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Big vs. small under free trade: Market size and size distribution of firms

Yo-Yi Huang [a], Deng-Shing Huang [b,*]

[a] Institute of Applied Economics, National Taiwan Ocean University, Taiwan
[b] Institute of Economics, Academia Sinica, Taiwan

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ABSTRACT

In a two-country monopolistic competition general equilibrium model, we consider two types of firms: big with higher fixed cost but lower marginal cost, and small with lower fixed cost but with high marginal cost. We prove that free trade may not always benefit the big-country and/or big firms. The smaller country may take more than proportional market share after free trade in the big-firm and/or small-firm market, if the cost advantage dominates the disadvantage in the smaller home market. This result may explain the phenomenon of rising big-enterprises from the small emerging economies in the last decades. In addition, we also prove that an increase in the global market size may lead to more small-size firms, unless the elasticity of substitution is large enough.

1. Introduction

According to the statistics from the top global 2000 firms (Global 2000) published in the Forbes magazine, many interesting phenomenon can be observed, especially the rising number of firms from the emerging economies, and declining from the conventional developed countries. Note that ranking by number of firms in the list of year 2011, the U.S. takes the 1st place by the firm number of 536, followed by Japan of 260, China 121, UK 86, France 67, Canada 67 and Germany 67.[1] However, the dynamic pattern seems to reveal other important phenomenon. More specifically, countries that have experienced a growing number of big firms during the period from 2004 to 2011, include China (increase by 115 firms), South Korea (27), India (31), Hong Kong (16), Switzerland (8), Australia (7), Taiwan (7), Brazil (14) and Russia (15).[2] On the contrary, countries experiencing a declining number of big firms include the U.S. (−186), Japan (−68) and U.K. (−44) just to name a few.

Factors behind the phenomenon may involve many aspects. However, a quick look on the positive correlation between GDP and source countries owning the Global 2000 firms would show the positive role of the source country's market size.[3] Loosely speaking, the fact that a big country tends to have more big firms and thus take relatively higher market share in trade market, seems to provide an empirical evidence for the famous home-market effect (HME), initially raised by Krugman (1979) and followed by Krugman (1980) and Helpman and Krugman (1985). According to conventional home-market effect, a bigger country's firm will take more than proportional share of the world market that characterized by increasing return to scale and monopolistic competition. Therefore,

* Corresponding author at: Institute of Economics, Academia Sinica, 128, Academia Road, Section 2, Nankang, Taipei 11529, Taiwan. Tel.: +886 2 27822791x204.
E-mail address: dhuang@econ.sinica.edu.tw (D.-S. Huang).

[1] The Global 2000 firms collect the top 2000 big firms in the world since 2004. For the details about the ranking and relevant information of the Global 2000 firms, refer to the website http://www.Forbes.com/global2000/list. See also Yang and Huang (2014) for further statistics and analysis.

[2] See Table 16.1 in Yang and Huang (2014).

[3] See Peng et al. (2012) for the empirical evidence.

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a country with bigger country size will more likely have firms taking higher market share in the world, and hence having a greater sales, assets and even employees than firms from other smaller countries. As a result, we would observe more big firms in the Global 2000 listings from the big countries.

In other words, it is a common phenomenon that firms are different not only in their output sector, but also in their size even under the same industry. Although large and/or well-developed countries seem to have advantage in fostering big firms, we also observe some big firms arising from other type of countries, especially those newly small industrialized economies or the latterly opening-up emerging economies.

Further development of the HME literatures mostly confines to justify the HME under different modeling assumption. For example, in a model of monopolistic-competition with many industries, Hanson and Xiang (2004) prove that higher transport costs and more differentiated products tend to have more intensive home-market effect. In addition, using the gravity approach their theoretical findings are also empirically supported.[4] Davis (1998) illustrates that if both the homogeneous and differentiated goods face identical transport costs, then the home-market effect will vanish.[5] Behrens (2005) shows that the existence of non-traded goods may also offset the home-market effect. Head, Mayertt, and Ries (2002) find that the home-market effect may reverse in a Cournot-competition model, in which varieties are linked to nations rather than firms. This result is consistent with those found in Head and Ries (2001) who consider a model featuring perfect competition and national product differentiation. The reversal of home-market effect is also found in a 'reciprocal-dumping' model by Feenstra, Markusen, and Rose (2001) considering nation-specific varieties. Yu (2005) shows that if the consumer's preference follows the form of a constant elasticity of substitution between the homogeneous and differentiated goods, then the reverse home-market effect may occur depending on the level of elasticity. More specifically, if the elasticity of substitution is less than one, then the home-market effect will reverse.

Another stream of studies focus on the role of technological advantage of the small countries for offsetting its unfavorable HME. For example, Ricci (1999) emphasizes the importance of the marginal cost advantage in offsetting or even reversing the home-market effect. In addition, Forslid and Wooton (2003) illustrate that technology advantage in the fixed costs can also make the home-market effect disappear.

Little attention in the related literature has been paid on the role for firm size and the role of market size domestically and/or globally for fostering the big- and/or small firms. There is a stream of literature on the relationship between trade liberalization and firm survival, that, to a certain degree, are lightly related to our study. In this line of research, conventional wisdom believes that firm size, in addition to age, is positively correlated to the likelihood of firm survival. See for example Lin and Huang (2008) and the references therein. However, based on the Chile's firm data, Álvarez and Vergara (2013) empirically show that the small and median size firms are more likely to survive in industries with higher exposure to international trade. The purpose of this paper is to explore the theoretical relationship between globalization and firm size distribution following the line of HME studies. More specifically, we would like to examine whether a big country facilitates the arising of big firms, and whether free trade, that indirectly enlarges the market size for firms, would also favor the survival of big firms in the big country.

The rest of this paper is organized as follows. Section 2 establishes a monopolistic competition world trade model with two countries, and two types of firms, big and small. The equilibrium under autarky and free trade are elaborated. Section 3 analyzes the role of relative country size under free trade. More specifically, we will replicate the result of conventional HME, and more importantly, we will provide some HME-reversal results. In Section 4, we examine the effect of global market expansion, and prove that an increase in the global market size may not always favor the big-firm. Section 5 concludes the paper.

2. A model with heterogeneous firms

Suppose that the economy comprises two countries, Home and Foreign which are denoted by an asterisk (*), and that they are similar with regard to consumers' preferences but not necessarily in their production technologies and size. There is only one factor of production, labor, and thus the relative country size is measured by the labor force. Let L denote the size of the world's total labor force, of which γL $(0<\gamma<1)$ belongs to the Home country and $(1-\gamma)L$ belongs to the Foreign. In addition, we assume that the labor supply is large enough in each country. That is, γ denotes the relative Home country size. As usual, we assume that there are only two sectors: a perfect competition sector which produces homogeneous goods (Y), and a monopolistical competition sector which produces a large number of varieties of a firm-specific differentiated product (X). The homogeneous good, which will be taken as the numeraire, is produced under constant returns to scale technology.

The central assumption is that there is a positive (but not prohibitive) transport cost for the differentiated product under free trade. More specifically, for the differentiated product, the international shipment incurs an "iceberg" effect of transport costs wherein for t $(t>1)$ units of the goods shipped, only one unit arrives. Thus, the domestic price of the imported differentiated product will be tp^*, provided that p^* is the producer's price for the Foreign product. On the other hand, the homogeneous good is assumed to be costless to trade, and both countries produce it after trade; with identical technology in this sector, this assumption implies that the wage rates are equal between the countries.

[4] Pham, Lovely, and Mitra (2014) show that the HME results found by Hanson and Xiang (2004) may not be robust. This is because that the empirical results are sensitive to the way that dependent and independent variables are constructed, and the way of dealing with the unobserved trade flows.

[5] See also Davis and Weinstein (2003), Holmes and Stevens (2005), Crozet and Trionfetti (2008) and the references therein.