China Economic Review 43 (2017) 118–126

Contents lists available at ScienceDirect

China Economic Review

Domestic and international border effects: The cases of China and Japan☆

Kazunobu Hayakawa

Inter-disciplinary Studies Center, Institute of Developing Economies, Wakaba 3-2-2, Mihama-ku, Chiba-shi, Chiba 261-8545, Japan

ARTICLE INFO

Article history:
Received 25 March 2016
Received in revised form 24 January 2017
Accepted 24 January 2017
Available online 26 January 2017

JEL classifications:
F15
F53*Keywords:*
Gravity
Border effects
China

ABSTRACT

Previous studies in the border-effect literature surprisingly found that domestic border effects are larger than international border effects (e.g., in the United States or Brazil). One interpretation of this result is that these estimates include the effects of producer agglomeration. Therefore, in this study, we estimate those border effects exclusively for transactions for final consumption, in which such agglomeration forces will be weak, in China and Japan. As a result, we found larger international border effects and could not find a significant role for producer agglomeration in the estimates of border effects. We also found that China's accession to the World Trade Organization reduces border effects in trading between China and Japan but does not decrease domestic border effects.

1. Introduction

Broadly defined transaction costs that include costs for both domestic and international transactions play a role in shaping the regional distribution of firms' production and locations and thus the direction and magnitude of their transactions. Those domestic costs mainly include physical transport costs. The development of transportation services will have significant effects on such domestic transaction costs. Even apart from physical transport costs, international transactions entail incurring various costs, including policy barriers (e.g., tariffs or non-tariff barriers (NTBs)) and those based on cultural differences. These international transaction costs have been viewed as a major obstacle to international trade.

Based on such a view of their importance, recent academic literature has tried to quantify the costs of domestic and international transactions. McCallum (1995) conducted a pioneering study on the quantification of international transaction costs. Using data on trade among Canadian provinces and between Canadian provinces and U.S. states, he found that cross-provincial trade was 22 times larger than cross-border trade in 1988. Subsequently, due to this abnormally large magnitude, other studies developed an improved method of quantification. For example, Anderson and van Wincoop (2003) derived the gravity equation with "multilateral resistance terms," for which an easy estimation is suggested in Feenstra (2002). At the same time, studies such as Wolf (2000), Hillberry and Hummels (2003), and Daumal and Zignago (2010) quantified domestic transaction costs. These methodologies have been applied to the analysis of many countries.[1]

☆ This research was conducted as part of a project of the Institute of Developing Economies "Development of Geographical Simulation Model and Geo-economic Dataset (I)." I would like to thank Satoshi Inomata, Satoru Kumagai, and Kenmei Tsubota for giving me the data and information necessary for the analysis in this paper. This work was also supported by JSPS KAKENHI Grant Number 26285058. All remaining errors are mine.
E-mail address: kazunobu_hayakawa@ide-gsm.org.

[1] More recently, Coughlin and Novy (2016) theoretically and empirically demonstrate that larger countries are systematically associated with smaller border effects.

http://dx.doi.org/10.1016/j.chieco.2017.01.014

In particular, Coughlin and Novy (2013) estimated both domestic and international transaction costs in the United States under a unified framework. This analysis is carried out by constructing a dataset incorporating three tiers of U.S. trade flows: trade within individual U.S. states (e.g., Minnesota–Minnesota), trade between U.S. states (e.g., Minnesota–Texas), and trade between U.S. states and foreign countries (e.g., Minnesota–Canada). They found larger border effects in domestic inter-regional transactions than in international transactions. Fally, Paillacar, and Terra (2010) found the same results for Brazil. One of the interpretations of this result in Coughlin and Novy (2013) is that those amounts reflect the local concentration of economic activity, i.e., the co-location of producers in supply chains that enables them to exploit informational spillovers, external economies of scale in the presence of intermediate goods, and associated agglomeration effects.[2] Hillberry and Hummels (2003) showed that trade within the United States is heavily concentrated at the local level.

Against this backdrop, and as in Coughlin and Novy (2013), we estimate both domestic and international transaction costs in China and Japan. To do that, we employ a unique dataset, namely the "Transnational Interregional Input-Output Table for China and Japan" compiled by Institute of Developing Economies (IDE). In this dataset, China and Japan are divided into seven and eight regions, respectively. This dataset enables us to identify transactions in these two countries at a more detailed level than the above mentioned dataset used by Coughlin and Novy (2013). Specifically, it includes domestic inter-regional transactions (e.g., Beijing region–Shanghai region), international inter-regional transactions (e.g., Beijing region–Tokyo region), and transactions inside a region (e.g., Beijing region–Beijing region). One point to note is that due to the use of the interregional input–output data between China and Japan, estimated international border effects in China (Japan) are those for imports from Japan (China).

Due to the nature of this dataset, Coughlin and Novy (2013)'s analysis can be refined in terms of two aspects. First, our dataset includes international inter-regional transactions.[3] Due to this inclusion, unlike Coughlin and Novy (2013), we can estimate both international and domestic border effects after controlling for multilateral resistance terms using the method proposed in Feenstra (2002). Second, we can differentiate between final consumption and intermediate use transactions. Therefore, we can estimate the border effects in transactions for final consumption and intermediate use separately. The above-mentioned effects from the local concentration of economic activity will function more strongly in the case of intermediate-goods transactions. In other words, when focusing on the transactions for finished goods or final consumption, we can exclude such effects to some extent. In this separate estimation, we examine whether border effects are different between final consumption transactions and intermediate use transactions.

Finally, our dataset is for 2000 and 2005. China joined the World Trade Organization (WTO) on December 11, 2001. Therefore, the difference in border effects for China between 2000 and 2005 will include the effects of WTO participation. Due to the introduction of most-favored-nation (MFN) rates, international border effects dropped substantially in China. In addition, domestic border effects may be also reduced in China if the WTO participation leads to improvements in logistics services or inward foreign direct investment (FDI) in such services. On the other hand, Japan granted MFN rates to China rather than the higher general tariff rates after China joined the WTO. Therefore, international border effects in Japan vis à vis China will also be reduced. A comparison of our estimates between 2000 and 2005 will provide some evidence of these prior expectations.

The rest of this paper is organized as follows. The next section explains our empirical framework. It essentially follows the specification in Coughlin and Novy (2013), except we control for multilateral resistance terms as mentioned above. Section 3 introduces our unique dataset. In Section 4, we report our estimation results, which show that the domestic border effects are smaller than the international border effects in our sample. Lastly, Section 5 concludes this paper.

2. Empirical framework

To evaluate domestic and international transaction costs, we estimate a gravity equation. Its traditional version has logs for the importer's and exporter's GDPs and a log of distance between trading partners. It is well known that this gravity equation can be supported by various theoretical models. In particular, under an assumption of separable preferences, separable technologies, goods differentiated by country of origin, and symmetric trade costs, Anderson and van Wincoop (2003) derived the following gravity equation:

$$x_{ij} = \frac{y_i y_j}{y^W}\left(\frac{t_{ij}}{\Pi_i P_j}\right)^{1-\sigma} \tag{1}$$

where

$$\Pi_i \equiv \left(\sum_j \left(\frac{t_{ij}}{P_j}\right)\theta_j\right)^{\frac{1}{1-\sigma}}, P_j \equiv \left(\sum_i \left(\frac{t_{ij}}{\Pi_i}\right)\theta_i\right)^{\frac{1}{1-\sigma}}, \theta_i \equiv \frac{y_i}{y^W}$$

[2] As another interpretation, the role of social and business networks has been suggested in the literature (Combes, Lafourcade, & Mayer, 2005; Garmendia, Llano, Minondo, & Requena, 2012; Millimet & Osang, 2007).

[3] For example, Poncet (2003, 2005) and De Sousa and Poncet (2011) estimated the costs for domestic and international transactions in China. Their dataset identified only intra-provincial transactions and each province's transactions with the rest of China.