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Heterogeneous Firms and Cost Sharing in China's Marketplaces

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Heterogeneous Firms and Cost Sharing in China's Marketplaces *

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1 Introduction

In this research project, we investigates the impact of cost sharing in a marketplace on heterogeneous firms' sales strategy. Sharing costs means that firms in a marketplace do not need to build independent sales channels, can easily collect information on competitors and consumers, and share various services in the marketplace. As a result, less productive firms often prefer to locate in marketplaces, whereas more productive ones tend to locate outside of it.

To analyze the effects of cost sharing on a firms' sales choice, we develop a Melitz-style model in which firms share fixed costs only in the marketplace. To sell its products to consumers, each firm is required to locate in a marketplace or establish its own store outside the marketplace (modern distribution channels). While locating in a marketplace gives firms the advantage of share fixed costs, doing so also disadvantages them through higher transaction costs (North, 1991). A modern distribution channel, on the other hand,

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allows for lower transaction costs but higher fixed costs from independently establishing a sales channel.

Under these settings, we find that introducing cost sharing provides a qualitative change of conditions for firms' sales strategies. Importantly, the size of population or human capital influences the number of varieties, which further affects the size of a marketplace. Through shared fixed costs in the marketplace, firms tend to benefit much more than competitors utilizing modern distribution channels. More precisely, less productive firms can not survive without the marketplace but become profitable and survive if a marketplace is available; this in turn increases the number of firms operating in the marketplace. As a result, even consumers are better off because of the wider varieties produced in the economy. Without sharing fixed costs in a marketplace, firms equally benefit from the increasing size of population or human capital. In this case, there is no reallocation of resources among firms in the marketplace and their competitors utilizing modern distribution channels.

It is noteworthy that lower fixed costs for modern distribution channels due to the deregulation of establishing such channels keeps the ratio of the indifferent productivity to threshold productivity unchanged. However, cost sharing increases threshold productivity during the deregulation process, which in turn increases both the number of firms in the marketplace and the total number of varieties, even though the fixed costs of firms only outside the marketplace decreases. Thus, social welfare is improved during the deregulation process.

An existing paper that introduces cost sharing in a model for heterogeneous firms is Krautheim (2012), which accounts for fixed costs of exporting which decreases with the number of exporters. To determine the number of exporters, Krautheim (2012) assumes that the total number of firms in an industry is fixed; under these conditions, the entry and exit of firms into an industry is not affected, although cost sharing may impact the degree of externalities. However, the assumption of Krautheim (2012) appears to be unrealistic since, in reality, industries frequently experience the entry and exit of firms. The present paper also constructs a model with heterogeneous firms and fixed cost sharing; however, we consider an endogenous number of firms in an industry by introducing sharing fixed costs, which thus qualitatively changes results in Melitz (2003). In doing so, we clarify the gap between the case with and without shared fixed costs in a marketplace.

2 Background

Developing countries consist of several distribution channels, of which traditional marketplaces are the most popular worldwide. Marketplaces have played an important role in China's domestic trade circulation. During 1978–2003, the total number of marketplaces in China increased from 33,302 to 81,017. In a mere decade, from 1990 to 2000, the transaction volume of consumer goods in marketplaces accounted for $26.1 - 62.1\%$ of Chinese total retail sales of social consumer goods.[1] However, from 2006 to 2014, the share of markets with a turnover of above 100 million yuan declined from 37% to 19%.[2] Nevertheless, marketplaces remain key in China's domestic distribution for the following reasons. First, in addition to the above100millionyuan markets, there are more than 50,000 marketplaces whose transaction volume is below 100 million yuan, which have not been accounted for in the data. Second, in recent years, e-commerce platforms have proliferated in China. In 2015, the total online retail sales amounted to 2.79 trillion yuan with a growth rate of 49.7%.[3] From our definition of distribution channels shared by a large number of small-scale firms with higher transaction costs and lower fixed costs, e-commerce platforms are essentially similar to marketplaces.

On the other hand, as an economy develops, firms tend to own their distribution channels, hereinafter "modern distribution channels." An increasing number of firms with high productivity levels in the manufacturing sector have begun establishing their own sales networks. They organize a wider scale of sales agents to sell products; for example, there are 300 apparel companies in the Rui'an wear cluster in Wenzhou, China (Ding

[1] Data are taken from National Statistics Trading, Goods and Materials Statistics Secretary (NST-GMSS), ed. 1991-2001, Zhongguo Shichang Tongji Nianjian [Market Statistical Yearbook of China], Beijing: China Statistics Press.

[2] Data are taken from China Statistical Yearbooks, National Bureau of Statistics of China, for the calculation. We were able to retrieve data for only the so-called "above 100 million yuan markets."

[3] Source: http://www.stats.gov.cn/tjsj/zxfb/201601/t20160119_1306083.html (accessed on March 1, 2016).

2012, Chapter 10). By 2005, these companies opened nearly 10,000 stores in China's domestic market.

Company L is representative of Rui'an's casual wear company. In 2005, its production output reached 6 million pieces, amounting to 80 million yuan in sales. Company L's products are mainly sold to mid-income consumers of domestic small-sized cities and countylevel cities. It established more than 400 chain stores to cover the broad geographical scope of Shanghai (5060 stores), Zhejiang Province (110 stores), Jiangsu Province (just under 100 stores), and three provinces in Northeast China (100 stores). Contrary to a firm in the marketplace, a company with its own sale network must bear higher fixed costs but lower transaction costs as imitation is more difficult.

Most booth keepers in marketplaces tend to be lessproductive SMEs. A good example is the narrow fabric industry in Yiwu China Commodity City (Yiwu market). According to Fah (2008), there are three types of firms in this industry: workshops (with an average of less than 19 machines), factories (20100 machines), and companies (more than 100 machines). The number of machines represents the size of fixed costs. An ISO certificate can be regarded an indicator of each firm's productivity. Fah (2008) showed that of those surveyed, 90% companies held ISO certificates, whereas only 33% factories and no workshops were certified. In other words, a firm whose productivity is low incurs lower fixed costs.

Marketplaces allow firms to have low fixed costs to sell their products, which stimulates the development of small-scale firms in the following manner.

First, marketplaces provide a sales channel shared by small-scale firms. A firm can meet numerous buyers every day and the larger the number of booths in a marketplace, the greater the number of buyers. To access these buyers, a firm must pay a booth rent and taxes as fixed costs and thus, saves various advertising and promotion costs. Consequently, the necessary costs for each firm to search for a new buyer is considerably low. In Yiwu's narrow fabric industry, the average share of sales is 57% for workshops, 56% for factories, and 32% for companies (Fah 2008). In sum, the lower the productivity, the smaller the firm size and higher the sales share in Yiwu Market.

Second, marketplaces help small-scale firms collect information on competitors and consumers. A marketplace with a large number of sellers and buyers offer more opportunities to access information. An example is the Huaqiang North Market in Shenzhen, which comprises 20,000 booths and 600,000 daily visitors (of these, 10,000 are professional buyers). According to a questionnaire survey of 56 local cellphone companies[4], 45 companies consider Huaqiang North Market important or comparatively important to acquire consumer demand information and 42 believe so for competitor information. However, given the easy accessibility to competitors information, the infringement of intellectual property or imitation is more common in a marketplace. According to the above mentioned questionnaire, 31 companies consider the Huaqiang North Market to have intensified imitation activities among firms. As a result, firms pay more money to continuously differentiate their products, which however are horizontally differentiated. The products of a firm with lower fixed costs tend to be imitated more easily and thus, the transaction costs for these lessproductive firms are higher. By contrast, firms with high productivity generally construct their own sales networks and formulate their own brand strategies. In this case, although the fixed costs are higher, the transaction costs become much cheaper and the total profit margins are greater.

Finally, marketplaces provide various services to small-scale firms: the larger the number of firms in a marketplace, the greater the economies of scale at the level of a marketplace in providing services. For example, the Yiwu market established an international logistics center that includes various facilities such as container yards, warehouses, delivery centers, unloading zones, shipment zones and parking areas.[5] These logistic facilities are shared by the large numbers of smallscale firms in Yiwu.

3 Results

We obtained following results:

- *Because of the shared fixed costs in the marketplace, the threshold productivity level*

[4]Data are collected by Ke Ding and Shiro Hioki, the members of the research project the upgrading of Chinas industrial agglomeration: an interdisciplinary approach of spatial economics and area-study funded by a grant from the Japan Society for the Promotion of Science (JSPS).

[5]Source: http://baike.baidu.com (accessed on February 18, 2016).

for firms to survive in the economy decreases and the number of firms in the marketplace increases. Furthermore, the impact of greater varieties dominates the impact of a lower threshold productivity. Thus, individuals are better off sharing fixed costs in the marketplace.

- *As for increasing human capital with the same magnitude, social welfare increases far more when there exists cost sharing than without.*

- *If the government relaxes the regulation on the establishment of modern distribution channels (i.e., the fixed costs of firms outside the marketplace decreases), less productive firms can survive in the economy and the number of available varieties increases. However, the numbers of active firms in the marketplace and in modern distribution channels increase, while the ratio of indifferent productivity to threshold productivity remains unchanged. Finally, the effect of expanding varieties dominates that of decreasing survival productivity, which results in the improvement of social welfare during deregulation process.* We clarified that the decreasing fixed costs of modern distribution channels leads to a larger marketplace with cost sharing. This is because lower fixed costs in modern distribution channels positively affect firms' entry decisions. Thus, a large number of entry firms triggers scale economy in the marketplace, which results in an increase in the size of the marketplace.

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