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International trade and tourism flows: An extension of the gravity model☆

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ABSTRACT

The empirical relationship between trade and tourism has been explored during recent years finding that international tourism promotes international trade between countries. However, the impact of tourism on trade flows has been neglected within standard international trade models such as the gravity equation. The main aim of this paper is to provide empirical and theoretical evidence that tourism matters for international trade. To that end, the framework proposed by Helpman, Melitz and Rubinstein (2008) is used by recognising that tourism flows could reduce fixed and variable costs of exporting. Moreover, once the model is estimated, the empirical evidence suggests that tourism increases both the probability of two countries trading with each other and the volume of international trade between them.

1. Introduction

In recent years, there has been a growing interest in analysing the relationship between international trade and tourism. Empirical papers have tested the relationship between trade and tourism by using cointegration and causality techniques (Kulendran and Wilson, 2000; Shan and Wilson, 2001; Lin and Lee, 2002; Khan et al. 2005 or more recently Santana-Gallego et al., 2010a). A main conclusion is that this empirical nexus seems to exist and it mainly happens in the sense that tourism promotes trade. Indeed tourism may stimulate closer trade relations between countries. However, in spite of this evidence, the impact of tourism on trade has been traditionally neglected within standard international trade models such as the gravity equation.

Tourism, like migration, involves movement of people from the home country to the host one. The empirical evidence of the relationship between trade and migration is well established concluding that larger bilateral migration movements are associated with larger trade flows. For instance, Gould (1994) for the United States, Head and Ries (1998) for Canada, Girma and Yu (2002) for the United Kingdom or Blanes (2005) for Spain find evidence of an empirical link between immigration and bilateral trade using trade gravity models. Literature proposes at least three basic channels for this empirical relationship. First, immigrants bring with them a preference for home-country products (preference channel). Second, immigrants can reduce transaction costs of bilateral trade with their home countries (transaction cost channel).[3] Third, international trade theory states that immigration increases market size promoting not only domestic transactions but also international trade.

Regarding the effect of tourism on trade, similar channels have been suggested but not introduced in a standard international trade model. First, the preference channel is pointed out by Marrocu and Paci (2011) presenting that tourism flows may represent an important and costless information source on external demand preferences, which can help local firms to produce new goods for these international markets. Brau and Pinna (2013) held that travelling involves an exchange of information with a dual content: on local products and on foreign tastes. In this sense, Quinn (2009) analyses how the exposure to foreign products and culture through media and tourist visits affects consumers' preferences for foreign products. Second, the transaction costs channel is found by Kulendran and Wilson (2000) indicating that successful business trips directly promote a flow of exports and/or imports in

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[3] This reduction of trade costs can be explained through immigrant's business connections or personal contacts with his home country (networks) and because of the additional knowledge brought by immigrants about foreign markets and different social institutions which facilitates business dealings (Rauch, 1999; Rauch and Trindade, 2002).

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subsequent periods. Moreover, leisure visitors may identify business opportunities that could lead to further international transactions.[4] Third, the channel of the increased market size is also present in the case of tourism. Khan et al. (2005) stated that tourism might encourage international trade since tourists purchase food, souvenirs, transportation and so on in the foreign country, many of which have to be imported.

The main aim of this paper is to analyse the tourism-link effect on trade in a standard gravity model, focusing on the transaction costs channel. Moreover, a step further is taken by investigating whether tourism affect both intensive and extensive margins of trade. To that respect, Chaney (2008) states that a decrease in the fixed bilateral costs of trade (e.g., start-up costs) would affect the extensive margin (number of firms) while a decrease in the variable trade cost (e.g., ad valorem transport costs) would increase both the extensive and intensive margin, i.e. number of firms and volume of exports, respectively.[5]

After being introduced by Tinbergen (1962), the gravity equation has become one of the most used empirical models of international trade. One of the main traditional critiques to the gravity model is the lack of theoretical underpinnings of the estimated equations. Nevertheless, nowadays international economists recognise that the gravity specification can be supported by Heckscher–Ohlin models, models based in differences in technology across countries, and the models that introduce increasing returns and product differentiation (Deardorff, 1998). One of the most referenced papers on this area is Anderson and Van Wincoop (2003) where the authors developed a well-founded gravity model that provides consistent and efficient estimates by considering both multilateral and bilateral trade resistances. Helpman, Melitz and Rubistein (2008) model, HMR thereafter, generalises the Anderson and Van Wincoop's framework by describing the probability conditions enabling a firm to be an exporter.

The HMR approach presents a theoretical framework to study bilateral trade flows across countries. The main advantage of their approach is that it can explain two regularities in trade data not traditionally considered in empirical trade models: the asymmetry in bilateral trade between country pairs and the high prevalence of zeroes. In this way, their method avoids these two causes of biased estimation of empirical trade models.

In the present paper, tourism is introduced into the HMR model by recognising that it could reduce both fixed and variable costs of exporting, promoting international trade. Moreover, following the estimate procedure proposed by HMR, an empirical exercise is carried out to quantify the importance of tourism on the intensive and extensive margin. To that end, the modified HMR model is estimated for a cross-section that comprises 195 countries in year 2012.

The paper is organised as follows. In Section 2 the links between tourism and trade costs are presented. Section 3 introduces tourism in the HMR framework with the incorporation of a tourism variable. Section 4 presents the empirical analysis where the augmented trade gravity model by including tourism is estimated. Finally, Section 5 draws some conclusions.

[4] In a similar way, tourism could help to mitigate market failures related to information deficiencies regarding favourable productions and contracts (Sinclair, 1998). Also Aradhyula and Tronstad (2003) held that tourism facilitates commercial relations under information failures since it could help to mitigate information deficiencies. These authors find evidence that tourism promotes cross-border trade and highlight the role of governments in promoting international tourism in order to overcome imperfect information related to trade opportunities.

[5] Peri and Requena-Silvente (2010) found that immigrants significantly increase Spanish exports mainly because of the reduction of bilateral fixed costs that increases trade extensive margin. Segura-Cayuela and Vilarrubia (2008) analyse the role of foreign-service (embassies and consulates) on trade flows obtaining that the presence of a foreign service officer in a given country increases the probability of trading with that partner, but there is no effect on the volume of trade with already existing trading partners. The role of tourism on fixed and variable trade cost has not been explored yet.

2. Tourism and trade costs

A simple way to introduce tourism in the HMR framework is by recognising that tourist arrivals can reduce both fixed and variable trade costs. Following Melitz (2003), variable trade costs can be explained by tariffs and transport costs while fixed trade costs are due to several factors such as research of foreign regulatory environment and foreign standards, set up distribution channels in the foreign country, and conform to shipping rules specified by foreign custom agencies.

With respect to fixed trade costs, tourism could reduce cultural distance between countries and, as a consequence, costs associated with the research of foreign standards. Following Deardorff (2014), Tadesse and White (2010) argue that observed transaction costs do not fully explain variation in cross-border trade flows and show that cultural dissimilarity between nations inhibits international trade. Transaction costs that are related to cultural differences between trading partners may not be fully represented by geographic distance or by variables that represent prior colonial relationships. Their results suggest that cultural distance, as a proxy for differences in the norms and values between trading partners, affects negatively to trade flows. In that sense, international tourism may help to mitigate and overcome trade costs since (i) it improves the knowledge about foreign culture and, as a consequence, about business habits and practices in other countries and (ii) facilitates and stimulates to learn other languages, making bilateral trade easier.

Tourism may also reduce fixed trade costs due to gaps of information. According to Sinclair (1998), tourism could help to mitigate market failures related to information deficiencies regarding favourable productions and contracts. Similarly, Arandhyula and Tronstad (2003) find evidence that international tourist arrivals could help to overcome information gaps about market opportunities facilitating new business ventures. Marrocu and Paci (2011) held that tourists transmit relevant information to the local firms which can be exploited to generate a positive impact on the efficiency level of the local economy. On that point, being in contact with tourists suppose an important and costless information source on external demand preferences, which can help local firms to produce new goods for these international markets. Brau and Pinna (2013) argue that the direct contact between tourists and local market could represent a cheap way to promote the domestic supply of particular goods in the international markets than simply activating international marketing activities. Moreover, tourism can facilitate better consumer knowledge and may change consumers' attitudes about foreign cultures, inducing new demand for foreign products.

With respect to variable trade costs, tourism sector requires good basic facilities, services, and infrastructure such as transportation and communication systems that are also necessary for trade. Khadaroo and Seetanah (2008) recognise that good transport infrastructures, i.e. air services, land transport system and routes and water transport infrastructures, are a precondition for the development of tourism and also a determinant of the attractiveness of a tourist destination. Thus, as shown for instance by Khan and Kalirajan (2011), the provision (connectivity) and improvement of transport infrastructures likely leads to reduced transport costs, i.e., lower variable trade costs.

For that reason, we argue that tourism could reduce trade costs and, as a consequence, the minimum productivity making international sales profitable. This last could create new trade links between countries. Also the reduction of trade costs could intensify existing trade links, i.e., could increase international trade between trading partners. Summarising we conjecture that tourism could increase both the extensive and the intensive margins of trade.

3. Econometric modelling

HMR model presents a theoretical framework to study bilateral trade flows across countries. This model extends the classical gravity equation of trade to correct for the large number of zeros in the world

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