Supply chain cost indexes	Manufacturing cost index	Σ Manufacturing cost of item
	Transporting cost index	Σ Transporting cost of item
	Warehousing cost index	Σ Warehousing cost of item
	Marketing cost index	Σ Marketing cost of item

Notes: Transporting cost of item = Domestic transporting cost + Destination country transporting cost + Tariff + Ocean freight; Marketing cost of item = Platform cost + Hosting cost + Advertising cost.

The product sales risk index stands for the reciprocal of the completion rate of the item's sales target weighted by the proportion of the item's sales volume to the overall sales volume, demonstrating the risk of insufficient actual sales volume compared with the sales target of the item.

The enterprise profit risk index refers to the reciprocal of the item's ratio of profit to the total cost weighted by the proportion of the item's sales volume to the overall sales volume, reflecting the risk of insufficient profit gained by cross-border e-commerce suppliers in contrast to the total cost of the item.

The after-sales refund risk index stands for the item's share of refunds in the total cost weighted by the proportion of the item's sales volume to the overall sales volume, representing the risk of an excessive amount of the refunds applied for by consumers compared with the total cost of the item.

Formulas for the sub-indexes mentioned above are presented in Table 6.

Table 6. Sub-Index Formulas of the Risk Index for China's Export E-commerce

Sub-index	Formula (of the reporting-period absolute values for simplicity, whereas the base-period absolute values are used as divisors to generate fixed base indexes in practice)

(*The table continues on the next page.*)

Tariff payment risk index	ln Σ ((Tariff of item/Transporting cost of item) × (Manufacturing cost of item/Overall manufacturing cost))
Products sales risk index	Σ ((1/Sales target completion rate of item) × (Sales volume of item/Overall sales volume))
Enterprise profit risk index	Σ ((Total cost of item/Profit of item) × (Sales volume of item/Overall sales volume))
After-sales refund risk index	Σ ((Refund of item/Total cost of item) × (Sales volume of item/Overall sales volume))

Notes: Sales target completion rate of item = Actual sales volume of item / Sales target of item; Total cost of item = Manufacturing cost + Refund + Platform cost + Hosting cost + Tariff + Transporting cost + International logistics cost + Warehousing cost + Processing cost + Service cost + Advertising cost.

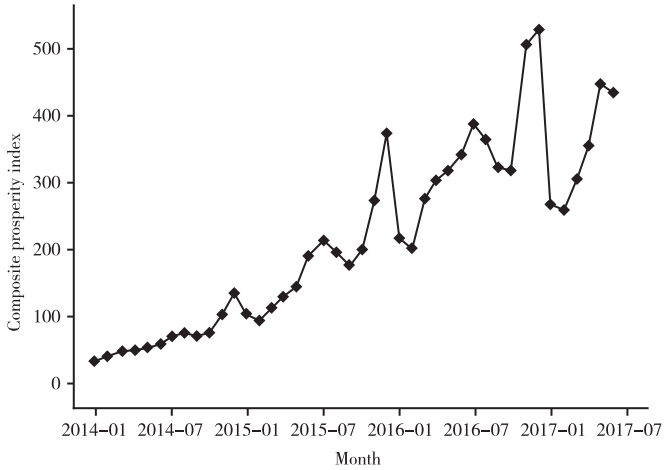
IV. Current Situation of Prosperity in China's Cross-border E-commerce Exports

1. Composite Current Status of Export E-commerce

The composite prosperity index and the sub-indexes of China's export e-commerce industry suggest a steady growth of cross-border e-commerce exports in China from January 2015 to June 2017 (Figure 1 and Figure 2). With respect to most indexes, increasingly significant rises appear every July and August, while most remarkable growths emerge in November and December. In most instances, such seasonal increases would be followed

Figure 1. Composite Prosperity Index of China's Export E-commerce

(Base-period Value = 100)

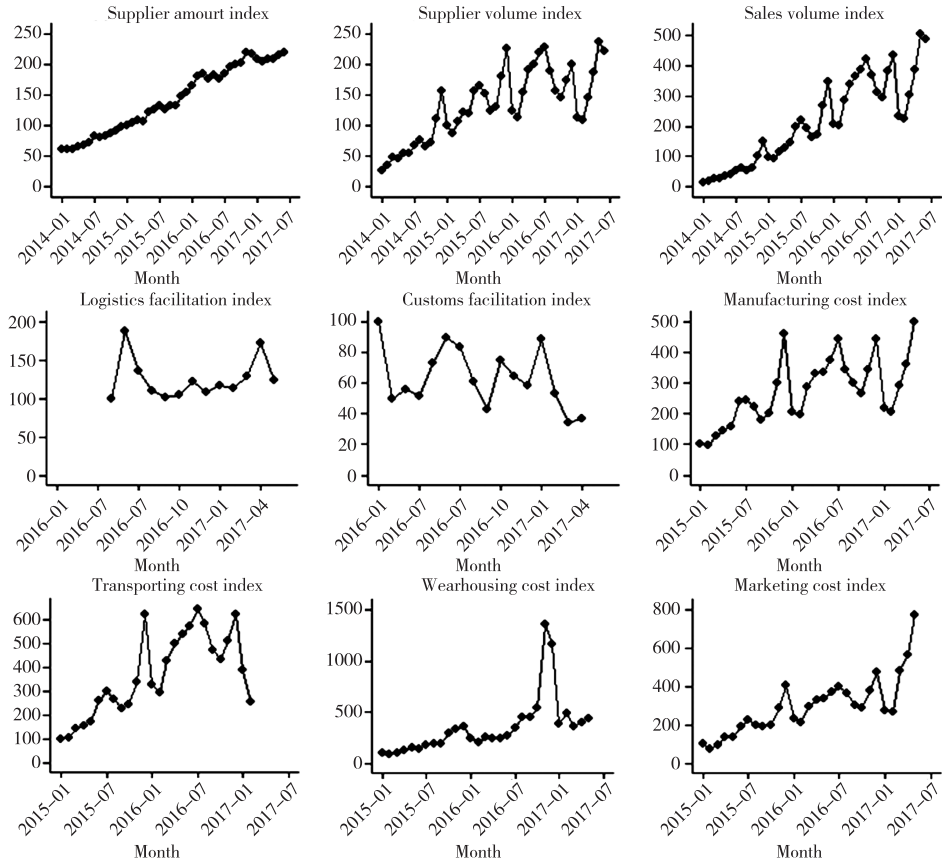


Source: Authors' own calculation.

Note: January 2015 is selected as the base period.

by certain falls. In particular, the transporting cost index arose most dramatically in the closing months of 2015, while the most rapidly rising index by the end of 2016 was the warehousing cost index. Marketing costs grew strongly in May and June 2017.

Figure 2. Prosperity Sub-indexes of China's Export E-commerce
(Base-period Value = 100)



Source: Authors' own calculation.

Notes: Based on data availability, the base periods of May 2016 and January 2016 are selected for the logistics facilitation index and the customs facilitation index, respectively. For other indexes, the base period of January 2015 is selected.

The composite prosperity index of China's export e-commerce industry is calculated based on principal component analysis of nine sub-indexes. Generally, China's cross-border e-commerce exports present a booming trend from January 2014 to the first half of 2017. Significant rises appear every July and August, while more remarkable growth

emerges in November and December. Such seasonal increases would be followed by certain falls the following January and February

2. Respective Current Status of Export E-commerce

(1) Amount of Suppliers

The supplier amount index shows a tendency of steady increases of export e-commerce suppliers in China from January 2014 to June 2017 without distinct fluctuation or evident influence from seasonal factors.[2]

(2) Volume of Suppliers

Fluctuant growth can be observed from the average sales volume of Chinese export e-commerce suppliers from January 2014 to June 2017. Comparatively significant peak increases come into being in November and December, while roughly similar peaks arise during the period from June to August of the next year. Such seasonal growth is followed by falls.

(3) Volume of Sales

The sales volume index reveals a fluctuant increase in the sales quantity of China's export e-commerce industry from January 2014 to June 2017. The first and second wave of seasonal spikes in sales of each year occur from July to August and from November to December, respectively, followed by declines. In online shopping, such seasonal trends are consistent with the occurrence of events such as summer sales and the Black Friday shopping frenzy, implying possible causality between the index variance and real-world events.

(4) Level of Logistics Facilitation

The logistics facilitation index suggests a relatively steady speed of logistics of China's cross-border e-commerce exports from May 2016 to May 2017, whereas differences can be identified between the tendency for the 2 years. In 2016, the logistics facilitation index declined continuously due to the extension of average duration of logistics. The average duration was reduced from the beginning of 2017, resulting in an uptrend of the degree of trade facilitation.

(5) Level of Customs Facilitation

The customs facilitation index shows a drastic fluctuation in the tariff cost of cross-

[2]Sub-indexes of the prosperity index system mentioned in this subsection are displayed in Figure 2.

border e-commerce exports in China from January 2016 to April 2017. Tariffs appear to be relatively low in the initial months of each year and to increase in March and April in contrast to total transporting costs. A spike of the degree of customs facilitation can be spotted in June and July 2016, whereas the lowest value of the customs facilitation index is reached in September 2016.

(6) Scale of Manufacturing Costs

The manufacturing cost index exhibits a tendency of fluctuant growth in the level of prosperity in the manufacturing link of the supply chain of export e-commerce from January 2015 to May 2017. Comparatively significant peak increases come into being in November and December, while roughly similar peaks arise in the following months of June and July. Such seasonal growth is followed by a fall. In addition, a distinct increase emerges in the period of March to May of 2017.

(7) Scale of Transporting Cost

The transporting cost index demonstrates a fluctuant yet rapid growth of the level of prosperity in the transporting link of the supply chain of export e-commerce from January 2015 to February 2017. The first, the second and the third wave of apparent spikes occurred in December 2015, July 2016 and December 2016, yet the total cost of transporting has been falling since 2017.

(8) Scale of Warehousing Costs

The warehousing cost index represents a steady increase in the level of prosperity in the warehousing link of the supply chain of export e-commerce from January 2015 to May 2017 without distinct fluctuation or evident influence from seasonal factors, except for the most obvious increase in November 2016, which was then followed by a prompt decline to the previous level.

(9) Scale of Marketing Cost

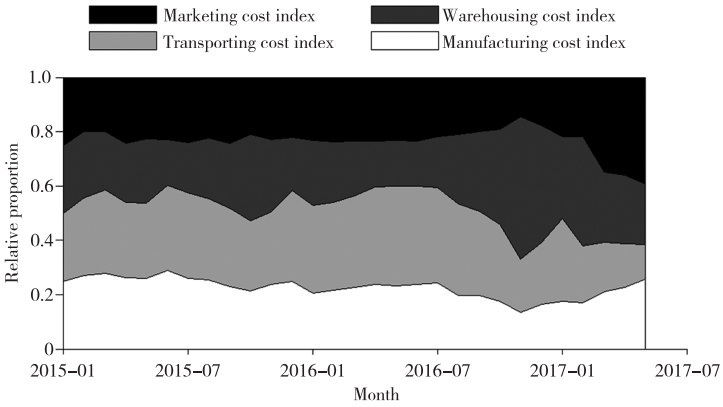
The marketing cost index suggests relatively fluctuant growth of the level of prosperity in the marketing link of the supply chain of China's cross-border e-commerce exports from January 2015 to May 2017. The first and the second wave of seasonal spikes in marketing costs for each year occur from June to July and from November to December. In addition, the most distinct increase emerged in the period from March to May 2017.

(10) Relative Proportions of Cost Scale in Separate Links of the Supply Chain

Fluctuations and trends of the relative proportions of the cost indexes in separate links of

the supply chain of China's cross-border e-commerce exports from January 2015 to May 2017 reveal a moderate yet solid decrease in the relative importance of manufacturing costs, while the proportion of transporting costs to the total costs of the supply chain has seen a tendency of decrease (Figure 3). The share of warehousing costs is proven to be sensitive to seasonal factors, with a most obvious spike in November and December 2016, whereas a steady increase of the relative importance of marketing costs has been maintained since February 2017.

Figure 3. Relative Proportions of Supply Chain Cost Indexes



Source: Authors' own calculation.

Changes in the industry status of export e-commerce in China have been therefore manifested in the tendency of relative proportions of the cost scale in separate links of the supply chain. To be more specific, the competitive focus of China's cross-border e-commerce exports has gradually shifted over time from cutting down costs of logistics and of warehousing to contending for cheaper and more efficient marketing techniques as well as marketing channels, leading to a new phase of the industry focused on developing competitive edges and localizing activities.

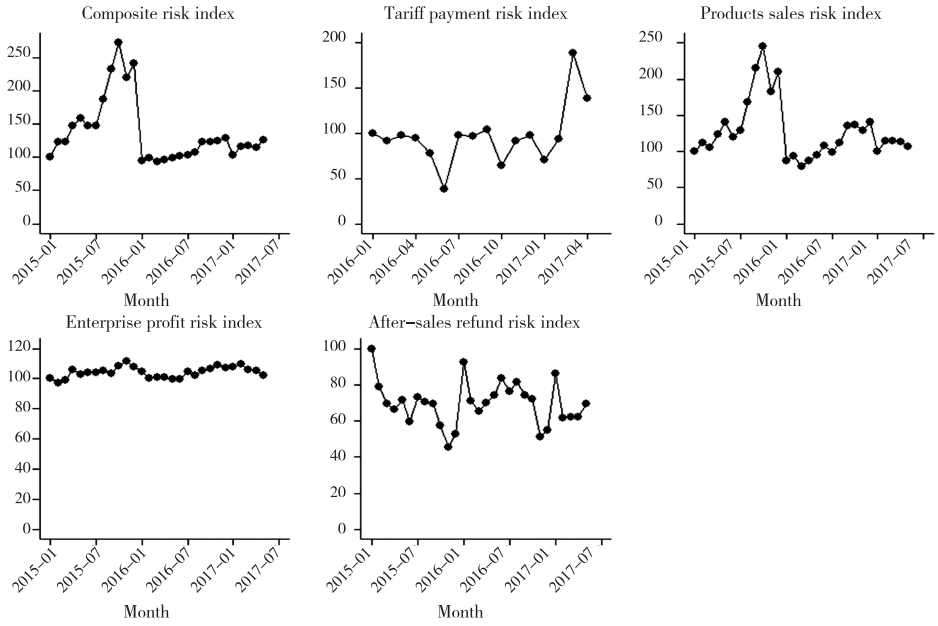
V. Current Situation of Risk Magnitude in China's Cross-border E-commerce Exports

1. Composite Current Status of Export E-commerce Risks

The composite risk index of China's export e-commerce demonstrates a remarkable amelioration of risk magnitude in China's export e-commerce from January 2015 to May 2017, as the overall level of the index proves to be high in 2015 but comparatively low in 2016 and 2017. To be more specific, the overall risk magnitude was prominent

from September to December 2015 mainly on account of high products sales risks and generally low completion rate of sales targets during this period. This trend was followed by an apparent decline in the degree of overall risk in 2016. In contrast to the situation in 2016, the level of export e-commerce risks has somewhat ascended in 2017. The significant peak increase of the tariff payment risk in 2017 deserves attention.

Figure 4. Risk Indexes of China's Export E-commerce (Base-period Value = 100)



Source: Authors' own calculation.

Notes: Based on data availability, the base period of January 2016 is selected for the tariff payment risk index. For other indexes, the base period of January 2015 is selected.

The composite risk index of China's export e-commerce industry is comprehensively calculated through principal component analysis of four sub-indexes. The composite risk magnitude is prominent from September to December 2015, followed by a prompt decline to the previous level, and the level of composite export e-commerce risk remains comparatively low in 2016 and 2017.

2. Current Status of Export E-commerce Risks

(1) Magnitude of the Tariff Payment Risk

The tariff payment risk index displays a drastic fluctuation of the risk of excessive

amounts of tariffs paid in contrast to the overall transporting cost of China's cross-border e-commerce exports from January 2016 to April 2017.[3] The tariff payment risk reached low levels in June and October 2016 as well as in January 2017, but such decreases were followed by increases. In addition, the most distinct increase emerged in the period of February to March 2017, which deserves attention.

(2) Magnitude of the Products Sales Risk

The products sales risk index demonstrates an evident amelioration of the risk of insufficient actual sales volume compared with sales targets of Chinese export e-commerce items from July 2014 to May 2017. The seasonal spike of products sales risk for each year occurs from August to December, whereas the most remarkable growth occurs in the corresponding period of 2015, followed by a fall in the risk level in 2016.

(3) Magnitude of the Enterprise Profit Risk

The enterprise profit risk index reveals a fluctuation in the risk of insufficient profit gained by cross-border e-commerce suppliers in contrast to the total cost of the export e-commerce items from January 2015 to May 2017. The first, the second and the third wave of comparatively significant spikes occur, respectively, in April 2015, July 2016 and February 2017, whereas seasonal peak increases emerge every October and November. Such rises are followed by falls.

(4) Magnitude of the After-sales Refund Risk

The after-sales refund risk index shows a trend of a moderate yet fluctuating decrease in the risk of excessive amounts of refunds applied for by consumers compared with the total cost of the export e-commerce items from January 2015 to May 2017. Seasonal spikes in after-sales refunds each year occur in January, July and August, respectively, followed by apparent declines to the previous levels.

VI. Conclusions, Discussion and Further Prospects for Cross-border E-commerce Exports in China

1. Conclusions and Discussion

China's cross-border e-commerce industry has developed rapidly thanks to policy support and progressive establishment of e-commerce platforms since 2007. The indexes for the prosperity and risk magnitude of China's export e-commerce industry have been constructed and calculated in this study to examine the industry scale, characteristics and seasonal trends,

[3]Sub-indexes of the risk index system mentioned in this subsection are displayed in Figure 4.

as well as the risk level of the cross-border e-commerce export process in China.

It is revealed by the prosperity indexes of China's export e-commerce industry that the industry scale generally grows from January 2014 to the first half of 2017. To be more specific, the amount of export e-commerce suppliers increases steadily, while the growth in the average sales volume of these suppliers fluctuates. Seasonal trends of the overall sales volume are consistent with events such as summer sales and the Black Friday shopping frenzy, implying possible causality between the index variance and real-world events. The logistics facilitation index indicates that the average duration of logistics fell from the beginning of 2017. In contrast, a drastic fluctuating tendency of the customs facilitation level is shown.

When considering the level of prosperity in each link of the supply chain, the scale of manufacturing costs of suppliers presents a tendency of fluctuant growth while the total cost of transporting has been falling since 2017. A steady increase in the warehousing cost of items occurred without distinct fluctuation. Marketing cost growth fluctuated, with the most distinct increase emerging in the period from March to May 2017. The competitive focus of China's cross-border electronic commerce exports has gradually shifted over time from reducing the cost of logistics and of warehousing to seeking cheaper and more efficient marketing techniques as well as marketing channels.

It is suggested by the risk indexes of China's export e-commerce industries that the industry experienced a remarkable amelioration of risk magnitude from January 2015 to May 2017. The overall magnitude of risk was prominent from September to December 2015, mainly on account of high product sales risks and of the generally low success rate of meeting sales targets during this period, whereas the overall level of risks is proven to be comparatively low in 2016 and to rise in 2017. The most distinct increase in the magnitude of risk for customs clearance and tariff payments emerges in the period from February to March 2017, which deserves attention, while an evident amelioration can be observed of the risk magnitude of product sales since 2016. In addition, a fluctuation in the risk magnitude of the enterprise profit of suppliers takes place, whereas a moderate yet fluctuating decrease is shown for the risk magnitude of after-sales refunds applied for by consumers.

Despite making reference to the published literature and industry reports when constructing the indexes, due to data availability, only a relatively small number of variables were used in the prosperity index and the risk index for China's export e-commerce. Representative characteristic indicators of the industry, average cost in major stages of the supply chain and typical risks are included as far as possible, whereas some other significant elements have to be omitted. Future research should, hence, be conducted to explore larger

and more comprehensive data sources, as well as to construct more precise indexes for this novel trade activity.

2. Further Prospects for Cross-border E-commerce Exports in China

Based on analysis of the current situation and the risk magnitude of China's cross-border e-commerce exports, the outlook for the industry is discussed as below.

The volume of export trade is expected to maintain strong growth. The industry scale of export e-commerce in China should increase persistently year on year, involving a variety of cross-border e-commerce activities, including B2B, B2C and B2B2C that upgrade constantly along with the emergence of novel businesses and the engagement of more medium and small-sized suppliers in export trade.

Facilitation of export trade should be promoted. Given the fact that the China International Trade Single Window will be established gradually, the quality of regulations and of services relating to novel foreign trade activities should be further improved with the widespread application of new technologies including cloud computing, big data technologies and the Internet of Things. Such promotion of trade facilitation will continuously reinforce the competences of enterprises in coordinating activities.

The service support system of export trade should be improved. A system of export e-commerce services should take shape step by step involving manufacturing enterprises, cross-border e-commerce platforms as well as providers of transporting, warehousing, marketing, financial services, and comprehensive foreign trade services. Barriers and costs would, therefore, be constantly lowered for medium and small sized suppliers accessing export services.

Risk mitigation in export trade is expected to improve. A client credit evaluation system for digital trade should be gradually constructed, while technological innovation and infrastructure development should remain major focuses, eventually leading to widespread application of smart transportation management systems and big data risk control mechanisms. It can be predicted that the competence of relevant departments and enterprises in monitoring, forecasting and mitigating various risks of cross-border e-commerce exports will strengthen.

References

Afuah, A. and C. L. Tucci, 2001, *Internet Business Models and Strategies*, New York: McGraw-Hill.

AliResearch, 2016, *Cross-border E-commerce Development Report of China 2016* [online; cited 12 February 2018]. Available from http://www.sohu.com/a/113375987_483389.

Alm, J. and M. I. Melnik, 2012, "Cross-border shopping and state use tax liabilities: Evidence from eBay transactions," *Public Budgeting & Finance*, Vol. 32, No. 1, pp. 5–35.

Balls, J. D., J. R. Dunleavy, K. M. Hartley, J. R. Hurley and G. Norris, 2000, *E-business and ERP: Transforming the enterprise*, New York: John Wiley & Sons, Inc.

Bradley, P., J. Thomas, T. Gooley and J. A. Cooke, 1999, "Future competition: Supply chain vs. supply chain," *Logistics Management and Distribution Report*, Vol. 39, No. 3, pp. 20–21.

Cai, Q., 2001, "Thoughts on the applicable problems of the international tax agreement with the transnational electronic commercial affairs," *Taxation and Economy*, Vol. 115, No. 2, pp. 37–40.

CECRC (China E-commerce Research Centre), 2017, *E-commerce Market Data Monitoring Report of China 2016* [online; cited 12 February 2018]. Available from: http://www.100ec.cn/zt/upload_data/16jcbg/16jcbg.pdf.

Ecommerce Foundation, 2016, *Global B2C E-commerce Report 2016* [online; cited 12 February 2018]. Available from: https://www.ecommercewiki.org/wikis/www.ecommercewiki.org/images/5/56/Global_B2C_Ecommerce_Report_2016.pdf.

Fingar, P., 2000, "Component-based frameworks for e-commerce," *Communications of the ACM*, Vol. 43, No. 10, pp. 61–7.

Gomez–Herrera, E., B. Martens and G. Turlea, 2014, "The drivers and impediments for cross-border e-commerce in the EU," *Information Economics and Policy*, Vol. 28, pp. 83–96.

Gupta, M. P. and R. Sareen, 2001, "A study of consumer concerns and issues of electronic payments in India," *Global Business Review,* Vol. 2, No. 1, pp. 101–19.

Hughes, J. F. and K. Glaister, 2001, "Electronic commerce and international taxation: A square peg in a round hole?" *European Management Journal*, Vol. 19, No. 6, pp. 651–8.

iiMedia Research, 2017, *Cross-border E-commerce Market Research Report of China 2016–2017* [online; cited 12 February 2018]. Available from: http://www.iimedia.cn/47588.html.

Kauffman, R. J. and E. A. Walden, 2001, "Economics and electronic commerce: Survey and directions for research," *International Journal of Electronic Commerce*, Vol. 5, No. 4, pp. 5–116.

Kaynak, E., E. Tatoglu and V. Kula, 2005, "An analysis of the factors affecting the adoption of electronic commerce by SMEs: Evidence from an emerging market," *International Marketing Review*, Vol. 22, No. 6, pp. 623–40.

Lai, Y. W. and K. Q. Wang, 2014, "Cross-border electronic commerce's development characteristics, obstacle factors and the next step in China," *Gaige* (*Reform*), Vol. 243, No. 5, pp. 68–74.

NBS (National Bureau of Statistics of China), 2017, "Annual data of total import and export volume of China" [online; cited 12 February 2018]. Available from: http://data.stats.gov.cn/easyquery.htm?cn=C01.

Pilkington, C. and S. Farron, 2000, "International direct taxation of e-commerce: Developing a new conceptual model from marketing principles," *Journal of Applied Accounting Research*,

Vol. 6, No. 1, pp. 85–109.

Samiee, S., 2008, "Global marketing effectiveness via alliances and electronic commerce in business-to-business markets," *Industrial Marketing Management*, Vol. 37, No. 1, pp. 3–8.

Terzi, N., 2011, "The impact of e-commerce on international trade and employment," *Procedia–Social and Behavioral Sciences*, Vol. 24, pp. 745–53.

Wang, Y. and M. M. Tseng, 2011, "Integrating comprehensive customer requirements into product design," *CIRP Annals-Manufacturing Technology*, Vol. 60, No. 1, pp. 175–8.

Wen, J., J. Wang and H. B. You, 2015, "Relationship between e-commerce and foreign trade: evidence from China," *Guoji Maoyi Wenti* (*Journal of International Trade*), No. 6, pp. 43–52.

Xue, W. L. and L. Wang, 2011, "A study on supply chain information risk evaluating index system under e-commerce," *Qingbao Kexue* (*Information Science*), Vol. 29, No. 1, pp. 28–31.

Yang, J. Z., B. X. Zheng and L. F. Yang, 2014, "Research on cross-border e-commerce index system based on factor analysis," *Caimao Jingji* (*Finance & Trade Economics*), No. 9, pp. 94–102.

Appendix

Table A1. Composite Prosperity Index of China's Export E-commerce

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014	35.52	39.67	46.32	47.32	53.41	56.72	68.73	73.33	68.22	74.37	102.23	133.85
2015	100.00	92.75	113.34	130.57	143.63	187.55	209.75	193.95	173.13	198.97	269.94	372.25
2016	217.67	202.89	274.50	301.94	317.31	338.73	385.75	362.68	320.11	317.89	503.49	527.22
2017	265.60	258.10	301.63	354.13	443.56	NA	NA	NA	NA	NA	NA	NA

Table A2. Supplier Amount Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014	60.98	60.98	60.98	65.85	68.29	73.17	82.93	80.49	82.93	87.80	92.68	97.56
2015	100.00	104.88	109.76	107.32	121.95	126.83	131.71	126.83	131.71	131.71	148.78	153.66
2016	165.85	180.49	185.37	175.61	182.93	175.61	185.37	195.12	200.00	202.44	219.51	217.07
2017	207.32	204.88	207.32	207.32	214.63	219.51	NA	NA	NA	NA	NA	NA

Table A3. Supplier Volume Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014	26.88	35.05	48.15	45.18	54.26	55.45	66.87	77.38	66.01	71.51	111.94	156.17
2015	100.00	88.04	106.10	120.97	118.77	157.14	166.16	151.28	124.49	129.81	181.14	225.76
2016	124.63	112.51	154.08	191.34	199.33	219.00	228.18	188.93	156.10	144.89	173.24	200.38
2017	113.62	109.48	146.00	186.46	235.47	221.98	NA	NA	NA	NA	NA	NA

Table A4. Sales Volume Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014	16.39	21.37	29.36	29.75	37.05	40.57	55.46	62.28	54.74	62.79	103.75	152.36
2015	100.00	92.34	116.45	129.82	144.84	199.30	218.85	191.87	163.96	170.97	269.50	346.90
2016	206.70	203.07	285.61	336.01	364.62	384.58	422.97	368.64	312.21	293.31	380.28	434.96
2017	235.56	224.31	302.68	386.56	505.39	487.28	NA	NA	NA	NA	NA	NA

Table A5. Logistics Facilitation Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2016	NA	NA	NA	NA	100.00	188.16	135.01	110.51	100.86	105.52	121.45	107.31
2017	117.57	113.16	129.17	171.63	124.30	NA	NA	NA	NA	NA	NA	NA

Table A6. Customs Facilitation Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2016	100.00	50.02	55.58	51.25	72.93	89.81	83.07	61.13	42.82	74.96	64.77	58.19
2017	88.94	53.48	33.83	36.37	NA	NA	NA	NA	NA	NA	NA	NA

Table A7. Manufacturing Cost Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	99.26	128.65	145.78	160.51	239.97	246.95	222.92	178.25	200.44	301.33	463.49
2016	205.67	196.53	289.45	331.77	337.66	374.20	445.69	345.46	300.38	266.40	346.95	443.83
2017	219.79	206.65	294.79	360.51	501.92	NA	NA	NA	NA	NA	NA	NA

Table A8. Transporting Cost Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	103.48	142.59	153.34	169.62	260.65	297.19	263.36	224.68	241.69	337.02	619.00
2016	324.37	292.36	426.92	498.39	536.09	567.98	643.25	583.95	472.96	431.71	509.43	618.23
2017	385.46	252.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A9. Warehousing Cost Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	90.25	99.45	121.20	145.98	138.57	173.89	195.48	187.26	297.31	335.84	360.07
2016	240.33	201.26	258.61	236.21	243.02	261.83	343.89	446.42	448.41	535.66	1361.16	1163.71
2017	378.63	485.43	360.96	403.91	434.66	NA	NA	NA	NA	NA	NA	NA

Table A10. Marketing Cost Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	72.21	92.55	134.76	138.98	190.34	227.87	197.56	189.22	196.66	288.82	409.21
2016	233.57	214.51	296.67	326.66	338.88	368.95	402.05	364.35	303.29	291.70	376.67	476.05
2017	274.14	264.93	483.96	568.17	770.23	NA	NA	NA	NA	NA	NA	NA

Table A11. Composite Risk Index of China's Export E-commerce

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	122.82	123.09	146.62	158.25	146.72	147.16	187.48	232.63	271.76	219.92	240.63
2016	95.29	98.71	92.68	96.35	98.13	101.97	103.04	108.04	123.11	123.38	125.07	129.30
2017	103.08	116.29	117.35	114.73	125.81	NA	NA	NA	NA	NA	NA	NA

Table A12. Tariff Payment Risk Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2016	100.00	91.20	98.17	94.53	78.10	37.94	97.62	96.94	104.34	64.53	92.02	97.71
2017	70.61	93.60	189.06	138.44	NA	NA	NA	NA	NA	NA	NA	NA

Table A13. Products Sales Risk Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2014	NA	NA	NA	NA	NA	NA	NA	117.69	138.02	125.28	129.47	131.81
2015	100.00	112.43	105.47	123.29	140.14	120.32	129.25	168.28	215.46	244.87	181.89	210.19
2016	87.48	93.88	79.33	87.62	95.08	107.35	98.28	112.18	135.04	136.42	129.03	139.99
2017	99.51	114.54	114.25	113.75	106.15	NA	NA	NA	NA	NA	NA	NA

Table A14. Enterprise Profit Risk Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	96.94	99.25	106.03	103.08	103.96	103.81	105.20	103.29	108.41	111.68	108.11
2016	104.74	100.06	100.75	101.12	99.52	99.92	104.60	102.19	105.55	106.68	109.29	107.49
2017	107.68	109.60	106.22	105.02	102.21	NA	NA	NA	NA	NA	NA	NA

Table A15. After-sales Refund Risk Index

Year	January	February	March	April	May	June	July	August	September	October	November	December
2015	100.00	78.98	69.70	66.49	71.30	59.34	72.89	70.43	69.65	57.51	45.29	52.88
2016	92.55	71.08	65.31	70.05	74.11	83.42	76.38	81.59	73.94	72.17	50.97	54.96
2017	86.35	61.58	62.32	61.97	69.37	NA	NA	NA	NA	NA	NA	NA

Note: NA, not available.

(Edited by Yuanfang Li)