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Networks and the disappearance of the intranational home bias

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ABSTRACT

Previous studies have shown that, not only countries, but also regions have a preference to trade within their administrative borders. Using unique trade flows data, we also find a large home bias in Spanish intranational trade. However, we show that this home bias tends to disappear once we take into account the higher density of social and business networks within regions than between regions. We also find that the home bias does not disappear if intranational trade flows are measured in quantity rather than value. This fact might explain why previous studies on other European countries still find an intranational home bias, even when network effects are taken into account.

1. Introduction

In a seminal paper, McCallum (1995) showed that Canadian provinces trade 22 times more with themselves than with US states. This enormous border effect shocked scholars, especially considering that the US and Canada are highly integrated countries. Some years after McCallum's finding, surprisingly, authors found that the preference to trade with oneself was not confined to country borders, but also occurred at the regional level. Wolf (2000) estimated that US states trade on average 200% more within their administrative borders than with other states. In a later work, Hillberry and Hummels (2003) reduced the state border effect to 55%; in any case, the intranational home bias remained very large.

What explains this large intranational home bias? Hillberry and Hummels (2008) argue that the intranational home bias might be an artefact of geographical aggregation. They show that there is a highly non-linear relationship between shipments and distance. At the beginning, there is a sharp reduction in value with distance; however, once a distance threshold is achieved, the negative effect vanishes. In the presence of non-linearity, the choice of the sub-national unit plays a critical role when estimating the border effect. If the sub-national unit is very large (e.g. a US state), data will not be able to capture the sharp reduction in trade that happens at short distances. In this situation, a large border effect is needed to account for the larger trade flows that happen within states. Hillberry and Hummels (2008) show that the intranational home bias shrinks when geographically smaller sub-national units are used for the empirical analysis.[4]

Other authors argue that information barriers may also explain the existence of an intranational home bias. For example, in order to sell their products, firms should gather information about potential customers and their preferences. They also need to gather information about the most suitable ways to distribute the product, and the level of competition in the market. Moreover, firms wish to know whether a potential customer will honor the payments.

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4 Llano et al. (2011) show that non-linearity between distance and trade may also lead to artificially larger country-level border effects.

The gathering of this information will be cheaper if the network of the firm is richer. If firms' managers and other personnel have a large number of links with other professionals, friends or relatives, they will be able to tap into a wider set of information sources. The networking with other managers and professionals will be further facilitated if firms are part of a business group. As firms have a larger number of social and business links in the region where they are located, they will face lower information costs when dealing with local partners, facilitating intra-regional trade flows.[5]

The few empirical studies analyzing intranational trade flows confirm that networks contribute to explaining the home bias effect.[6] For example, Millimet and Osang (2007) show that the US states' border effect is substantially reduced, although not eliminated, when differences in social networks across states are taken into account. Using geographically more disaggregated sub-national units, Combes et al. (2005) also find that social and business networks reduce substantially the intranational home bias in France. However, as in the previous case, a non-negligible intranational home bias remains.

The aim of this paper is to provide new evidence on whether social and business networks can explain the intranational home bias, using Spain as a case study. To perform this analysis, we use a unique database on trade flows, measured both in value and quantity, between highly geographically disaggregated Spanish sub-national units (provinces—NUTS III). We combine trade flows data with data on the density of social and business networks. Our empirical analysis shows that, even when we use highly geographically disaggregated sub-national units, there is a large home bias in Spanish intranational trade. However, contrary to previous studies, ours finds that in almost all estimations the home bias disappears once we control for the links established by migrants and business groups. We also show that the home bias remains if trade flows are measured in quantity instead of value. To explain this result, we show that traded quantities drop faster with distance than traded values. In the case of quantity, provinces might still represent too large a geographical unit for capturing the full non-linearity between distance and trade, leading to an artificial border effect. This result might explain why previous studies, such as Combes et al. (2005), which combine highly geographically disaggregated sub-national units and quantity-based trade flows, still find a sizable intranational home bias after controlling for network effects.

The article is organized as follows. The next section presents the data and offers some descriptive analyses. Section 3 comments on the results of the econometric analyses. Section 4 presents the main conclusions of the paper.

2. Data and descriptive statistics

Data on trade flows between Spanish provinces, measured in value and quantity, come from the C-intereg database (Llano et al., 2010).[7] We proxy social networks by the number of occupied persons born in a Spanish province that live in another Spanish province. This information comes from the Spanish Statistical Institute (INE) Census of Population 2001. Data on business networks are computed from SABI for year 2006. This dataset, produced by the private firm Bureau van Dijk, offers data on the accounts and balance sheets of Spanish firms. Following the norm established by the Spanish General Accounting Plan, we consider that two firms belong to the same business group if a shareholder has at least a 20% participation in both firms, and the shareholder is the primary shareholder in both firms. We identify the firms that belong to the same group in the origin and destination provinces. For each business group we multiply the firms in the origin province by the firms in the destination province to proxy for the total number of firm-links. Then we aggregate each business group's firm-links to get the final origin–destination firm-link figure. Finally, we proxy transport costs by the time spent by a truck (in minutes) in traveling from one Spanish province to another province (Condeço-Melhorado et al., 2011). This time is calculated through a procedure that takes into account, among other factors, the orography, slope and width of the road and speed limits. To calculate distance between and within provinces, Spain is segmented into 815 geographical zones, and the time spent by a truck between every pair of bilateral zones is calculated. Intra-provincial or inter-provincial final distance is calculated as a population weighted average of the bilateral distances that belong to the aggregate distance that we want to estimate. As distance data are based on truck transport, we exclude from the sample the Spanish insular provinces, and the two autonomous cities located in the African continent, leaving us with 47 peninsular provinces.

Table 1
Average values for intranational trade and social and business networks.

	Across provinces		Within a province	
	Exports in value	Exports in quantity	Exports in value	Exports in quantity
Average	120	263	2,094	20,528
Standard deviation	276	731	3,772	20,705
	Migrants	Plant-links	Migrants	Plant-links
Average	1601	194	229,651	3,004
Standard deviation	4655	991	2,793,235	10,070

Note: data on bilateral trade flows in 2007 come from the C-intereg database (value: million €; quantity: thousand tons). Data on migrant workers in 2001 come from the Spanish Statistical Institute. Data on business networks in 2006 were calculated by the authors using data from SABI.

Table 1 presents the average values for trade flows, social networks and business networks between Spanish provinces and within Spanish provinces. A representative Spanish province trades 120 million € with another Spanish province, moving 263,000 tones. The value and the volume of trade are much larger within a province than between provinces. The ratio of intra-province to inter-province trade is 18 for value and 78 for quantity. This difference suggests that the quantity of trade falls faster at short distances than the value of trade. As regards social networks, there are on average 1601 workers that were born in one Spanish province and live in another Spanish province. In contrast, there are on average 229,651 workers that live in the province in which they were born. As regards business networks, there are on average 194 plant-links between two distinct Spanish provinces. The number of plant-links within the same province is much larger: 3004. These figures indicate that both social and business networks exhibit a much higher density level within a province than across provinces; in the next section, we analyze whether these differences lead to larger trade flows within provinces than between provinces.

To analyze whether provinces are sufficiently geographically disaggregated sub-national units for capturing the non-linearity between trade and distance, we use a kernel regression estimator to provide a nonparametric estimate of the relationship between these variables. Fig. 1 presents the relationship between trade

[5] Turrini and van Ypersele (2010) find that judicial asymmetries across regions might also contribute to intranational home bias.

[6] With respect to international trade, there is ample evidence showing that migrant communities, ethnic ties and business groups facilitate trade between countries (Gould, 1994; Rauch and Trindade, 2002).

[7] The database excludes transit trade flows. In a previous version of the paper we use another database, the Permanent Survey of Road Transport, to measure trade flows in quantities, which does include transit flows. The results are very similar to the ones using C-intereg. The results are available on request.