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On home market effects and firm heterogeneity☆

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ABSTRACT

This paper reassesses the home market effect in the light of firm-level heterogeneity. Industries with high barriers to trade, less differentiated products and high productivity dispersion are more likely to concentrate in larger markets. These results differ partly from the predictions of models without selection into exporting. In the presence of economies of scale firms tend to locate in markets where export selection is less competitive. These predictions are confirmed in an empirical investigation based on 34 OECD countries and 118 sectors.

1. Introduction

Countries tend to export goods for which they have relatively large domestic markets. This concept was formally introduced by Krugman (1980) and has become known as the home market effect. The home market effect arises in trade models featuring monopolistic competition, increasing returns to scale, and transport costs. Increasing returns to scale induce firms to locate their production in one place while the larger market allows for minimizing transport costs. Since the larger country has a location advantage vis-à-vis the smaller country this advantage is offset by a higher wage rate at home (Krugman, 1980). In a multi-sector environment the home market effect leads to a concentration of the differentiated product industry in the larger market (Helpman and Krugman, 1985). Allowing for a continuum of differentiated product sectors Hanson and Xiang (2004) generalize this result by showing that the home market effect is more pronounced in industries with high barriers to trade and more differentiated products.[1]

The notion that differentiated product industries tend to concentrate in the larger market is established in the trade and economic geography literature.[2] This assumption has been used as a discriminatory criterion to identify sectors that are subject to increasing returns to scale in the empirical literature (Bruelhart and Trionfetti, 2009; Davis and Weinstein, 1996; 1999; Trionfetti, 2001).

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[1] Weder (2003) conducts a related analysis with many sectors and homogeneous firms. He finds that the home market effect becomes stronger in industries with high fixed costs.

[2] See Feenstra et al. (2001), Head and Ries (2001), Head et al. (2002), Hanson and Xiang (2004) and Crozet and Trionfetti (2008).

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However, all studies confirming the home market effect to be stronger in industries with a high degree of product differentiation are based on homogeneous firm models that do not allow for export selection. This omission is surprising given the fact that there is vast evidence for export selection[3] and this strand of the literature experienced a rapid growth over the last decade.[4]

In this paper, I extend the standard model of monopolistic competition with heterogeneous firms, introduced by Melitz (2003), to a multi-sector framework in order to identify industry characteristics that affect the strength of the home market effect across industries in a setting with export selection. In line with established results, I confirm that industries with high transport costs tend to be subject to a stronger home market effect. However, I find that allowing for selection into exporting causes less differentiated industries to concentrate in the larger market, contradicting previous studies on home market effects such as Hanson and Xiang (2004). Equally, industries with a more dispersed productivity distribution tend to locate in the larger market. The coexistence of export selection and increasing returns introduces a new channel that leads firms to choose locations that provide easier access to foreign markets. As the share of exporters is higher in the smaller country, there is a tendency to locate in the smaller country. The interplay of the elasticity of substitution and the productivity dispersion in an industry determines how strong the selection effect is, reversing the role of the elasticity of substitution in this setting as opposed to a homogeneous firm setting.

The predictions derived in this theoretical model are consistent with an empirical investigation based on a sample of 34 OECD countries and 118 manufacturing sectors over the period 1998–2008. Both the empirical and the theoretical analysis of this paper confirm a negative relationship between the productivity shape parameter – the trade elasticity – and the strength of the home market effect. This result is in line with other empirical studies on home market effects that have found a negative relationship between the presence of home market effects and the trade elasticity (see Crozet and Trionfetti, 2008; Hanson and Xiang, 2004). The difference between these studies and the present paper lies in the structural interpretation of this negative relationship. As pointed out by Chaney (2008), the productivity shape parameter is the structural equivalent of the trade elasticity in a Melitz (2003) model with Pareto-distributed productivity, while it relates to the elasticity of substitution in a homogeneous firm setting. In contrast to previous empirical studies, I measure the elasticity of substitution in an industry by the ratio between revenues and profits using balance sheet data of 306,226 European firms. Consistent with the theoretical prediction, I find the elasticity of substitution to be positively related to the presence of a home market effect.

To my knowledge, only a handful of papers have examined the role of home market effects in a heterogeneous firm setting, but all do so in a setting different from mine. Felbermayr and Jung (2012) find that a home market effect arises in a single-sector environment with export selection even without an outside sector.[5] In their model, the advantage of the larger market leads to both higher wages and a higher market entry probability. Okubo (2009) embeds the Melitz (2003) model into a Ricardian model of comparative advantage with a continuum of sectors as in Dornbusch et al. (1977). Allowing for asymmetries in country size and minimum productivity across countries, he finds that a home market effect à la Krugman (1980) leads to wage rates that are proportional to the market size. Furthermore, he identifies a Helpman-Krugman-type home market effect that is reflected in a more than proportional share of exporters (Helpman and Krugman, 1985). However, in his setting, (Okubo, 2009) is not able to compare the strength of the home market effect across sectors. (Nguyen, 2012) identifies a home market effect in a setting with many differentiated product sectors and one outside good sector producing a homogeneous good that can be freely exported. But, as noted by Crozet and Trionfetti (2008, p. 310), the assumption of the existence of an outside good is 'as much convenient as it is at odds with reality' and as noted by Head and Mayer (2004, p. 2634) even if a constant returns to scale sector exists it 'probably does not have zero trade costs or the ability to absorb all trade imbalances'.[6] I take these concerns on board. Removing the outside good, assuming many sectors with distinct elasticities of substitution, and assuming heterogeneous firms allows me to push the analysis of the home market effect beyond the domain explored by the literature so far.

Since the home market effect is a relative concept, in a setting with several industries, the presence of a home market effect in a certain sector depends on the characteristics of the other sectors in the economy. Here lies the main contribution of the present paper: In a setting with several industries, all of them subject to a home market effect in isolation, I identify which sector characteristics are those that foster a home market effect in equilibrium given a continuum of sectors.

The remainder of the paper is organized as follows. The next section describes the model and investigates the characteristics of the equilibrium. In Section 3, the home market effect is defined and industry characteristics are identified that induce a home market effect. Section 4 provides an empirical assessment of the predictions derived in Section 3. Finally, Section 5 concludes. Technical details can be found in the appendix.

[3] Helpman et al. (2004) show that exporters are more productive than non-exporters and (Eaton et al., 2011) find vast evidence for selection into exporting using French firm-level data.

[4] (Eaton and Kortum, 2002), (Melitz, 2003), (Melitz and Ottaviano, 2008) introduce firm-level heterogeneity in trade models. (Helpman, 2006) provides an overview of this strand of literature.

[5] Note that the definition of a home market effect by Felbermayr and Jung (2012) is based on the relative number of firms.

[6] See also (Davis, 1998) and (Picard and Zeng, 2005) who provide examples of important differences that arise after a more complex treatment of the outside good sector.