

# The Impact of Cross-Border E-Commerce Policy on Imports: Evidence From China

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## ABSTRACT

In the era of the digital economy, cross-border e-commerce is a specific embodiment of “internet plus international trade.” Based on the promoting policy of “The product lists of cross-border e-commerce retail imports” and Chinese customs transaction data, this study uses a difference-in-differences methodology to analyze the effects of cross-border e-commerce on China’s import trade. The results show that the implementation of the cross-border e-commerce policy has significantly contributed to the growth of import value, price, and quantity. The promoting effects mainly derive from the intensive margin of imports and the extensive margins of importing source countries. Digital technology and development determine the policy’s effectiveness. The heterogeneous effects of import source countries and domestic import regions imply an enlarging inequality effect from cross-border e-commerce and the digital economy.

## KEYWORDS

China, Consumption, Cross-Border E-Commerce, Import, Digital Technology

## 1. INTRODUCTION

With the widespread application of digital technology, cross-border e-commerce (CBEC) has become a fast-growing and high-potential mode of international trade. According to the United Nations Conference on Trade and Development (UNCTAD), global e-commerce sales reached almost \$26.7 trillion in 2019, corresponding to about 30% of the world’s GDP. China’s e-commerce sales are a third of the world’s and reached \$2,604 billion in 2019<sup>1</sup>. This study takes China as an example to investigate the implementation of CBEC policy, examine its impact on international trade, and provide policy implications for the development of global e-commerce.

The improvement in China’s internet infrastructure and the accelerated pace of upgraded consumption have led to a rapid growth of Chinese consumers’ demand for imported goods. As a result, China’s CBEC retail imports exceeded 100 billion RMB in 2020, and more than 10,000 firms were registered by the end of 2021<sup>2</sup>. In 2016, the Chinese government implemented a related policy on CBEC retail imports and released a *list of cross-border e-commerce retail goods*. The policy has

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facilitated customs clearance; tax exemptions are eliminated; and the goods included in the list are subject to zero tariffs within a specific limit. This study aims to investigate the effects of CBEC policy on consumption behavior, focusing on China's imports.

Based on the enactment of a CBEC policy and Chinese customs transaction trade data, this paper uses a difference-in-differences methodology to analyze the impact of CBEC on China's import behavior. This study shows that CBEC policy significantly promotes China's import value, price, and quantity. The promoting effects mainly come from the intensive and extensive margins of the expansion of import-sourcing countries rather than the enrichment of product variety. The effects are also determined by the level of development of digital technology in both import source countries and domestic importing regions. The implementation of CBEC policies also exhibits heterogeneous effects for different product categories, import source countries and domestic importing regions with different income levels.

The main contributions of this study are as follows: First, our study focuses on the consumption perspective and investigates the impact of CBEC on imports. Most studies have examined the impact of CBEC on exports from the supply perspective. It has been argued that CBEC has weakened the impact of geographical distance on international trade (Blum & Goldfarb, 2006; Du et al., 2022) and decreased export costs, such as the reduction of fixed costs, operational costs, and information costs of entering a new market through e-commerce platforms (Fink et al., 2005; Fan et al., 2018; Terzi, 2011). This gives small- and medium-sized firms more opportunities to participate in international trade (Ma et al., 2018, 2021; Zhang & Erturk, 2022) and increases the probability of export (Freund & Weinhold, 2004). However, importing consumers can access a wider variety of products through e-commerce platforms, overcome information asymmetry, and reduce search costs (Lendle et al., 2016). Translation features, user ratings, and platform feedback mechanisms significantly reduce information costs (Chen & Wu, 2021; Brynjolfsson et al., 2019; Tadelis, 2016). Additionally, search engines improve search efficiency and reduce search costs (Dinerstein et al., 2018; Jolivet & Turon, 2019; Goldfarb & Tucker, 2019). Our study is based on the semi-natural experiment of China's CBEC policy, including the release of CBEC product lists and the related tax reduction implemented in 2016. Therefore, the paper examines its causal effects on imports and discusses the mechanisms regarding the import price, quantity, and intensive and extensive trade margins.

Second, our study contributes to the literature on the trade effects of digital technologies. The Internet, e-commerce, and other digital technologies have significantly contributed to the growth of international trade (Freund & Weinhold, 2002, 2004; Zhu et al., 2019). In our study, the authors analyze the impact of digital technologies on e-commerce trade from a bilateral perspective by considering both the import-sourcing countries and the domestic importing regions and shed light on the discussion of the "digital divide." Our paper reveals that the trade promotion effect of CBEC increases with digitalization and economic development of importing countries and domestic regions. This may further widen the gap between and within a country because international trade can affect consumer welfare by influencing product price, variety, and quality (Hottman & Monarch, 2020; Atkin et al., 2018; Broda & Weinstein, 2006; Benkovskis & Wörz, 2014). Additionally, differences in the market structure and infrastructure across regions can result in an unequal distribution of trade welfare (Marchand, 2012; Han et al., 2016). The development of CBEC is hindered by weaker digital infrastructure in developing countries and domestic low-income areas, exacerbating consumption inequality.

The remainder of this study is organized as follows. Section 2 reviews the policies related to CBEC. Section 3 presents the data and introduces the empirical approach. Sections 4, 5, and 6 present the empirical results, robustness checks, and heterogeneous analyses. The final section concludes this study.

## 2. POLICY BACKGROUND

To promote the healthy and orderly development of CBEC, in April 2016, China implemented a new tax reform for CBEC retail imports and released the accompanying *list of cross-border e-commerce*

*retailing goods*. The main objectives of this policy are as follows. First, it guides return on foreign consumption and activates the domestic consumer market. Second, it creates a legal and regulated channel to purchase goods abroad. Third, it facilitates customs procedures on cross-border transactions and improves customs clearance efficiency. Table 7 in the Appendix presents the policies in details.

Regarding taxation policy, goods imported through CBEC are no longer subject to postal tax as postal articles but to tariffs, import VAT, and consumption tax. A zero tariff is applied within a specific limit, and import VAT and consumption tax are levied at 70% of the statutory taxable amount. The single transaction limit is initially set at RMB 2,000, and the annual individual transaction limit is RMB 20,000<sup>3</sup>. The full amount is taxed as general trade for transactions exceeding the single transaction limit or the individual annual limit.

Regarding the scope of applicable goods, a list of CBEC retail import goods has been released. Only goods on this list can be imported through the CBEC mode and are subject to CBEC retail import tax policy. Since its release in April 2016, the list was adjusted in November 2018, December 2019, and March 2022, with the number of items gradually increasing from 1,240 to 1,476.

Regarding the regulatory approach, CBEC retail imports are regulated as inbound self-use items, with no mandatory initial import license approval, registration, or filing requirements. Thus, it provides easier customs clearance procedures and faster circulation of goods imported through CBEC.

The e-commerce policy may affect China's imports through the following aspects. First, the tax policy reform changes the tax cost of products, which affects import prices. After the tax reform, pre-existing tax exemptions were abolished, increasing the tax cost on low-priced goods. For example, in the cosmetics category, the tax rate rose by 32.9% for cosmetics priced at less than RMB 100, while it fell by 17.1% for cosmetics priced at more than RMB 100. Thus, under the same category of goods, the tax cost of high-priced goods decreases, whereas that of low-priced goods increases. Second, the positive list strictly limits the categories of goods imported by CBEC, which restricts the growth in product variety. Third, the policy unifies customs clearance standards and optimizes the clearance process and efficiency. The improvement of trade facilitation is conducive to the growth of import quantities.

### 3. DATA AND EMPIRICAL STRATEGY

#### 3.1 Estimation Specification

To empirically test the impact of CBEC policies on China's import, this paper estimates the following equation using a difference-in-differences methodology:

$$\ln y_{idpt} = \alpha_0 + \beta_1 treat_i \times post_t + \gamma X_{it} + \mu_i + \tau_{dt} + \gamma_{pt} + \varepsilon_{it} \quad (1)$$

where subscript  $i$  refers to the 8-digit HS (abbreviation for The Harmonized Commodity Description and Coding System) product,  $d$  denotes the import source country,  $p$  denotes China's import province, and  $t$  is the time (year). The dependent variable is the import value, which takes a logarithmic form. The difference-in-differences setting includes the product and time differences.  $treat_i$  is a dummy variable to identify the treatment group, which takes 1 if the product is contained in the list of CBEC retail imports and 0 otherwise.  $post_t$  is a dummy variable that takes a value of 1 in and after the year of the CBEC policy implementation in 2016.  $\beta_1$  is the main coefficient to be estimated, which captures the impact of the CBEC policy on China's import behavior. It compares the imports of goods affected and unaffected by the CBEC policy before and after the enactment of the CBEC policy.  $X_{it}$  controls the product tariffs. This paper also controls for a set of fixed effects.  $\mu_i$  represents the product

fix effect at the 8-digit HS product code level.  $\tau_{dt}$  is the destination-year fixed effect.  $\gamma_{pt}$  is province-year fixed effect.

### 3.2 Data

The import data are obtained from the China General Administration of Customs. It covers the years from 2012 to 2019 and includes the variables of import value, price, 8-digit HS product code, trade mode, the import source country (or region), and domestic province.

This study uses the release of *the list of cross-border e-commerce retail goods* as a policy shock to analyze the impact of e-commerce policies on import behaviors. On April 7, 2016, China's Ministry of Finance issued a list of CBEC. The authors manually collected the 8-digit HS product code in the list and merged it with the customs data to identify the treatment group of the affected product of the 8-digit HS product code. There were approximately 1,240 products in the treatment group and 7,055 in the control group.

## 4. EMPIRICAL RESULTS

### 4.1 Baseline Results

An analysis was conducted according to Equation (1) to examine the impact of CBEC policies on China's imports. The baseline results are presented in Table 1<sup>4</sup>. Column (1) shows that the coefficient of import value is significantly positive after controlling for tariffs and all the fixed effects. The results indicate that, compared to the products which are not included in the list, the affected products show a significant increase in imports after the release of the CBEC policy (compared to before the policy enactment). This implies that the implementation of the CBEC policy is conducive to the growth of China's import value.

Additionally, the authors divide the value of imports by quantity and price. The import quantity is the quantity of each imported product. The import price is the average price of each imported product at 8-digit HS product code level, calculated by dividing the import value by the import quantity. The

Table 1. The baseline results

Variables	(1)	(2)	(3)
	Value	Quantity	Price
treat*post	0.067***	0.129***	0.083***
	(0.01)	(0.00)	(0.00)
Tariffs	-0.002***	-0.001***	-0.002***
	(0.00)	(0.00)	(0.00)
Product fixed effects	Y	Y	Y
Destination-year fixed effects	Y	Y	Y
Province-year fixed effects	Y	Y	Y
No. of Observations	5,618,728	4,937,794	4,937,794
R-squared	0.344	0.975	0.946

Notes: Robust standard errors are in parentheses. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

regression results are in Columns (2) and (3) of Table 1. The regression coefficient is significantly positive for both quantity and price.

A possible explanation is that the implementation of the policy has optimized the customs clearance process and improved trade facilitation, thus promoting the growth of import quantity. Additionally, the tax policy reform led to a decrease in the tax cost of high-priced goods. Since product prices are highly correlated with product quality (Hallak & Schott, 2011), the relative cost of purchasing high-quality goods in the same category of products decreases, promoting a shift in consumer demand from low-to high-quality products. Therefore, an increase in import prices may be due to increased product quality. This finding is also consistent with the reality that China is amidst a consumption upgrade and that the implementation of CBEC policies has met the consumption demand of Chinese consumers for high-quality goods.

#### 4.2 Trade Margins

Import value can be decomposed into intensive and extensive margins. Intensive margin is measured by the average amount of continuous import for each 8-digit HS product. The extensive margin is measured by the number of imported product categories and the number of importing source countries for each product category. The two margins were used as explained variables and regressed based on Equation (1). The results are shown in Table 2, in which the coefficients of the intensive margin are significantly positive. The coefficient of the extensive margin on the number of product categories is significantly negative, and the coefficient of the number of import source countries is significantly positive. The results show that the enhancing effects of the e-commerce policy on Chinese imports are mainly due to the expansion of the existing product scale rather than an increase in product variety. A possible reason is that the promotion policy takes the form of a positive list system, and only the products included in the list can enjoy the corresponding policy benefits. Therefore, the restriction of the product scope is unfavorable to the growth of product variety. However, the regression results in Column (3) show that the margin of expansion, defined by the number of import source countries, is significantly positive, indicating that although the variety of imported products has been restricted, the sourcing countries for imports have expanded significantly.

Table 2. Impacts on import margins

Variables	(1)	(2)	(3)
	Intensive margin	Extensive margin (product variety)	Extensive margin (import source)
treat*post	0.105***	-0.008***	0.062***
	(0.00)	(0.00)	(0.00)
Control variables	Y	Y	Y
Product fixed effects	Y	Y	Y
Destination-year fixed effects	Y	Y	Y
Province-year fixed effects	Y	Y	Y
Observations	5,302,016	5,618,728	5,618,728
R-squared	0.970	0.995	0.972

Notes: Robust standard errors are in parentheses. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

### 4.3 Robustness Check

To ensure the robustness of the empirical results and the effectiveness of the policy, this study conducts the parallel trend test and robustness checks on the following aspects: (1) testing the pre-trend of the policy; (2) only considering consumer goods imports; (3) excluding data where the 6-digit HS product code changed during the sample period; (4) controlling for the effect of trade agreements; (5) controlling for other policies; and (6) expanding the sample period from 2012 to 2019.

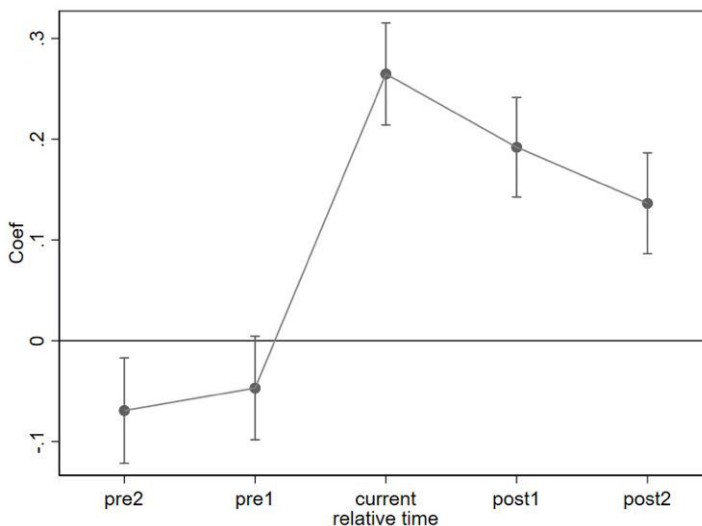
First, in the main DID regression, the authors use the year dummy *Post* to separate the pre- and post-policy periods. The estimation from the interaction policy term yields the average treatment effects by comparing the mean differences between the treatment and control products and between the pre- and post-policy of CBEC. To test the pre-trend assumption of the DID setting, the paper comes up with a series of year dummies during the 2012-2018 period and then interacts these dummies with the treatment indicator based on the baseline specification Equation (1). Figure 1 plots a series of estimated coefficients for the policy terms, illustrating the variations in imports between the treatment and control products over time. The paper finds that the treatment and control products were balanced in import value prior to 2016, indicating product comparability between these two groups conditional on a set of controls. However, during the post-2016 period, the treated products begin to experience an increasing trend in imports.

Second, according to the classification by Broad Economic Categories (BEC), consumer goods account for more than 80% of CBEC listed products. Thus, the study restrains the observations to consumer goods and takes the control group as unaffected consumer products not on the list as a robustness check. The results are presented in the first column of Table 3. The policy coefficients are still positive and significant.

Third, during the sample period, the 6-digit HS product code was adjusted for 2017. To avoid interference from coding adjustments, the paper identifies the categories where the 6-digit HS product code changes and excludes the data for the robustness check. The results are presented in Column (2) of Table 3 and remain significant.

Fourth, trade agreements may enhance economic and trade cooperation between countries. Therefore, the study includes a control variable for trade agreements to control for the effect on China's imports, which takes the value of 1 if the destination country has a trade agreement with

Figure 1. The test for the pre-trend assumption (Notes: The solid line captures the estimated coefficient of the policy on import value. The dashed lines represent the 95% confidence intervals of the estimated effects.)



China, and 0 otherwise. The lists of the trade agreement can be found in Table 8 of the Appendix. The paper also adds destination fixed effects. The result is consistent with the baseline result and is presented in Column (3) of Table 3.

Fifth, in terms of CBEC imports, in addition to the CBEC policy on import product lists, the Chinese government implemented the e-commerce pilot city policy in 2012 to promote trade<sup>5</sup>. Pilot cities can enjoy a series of trade facilitation measures, which are conducive to expanding the trade openness (Zhong et al., 2022). Each province’s cumulative number of pilot cities per year is used as a control variable to proxy for this regional policy. The results are presented in Column (4) of Table 3 and are consistent with the baseline results.

Last but not least, the study expands the sample period from 2012 to 2019, during which the CBEC policy was adjusted twice in 2016 and 2018 (the actual effective date is January 2019, with 81 additional products categories). The study conducts an empirical test using a time-varying differences-in-differences (DID) model and the result shown in Column (5) is consistent with the baseline. Thus, all of the results from the robustness checks above demonstrate that CBEC policies significantly contribute to China’s import trade growth.

## 5. THE ROLE OF THE DEVELOPMENT IN THE DIGITAL ECONOMY

The level of digital technology is crucial to e-commerce development. This section discusses the moderating role of digital technology in the relationship between CBEC and imports from the perspective of both importing source countries and domestic importing regions.

The study analyzes the role of digital technologies in imports from a supply-side perspective. Digital technology levels in import source countries are measured using the ICT Development Index (IDI Index) from the Information Society Report published by the International Telecommunication Union. The import source countries are divided into three groups: high,

Table 3. Robustness checks

Variables	(1)	(2)	(3)	(4)	(5)
treat*post	0.134***	0.069***	0.054***	0.071***	0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Trade agreement			0.124***		
			(0.02)		
Control variables	Y	Y	Y	Y	Y
Product fixed effects	Y	Y	Y	Y	Y
Destination-year fixed effects	Y	Y	N	Y	Y
Province-year fixed effects	Y	Y	Y	N	Y
Destination fixed effects	N	N	Y	N	N
Province fixed effects	N	N	N	Y	N
Observations	3,581,348	5,014,607	5,618,757	5,618,728	6,496,421
R-squared	0.334	0.355	0.346	0.343	0.352

Notes: Column (1) only considers consumer goods imports; Column (2) excludes data where the 6-digit HS product code changes during the sample period; Column (3) controls for the effect of trade agreements; Column (4) controls for the impact of other policies; Column (5) expands the sample period from 2012 to 2019. Robust standard errors are indicated in parentheses. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

medium, and low, based on the IDI index. IDI index above 0.7 is classified as high level, less than 0.7 but higher than 0.5 is classified as medium level, and less than 0.5 is classified as low level. Columns (1) and (2) of Table 4 show that the coefficients are significantly positive, indicating that CBEC policies can increase the value of China's imports from countries with higher levels of digital development. Cross-border e-commerce platforms connect the world into a large unified marketplace, provide relatively complete and efficient information, and reduce information asymmetry (Gomez-Herrera et al., 2014). On the supply side, digital technologies improve the efficiency of financial services, provide financial support to firms (Agyapong, 2021), and effectively reduce trade costs (Chaney, 2014), significantly reducing barriers to accessing international markets. Therefore, the higher the level of digital technology in import source countries, the more domestic companies engage in CBEC.

The paper groups the regressions according to the digitization level of China's importing provinces. The digitization level is measured using the Digital Economy Index (DEI)<sup>6</sup>. The provinces are ranked according to their digital economy index. The top ten are defined as high level, the bottom ten as low level, and the middle as medium level. The results are shown in Columns (3)–(5) of Table 4. For provinces with a high digitization level, CBEC can significantly increase import trade. It has no significant effect on provinces with poor digitization levels. On the demand side, digital tools such as search engines enable consumers to obtain more detailed information on products and stimulate consumption demand (Brynjolfsson et al., 2011). Additionally, provinces with a high level of digitization have a relatively well-developed digital infrastructure, a high percentage of Internet users, and many consumers engaged in e-commerce. Therefore, CBEC transactions are easier to conduct.

Therefore, for both the supply side (import source countries) and the demand side (domestic importing provinces), the promotion effect of CBEC on imports depends on the level of local digitization, and the promotion effect is enhanced as digital development increases.

**Table 4. The role of digital technology in import source countries and domestic regions**

Variables	Import Source Countries			Importing Provinces		
	(1)	(2)	(3)	(4)	(5)	(6)
	High	Middle	Low	High	Middle	Low
treat*post	0.138***	0.071***	-0.026	0.082***	0.132***	0.009
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.03)
Control variables	Y	Y	Y	Y	Y	Y
Product fixed effects	Y	Y	Y	Y	Y	Y
Destination-year fixed effects	Y	Y	Y	Y	Y	Y
Province-year fixed effects	Y	Y	Y	Y	Y	Y
Observations	3,974,610	1,061,077	517,941	4,507,968	905,319	203,929
R-squared	0.370	0.373	0.429	0.346	0.375	0.508

Notes: An IDI index above 0.7 is classified as high level. Less than 0.7 but higher than 0.5 is classified as medium level, and less than 0.5 is classified as low level. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01



## 6. HETEROGENEITY ANALYSIS

Some heterogeneous analyses are conducted based on import source countries, domestic regions, and product categories. First, import source countries are divided into developed and developing countries according to the Human Development Index (HDI) published by the United Nations Development Planning Office<sup>7</sup>. As shown in Column (1) of Table 5, imports from developed countries increased significantly after the enactment of the CBEC policy. Still, there is no significant impact on developing countries as shown in Column (2). A possible reason is that, on the one hand, the digitization level of developed countries is generally advanced (Murthy et al., 2021), and the previous regression results prove that CBEC has a more significant impact on import promotion in regions with a high level of digitization. On the other hand, developed countries can provide more high-quality goods relative to developing countries, which is conducive to meeting Chinese consumers' demand for high-quality goods in the context of consumption upgrading.

Second, according to the classification criteria of the National Bureau of Statistics, Chinese provinces are categorized into eastern, central, and western regions<sup>8</sup>. CBEC has significantly increased import value in the central and east regions as shown in Columns (3) and (4) of Table 5, but not in the western region as shown in Column (5). CBEC depends on regional infrastructure development, including digital and physical infrastructure such as roads and highway systems. The eastern and central regions have relatively well-developed infrastructure, more convenient communication and logistics services, relatively higher income levels of residents, and greater demand for imported goods, which are conducive to developing CBEC on imports.

Third, the study conducts a heterogeneous analysis using product categories. Consumption goods can be categorized into four main types: food, clothing, household equipment, educational and recreational goods. Table 6 demonstrates the promoting effects of CBEC policies on various consumption goods. The import value of food products decreases significantly, but that of clothing, household equipment, and educational and recreational goods increases significantly. This reflects the consumption upgrading trend of Chinese consumers, gradually shifting from subsistence consumption to developmental consumption, and shows that CBEC policy has further stimulated Chinese consumption demand for high-quality imported goods.

Table 5. Heterogeneous effects of the economic development

Variables	Import Source Countries		Domestic Provinces		
	(1)	(2)	(3)	(4)	(5)
	Developed	Developing	East	Central	West
treat*post	0.107***	0.008	0.089***	0.171***	-0.037*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Control variables	Y	Y	Y	Y	Y
Product fixed effects	Y	Y	Y	Y	Y
Destination-year fixed effects	Y	Y	Y	Y	Y
Province-year fixed effects	Y	Y	Y	Y	Y
Observations	4,409,910	1,161,454	4,688,440	509,723	419,035
R-squared	0.357	0.380	0.348	0.411	0.429

Notes: Robust standard errors are in parentheses. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Table 6. Heterogeneous effects by product categories

Variables	(1)	(2)	(3)	(4)
	Food	Clothing	Household Equipment	Educational and Recreational Goods
treat*post	-0.164***	0.231***	0.063***	0.070**
	(0.02)	(0.01)	(0.01)	(0.01)
Control variables	Y	Y	Y	Y
Product fixed effects	Y	Y	Y	Y
Destination-year fixed effects	Y	Y	Y	Y
Province-year fixed effects	Y	Y	Y	Y
Observations	213,437	841,017	1,395,681	1,478,183
R-squared	0.429	0.338	0.350	0.330

Notes: Robust standard errors are in parentheses. \* p<0.1,\*\* p<0.05, \*\*\* p<0.01

## 7. CONCLUSION

This study analyzes the impact of CBEC on China’s imports. The results show that the implementation of CBEC policies has significantly contributed to the growth of China’s imports. Regarding trade margin analysis, the rise in import value comes from the growth of the intensive and extensive margins in the number of import countries rather than an increase in product variety. The increase in import value comes from a combination of import quantity growth, price increases, and quality improvements. Additionally, the contribution of CBEC to imports depends on the level of digital technology development in both importing source countries and domestic importing regions. CBEC also impacts imports heterogeneously, and CBEC stimulates import sourcing from developed countries and import demand from domestic consumers in the eastern and central regions, which may induce an increase in consumption inequality.

CBEC plays a positive role in promoting the development of international trade. Based on this study’s findings, the paper proposes the following policy implications. First, the implementation of trade facilitation measures is conducive to developing CBEC, specifically through developing a comprehensive taxation system, improving the customs clearance process and efficiency, and establishing a corresponding risk prevention and supervision system. Second, the findings reveal that digital technology plays a pivotal role in promoting the growth of CBEC. Therefore, it is necessary to vigorously develop digital infrastructure and reinforce the technological foundation for CBEC development. Finally, CBEC may also enlarge the inequality among countries and within a country, such as China and other developing countries. The development of CBEC is based on the internet infrastructure. Therefore, increasing investment in digital facilities and infrastructure construction in developing countries and domestic remote and under-development areas, will be conducive to avoiding the emergence of the digital divide.

This paper mainly relies on China’s customs trade data to investigate the impact of CBEC on the import behavior. However, in the era of the digital economy after the pandemic, individual firms may behave heterogeneously. Therefore, future research will rely on firm-level data to study CBEC trade and determine the effects of e-commerce on firm size, ownership, productivity, and technology level.

## **COMPETING INTERESTS**

All authors of this article declare there are no competing interest.

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## ENDNOTES

- <sup>1</sup> [https://unctad.org/system/files/official-document/tn\\_unctad\\_ict4d18\\_en.pdf](https://unctad.org/system/files/official-document/tn_unctad_ict4d18_en.pdf)
- <sup>2</sup> Data from the Ministry of Commerce of the People's Republic of China.
- <sup>3</sup> From January of 2019, the single transaction limit has increased to RMB 5,000, and the yearly individual transaction limit has increased to RMB 26,000.
- <sup>4</sup> To exclude the effects of China-US trade war that started in 2018, we drop the bilateral import from US in our baseline regression.
- <sup>5</sup> The implementation of CBEC retail import pilot cities began in 2012, and by 2020, has covered more than 50 cities. Pilot cities can carry out online bonded import business (1210 mode) under regulatory conditions. In this mode, e-commerce companies deposit overseas goods in advance in the customs bonded warehouse. After the domestic consumers buy the goods in the e-commerce platform, the goods will be issued from the domestic bonded warehouse, so that the goods can be quickly delivered to consumers to improve the consumer experience.
- <sup>6</sup> Data obtained from Caixin Media.
- <sup>7</sup> The HDI is composed of the life expectancy index, education index, income index, gender development index, and gender inequality index, and reflects the quality of life of a country (or region) to a certain extent. The HDI above 0.8 are considered developed countries, while the rest are considered developing countries.
- <sup>8</sup> The eastern regions include Beijing, Tianjin, Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong, and Guangdong provinces. The central regions include Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan provinces. The western regions include Inner Mongolia Autonomous Region, Guangxi Zhuang Autonomous Region, and Chongqing, Sichuan Province, Guizhou Province, Yunnan Province, Tibet Autonomous Region, Shaanxi Province, Gansu Province, Qinghai Province, Ningxia Hui Autonomous Region, and Xinjiang Uygur Autonomous Region.

## APPENDIX

Table 7. Introduction of CBEC policy

	Policy Schedule	Policy Content	Policy Interpretation
Tax Policies	In April 2016, the Notice on Taxation Policies for CBEC Retail Imports was released	Goods imported through CBEC will no longer be subject to postal tax but will be subject to the tariff, import VAT, and consumption tax  Single transaction limit and annual transaction limit for individuals are set. The single transaction limit for cross-border retail imports is RMB 2,000, and the annual transaction limit for individuals is RMB 20,000. If the value exceeds the limit, the full amount of tax will be levied according to the general trade mode.	Before the tax reform: goods were subject to travel tax as personal incoming mail items and enjoyed an exemption amount of less than RMB 50  After the tax reform: the exemption amount is abolished; the tariff rate is set at 0%; VAT and consumption tax on imports are levied at 70% of the statutory taxable amount.
	In November 2018, the Notice on Improving the Tax Policy on CBEC Retail Imports was released.	The single transaction limit for CBEC retail imports is increased to RMB 5,000, and the annual transaction limit is increased to RMB 26,000	
Positive Lists	In April 2016, the Notice on the Announcement of the List of Goods for CBEC Retail Imports was released.	The list includes 1,240 items, covering food and beverage, clothing, household appliances, and hot domestic commodities such as cosmetics and health care products.	The lists of CBEC retail imports, also known as the positive lists, refer to implementing the positive list management of CBEC retail import mode; non-listed goods can not be sold in the mode of CBEC retail imports into the country.
	In November 2018, the “CBEC Retail Import Goods List (2018)” was released.	Fitness equipment and other goods have been added to the list, bringing the number of items to 1,321.	
	In December 2019, the “CBEC Retail Import Goods List (2019)” was released.	Frozen aquatic products, alcohol, electrical appliances, and other goods were added, and the number of goods on the list reached 1,413.	
	In March 2022, the “CBEC Retail Import Goods List (2022)” was released.	The list added ski equipment, household dishwasher, tomato juice, and other goods, and the number of goods on the list reached 1,476.	
Regulatory Policies	In May 2016, a transitional policy on regulatory requirements related to CBEC retail imports was introduced.	The policies define the goods imported through CBEC retail as self-use goods and there is no need to implement initial import license approval, registration, or filing requirements.	Before the release of the policy, each customs clearance port had its own customs clearance regulations and category restrictions.  After the release of the policy, the customs clearance ports unified standards and relied on the digital system to automatically compare the declared list to achieve rapid customs clearance. This reduces the difficulty of customs clearance and significantly improves the efficiency.
	In November 2016, the transition period was extended to the end of 2017.		
	In September 2017, the transition period was extended to the end of 2018.		
	In December 2018, the Notice on Improving the Work Related to the Regulation of CBEC Retail Imports was issued.		

Notes: The above information is from the Ministry of Commerce of China and has been organized by the authors.

**Table 8. List of trade agreements with China effective before 2019**

Agreement	Partner Country	Effective Date	Effective Year
Asia-Pacific Trade Agreement	Bengal	2001.5.23	2001
Asia-Pacific Trade Agreement	India	2001.5.23	2001
Asia-Pacific Trade Agreement	Laos	2001.5.23	2001
Asia-Pacific Trade Agreement	Korea, Rep.	2001.5.23	2001
Asia-Pacific Trade Agreement	Sri Lanka	2001.5.23	2001
China and ASEAN Free Trade Area, CAFTA	Indonesia	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Malaysia	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Singapore	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Cambodia	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Brunei	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Vietnam	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Laos	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Myanmar	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Philippines	2009.10.10	2009
China and ASEAN Free Trade Area, CAFTA	Thailand	2010.1.1	2010
Free Trade Agreement	New Zealand	2008.10.1	2008
Free Trade Agreement	Singapore	2009.1.1	2009
Free Trade Agreement	Pakistan	2009.10.10	2009
Free Trade Agreement	Peru	2010.3.1	2010
Free Trade Agreement	Chile	2010.8.1	2010
Free Trade Agreement	Costa Rica	2011.8.1	2011
Free Trade Agreement	Iceland	2014.6.30	2014
Free Trade Agreement	Switzerland	2014.7.1	2014
Free Trade Agreement	Korea, Rep.	2015.12.20	2015
Free Trade Agreement	Australia	2015.12.20	2015
Free Trade Agreement	Georgia	2018.1.1	2018

Source: Ministry of Commerce People's Republic of China

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