

Roles of Wholesalers in Transaction Networks

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New light is being shed on the role of wholesalers in transaction networks. Wholesalers have a long history, and there is a certain concept of what their role is, but there has been little empirical research conducted using data. RIETI Senior Fellow Yukiko Saito, whose research field covers spatial economies, has conducted research on this issue using network analysis methods. Results have shown that wholesalers play an important role in reducing transaction costs and geographically expanding trading networks. It is expected that network data analyses, which have seen a breakthrough due to wholesaler research, will be leveraged for actual policy planning, such as regional policy.



Profile

Yukiko Saito is a senior fellow at RIETI. After receiving her Ph.D. in physics from the University of Tokyo, she became a researcher (a senior associate, afterward) at the Fujitsu Research Institute from 2002 to 2012. She joined RIETI in 2012. Her recent works include: "Geographical Spread of Interfirm Transaction Networks and the Great East Japan Earthquake," in *The Economics of Interfirm Networks*, Springer Publishing, 2015; "Production Networks, Geography and Firm Performance," (with A. B. Bernard and A. Moxnes), NBER Working Paper No. 21082, April 2015; "Labor Income Inequality in Japanese Corporations and Employee Health: Evidence from Japanese Health Insurance Society Data," (with T. Kouno), *Problems and Perspectives in Management*, Vol. 10, Issue 4, December 2012, pp. 49-56; "Strong Customer/Supplier Relationships: A key to enterprise growth in Japan," (with I. Uesugi) in *High Growth Enterprises: What governments can do to make a difference*, OECD Studies on SMEs and Entrepreneurship, OECD Publishing, 2010.

— When you wrote your paper, what was the perspective from which you approached the role of wholesalers?

When a firm is engaging in economic activities, the relationship with suppliers and customers in the supply chain plays a vital role in determining its performance. Our research has so far covered the structure of inter-firm transaction networks, geographical expansion of the network, shock propagation of the Great East Japan Earthquake through the network, and their relationship to firm performance. We focused on the wholesalers because we assume that they played a vital role in constructing

efficient networks that link firms.

Due to transaction costs partly caused by geographical factors, there appeared to be some significance to the fact that wholesalers do business with firms with long transaction distances, and that they play a vital role when engaging in business with various firms. That's why we have tried to conduct research on the subject.

Keio University Associate Professors Yukako Ono, a co-author of the paper and an expert on industrial organizations, and

Toshihiro Okubo, another co-author and an expert on international trade, both had the same awareness of the issues so we decided to work together.

— What do you know about transaction networks from previous research, and what progress have you made regarding research on wholesalers?

There has been progress in research on wholesalers in the field of international trade. From firm-level analysis, it is found that firms engaging in direct exporting have extremely high productivity. In addition, firms that export indirectly via a wholesaler have the second highest productivity and firms with low productivity only deal with local companies. Such differences in trading networks between firms with different productivity have been examined in previous literature.

Using a wholesaler enables many firms to participate in trade. And, since wholesalers intermediate in a multitude of transactions, they are able to accumulate various types of information. This is the reason to use wholesalers when a firm is trying to enter a market with high costs. Therefore, there was a discussion on the role of wholesalers from the perspective of international trade. The next question was what happens when we go domestic? There has been no research on roles that wholesalers play in domestic trading networks, and we didn't know which firms were connected by wholesalers.

— What method did you use to analyze the role of wholesalers? Could you tell us about the data that you used for your research and the method by which you analyzed it?

We used firm-level transaction data from Tokyo Shoko Research Ltd. (TSR). Japan has a unique dataset of transaction network with about four million transactions for about 800,000 firms that tell us not only which firms are trading with whom, but also which firms are trading indirectly with whom. There are many types of wholesalers, including those that are direct partners of retailers, but in our research, we only focused on those that link manufacturing (MFG) firms to other MFG ones.

In order to compare MFG firms that engage in direct transactions with those that engage in indirect transactions, we have constructed a database, which redesigned TSR transaction data, by capturing an average value from information on the firms with which MFG sellers were trying to connect via wholesalers for these indirect transactions. Similarly, we also considered the average attributes of firms in terms of what firms MFG buyers were trying to purchase from via wholesalers (Table 1). We then used regression analyses to examine the characteristics of MFG firms which are using wholesalers, for example, whether large firms use wholesalers, and whether firms in agglomerations use wholesalers. In addition, comparing distance between wholesalers and MFG firms with distance between MFG firms, how the distance changes by using the wholesalers is analyzed. In other words, we analyzed two things: who is using wholesalers, and what is the distance relationship.

Table 1: Data for Direct Transactions and Indirect Transactions

When selling (Sample 1)

	MFG firms		Direct transaction partner		Indirect transaction partner
Direct transaction	MFG sellers	→	MFG buyers		
Indirect transaction	MFG sellers	→	Wholesalers	→	MFG buyers (Average)

When selling (Sample 2)

	MFG firms		Direct transaction partner		Indirect transaction partner
Direct transaction	MFG buyers	←	MFG sellers		
Indirect transaction	MFG buyers	←	Wholesalers	←	MFG sellers (Average)

— What have you learned from your research?

The first thing we have learned is that there is an opposite relationship between purchasing and selling when it comes to who is using wholesalers (Table 2). The larger the firm, the more of a tendency there is to use a wholesaler when selling. The previous discussion in international trade literature tells us that small companies are likely to use wholesalers, but our findings indicate that when they sell, large companies use wholesalers. In contrast, we have also learned that small companies use wholesalers when they purchase. So, we now see that there is a big difference between purchasing and selling.

Table 2: Wholesaler Use (transaction-link level regression analysis)

	Probability of wholesaler use	
	When selling (Sample 1)	When selling (Sample 2)
Firm size (sellers)	+	+
Sellers' density of area	+	+
Firm size (buyers)	-	-
Buyers' density of area	-	-

All variables are significant at a critical p-value of 1%

Also when looking at whether the region is an agglomeration area or not (density of area in the table), we found that when MFG sellers located in agglomerations use wholesalers, but when MFG buyers are located in non-agglomerations, they use wholesalers. We saw the following concept: large MFG firms in agglomerations will deliver goods to small MFG firms in the non-agglomerations via a wholesaler.

To put it specifically, for the most part, compared with large MFG firms that engage in the mass production of general products, smaller MFG firms tend to produce more specific products that only they have the ability to produce. In this case, large firms will purchase these specific products from each small firm without going through a wholesaler. On the other hand, when large firms sell they use a wholesaler to improve distribution. Small firms use wholesalers to purchase products in non-agglomerations.

The second thing we have learned is from a distance analysis. Compared with MFG firms that do business directly, our findings showed that wholesalers were located close to MFG buyers and far from MFG sellers. We can interpret these results as follows: when a small firm makes a purchase, trust with the customer, such as whether or not they can actually pay the bill, is necessary. So, for a wholesaler, being close to small regional firms that are purchasing is beneficial because they can ascertain the firm's solvency. These wholesalers then purchase goods from the large cities and distribute them in the regions. This is how wholesalers function.

— With depopulation in rural areas and urban concentration, the movement to make distribution more rational and efficient has accelerated. What do you think the future roles of wholesalers will be?

With the bipolarization of rural and urban areas, there are costs such as those for search and monitoring caused by geographical factors. In this regard, wholesalers can help overcome geographic costs. By using a wholesaler when trading overseas, costs that depend on geographical factors can be reduced. Similarly, although small rural firms cannot directly access firms in large cities, a wholesaler can serve as an intermediate between them. I think wholesalers will serve as important hubs for rural areas because they can help overcome these geographical factors.

Distribution will become more efficient through online direct trading, but I think wholesalers will still play a necessary role. Rural wholesalers are expected to play an important role, since the ability of small rural firms to pay can be monitored, and also they can be provided a credit by using a wholesaler. For small rural firms that are not very solvent, wholesalers play an important role in terms of regional finance. While regional financial institutions serve to match trading firms, wholesalers have a profound knowledge of the commercial market because many of them were originally manufacturers. Since such kind of people is acting as wholesalers, they can match business partners better. For rural areas, I think wholesalers play a different role than rural financial institutions.

— Based on your research, could you give us policy recommendations with regard to regional economic policy?

Wholesalers play an important role as local infrastructure that can match firms that are distant from each other. I think it's important to introduce policies in light of this relationship.

I cannot suggest a detailed policy, but regions can be viewed as networks. And, in addition to the role that wholesalers play in the region, they also serve as a network for linking the region to parties outside the region. If this is understood, then which firms are important can be seen. For example, there may be a firm that is not performing well, but given the propagation, it may be seen that the firm is actually an important core element to the region if it were to become removed. When the conditions in the region are examined, it is important to examine the region as a network, in addition to investigating each factor. More importantly,

policies should be introduced after ascertaining what the assets of the region are.

Within the regional policies of the Small and Medium Enterprise Agency of the Ministry of Economy, Trade and Industry, there is a movement to construct a system for ascertaining transaction networks that can be viewed publicly by employees of local governments. There is a gradual movement to encourage local governments to create various policies in preparation for some sort of a great impact to the region, such as an earthquake disaster, by using this network to investigate what risks will occur and where. This movement proposes using network data not just for research and analyses, but in the field and on the job in order to make policy planning.

The role of the firm can be re-realized by looking at the data. Vague concepts can now be analyzed statistically. I think we should use empirical analyses to conduct more and more research that can produce detailed implications.

— Are there any research issues that you weren't able to touch on in this paper, and do you have any future research plans?

I would like to investigate the role of wholesalers by using data that are a little more multifaceted. I predict that wholesalers function to provide trust, so I would like to analyze this issue further by combining with credit sales and credit purchasing data.

There are wholesalers that link companies in large cities, and those that link large firms. Wholesalers play the role of overcoming geographical factors, but there also are wholesalers that serve to support transactions with a variety of partners and transactions with many partners. I think there are various roles that wholesalers play, such as serving with roles unrelated to distance, and I would like to conduct more multifaceted research.

I would also like to look at regions more as networks without limiting the scope to just wholesalers. I think there are various hubs in addition to wholesalers. In addition to transaction hubs, there may be regional network hubs in the sense that they create knowledge, which is partially served by universities. Various types of networks create advantages for each region. I would like to analyze these types of trading networks and knowledge spillover networks.

We also have to consider the effect of agglomeration when examining regional networks. The effects of agglomeration include reduced transaction costs, the promotion of the knowledge spillover, and the sharing of workers. And, looking deeper into how these effects work within the region and how they are linked to improved productivity will help identify implications that can revitalize regions. I would like to shed more light on this agglomeration effect mechanism. I think it would be interesting to treat regions as networks, and consider networks outside the region upon understanding this agglomeration effect mechanism in order to identify policy implications.