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Distribution Keiretsu, FDI and Import Penetration in Japan

David Flath*

Abstract

Directed marketing channels—in Japan known as distribution keiretsu—are more likely than others to be headed by a primary wholesaler that is vertically integrated with the manufacturer, which for foreign manufacturers entails their directly investing in Japan-based wholesale subsidiaries. We support this statement with empirical evidence and theoretical reasoning. Briefly stated, vertical integration better aligns the noncontractible wholesaler effort levels with the manufacturer's profit, but necessarily foregoes the inherent advantage of an independent wholesaler at market widening efforts. This establishes a tradeoff bearing on the decision to vertically integrate. Where market widening efforts complicate the resolution of retail externalities, it can be better to forego market widening efforts altogether and instead focus exclusively on resolving the externalities, vertically integrating with the wholesaler in order to better administer a distribution keiretsu.

JEL classifications: F14 Industry studies of international trade, F23 Multinational firms and international business, L22 Firm organization and vertical integration, L81 Industry structure of wholesale trade. *Key words:* Foreign direct investment, distribution keiretsu, vertical integration, wholesaling industry

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David Flath
Department of Economics
North Carolina State University
Raleigh, NC 27695-8110

Tel. 919-515-4617
Email. david_flath@ncsu.edu

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1. Introduction

Although it is widely conjectured that Japanese marketing channels with vertical restraints (so-called distribution keiretsu) are more difficult for foreigners than for domestic firms to penetrate, there have as yet been no empirical studies of this hypothesis. Data both on the incidence of distribution keiretsu in 1986 and extent of foreign purchases by wholesalers in 1997 are available from the surveys of wholesalers conducted by the Japanese government (MITI), for 80 different 4 digit s.i.c. lines of wholesale business. In the following I will attempt to analyze these data in a revealing way. At the outset we need to reflect for a moment on why distribution keiretsu and import penetration are plausibly linked. Not because distribution keiretsu are exclusionary or closed distribution channels –they are not. Distribution keiretsu and import penetration are linked because effective administration of a distribution keiretsu is likely to require that the primary wholesaler is vertically integrated with the manufacturer, which for foreign suppliers entails their directly investing in Japanese wholesaling. Impediments to inward FDI in Japan thus have a disproportionately adverse affect on import penetration where effective marketing entails wholesaler administration of a distribution keiretsu.

Distribution keiretsu is the name for a marketing channel in Japan with vertical restraints. This is not really a Japanese peculiarity per se. What are called “directed marketing channels” in the academic marketing literature of the US amount to virtually the same thing as distribution keiretsu. These are marketing channels in which the manufacturer, or sometimes a primary wholesaler, attach preconditions or contractual stipulations to the activities of downstream distributors of the product. The stipulations vary but fall under the broad heading “vertical restraints”. They include stipulations regarding prices (minimum price, maximum price, set price), stipulations of exclusivity, and customer assignments. Antitrust law is preoccupied with the possibility that vertical restraints might be part of a cartel scheme, and in a few instances

they have been shown to be that. But economic analysis suggests that in many more instances vertical restraints are there to address externalities in marketing. Where several retailers (wholesalers) with overlapping territories supply the same product, promotional efforts by any one increases demand for the others. In the absence of special measures coordinating their efforts they each underinvest in promotional efforts, both from the point of view of the group and from the standpoint of economic efficiency. The vertical restraints achieve such coordination and lower marketing costs. This is a common feature of many economic models of vertical restraints. See for example Telser (1960), Mathewson and Winter (1984), or Rey and Tirole (1986). Also see Flath (1989) for applications of such models to Japanese cases.

Where administering a system of vertical restraints is an important aspect of marketing, the manufacturer and primary wholesaler are more likely to be vertically integrated. This is because the very externalities that give rise to vertical restraints also lower the cost of vertical integration. The many aspects of wholesale marketing that cannot be identified *ex ante* or verified *ex post* are necessarily left to the discretion of an independent wholesaler. The economic incentive to perform these noncontractible tasks then resides in the market-determined sharing of economic rent between the manufacturer and wholesaler. In general this incentive remains imperfect. Vertical integration enables the manufacturer to direct the noncontractible wholesale efforts itself with consequent improvement in outcome. But in vertically integrating, the manufacturer necessarily foregoes the comparative advantage of an independent wholesaler at expanding market coverage. An independent wholesaler that stocks many products and has many customers is better able to expand market coverage than if it were the captive subsidiary of just one manufacturer. However, efforts to widen market coverage have a lower payoff if externalities are present. This is because widening market coverage increases the externalities and further complicates their resolution by raising the costs of administering a system of vertical restraints. Thus where externalities are present, vertical integration between manufacturer and primary

wholesaler is less costly and more likely.¹ Vertical integration of wholesaling with manufacturing and administration of a directed marketing channel are complements in the sense of Milgrom and Roberts (1995).

This study extends and complements several previous ones that have empirically analyzed integration of manufacturing and wholesaling in international sales. Anderson and Coughlan (1987) analyze the choice between independent and integrated foreign distribution channels in 94 overseas operations of 36 U.S. based semiconductor firms. They find that integration is associated with survey responses indicative of asset specificity and product differentiation. Klein, Frazier and Roth (1990) analyze the foreign marketing channel integration decisions of 510 Canadian manufacturing firms in a wide set of different industries. They too found that survey responses indicative of asset specificity were associated with integration. Sakakibara and Serwin (2000) find that Japanese multinational manufacturing firms affiliated with any of the six financial keiretsu were less likely than others to have made direct wholesale investments in the US. They argue that these firms more than others have close and long-term relationships with general trading companies and this obviates their need to sell through US-based independent wholesalers if not themselves integrating into wholesaling—the Japan-based general trading companies act as their wholesalers. All of these studies identify the tradeoff in integration of manufacturing and wholesaling as between the superior control of salesmen that accompanies integration versus the economies of scale and scope that can be achieved in dealing through an independent wholesaler. Roughly speaking, this is the perspective adopted here also, but with a twist. Namely, the wholesale activities that benefit the most from close control of employees—activities pertaining to the administration of a directed marketing channel—actually compete with the ones that benefit from expanded scale and scope —efforts to widen market coverage. In an extreme case, the choice between integration and independence might actually entail a choice of

¹This same logic applies to vertical integration of separate wholesalers. And as demonstrated by Nariu and Flath (1993) marketing channels in Japan with a higher incidence of distribution keiretsu tend to have fewer wholesale steps.

which of the two sorts of competing activities to perform at all. This same kind of tradeoff has been highlighted by Baker and Hubbard (2003) as important in explaining the decision of shippers to use their own fleet of trucks or contract with independent truckers. Independent truckers can not easily be made to supply ancillary services such as careful off-loading of shipments, but are well positioned to find matching back-hauls. Companies that use their own private truck fleets to deliver their goods face the opposite conditions. Independence thus makes more sense where special non-contractible driver services have less value and foregoing them altogether might be the lesser of two evils. In the language of Holmstrom (1999) we might best consider “the firm as a subeconomy which regulates trade according to second-best principles” (p.89).

To make these ideas precise we first develop a stylized example. We then demonstrate the ideas’ empirical validity in addressing the issues raised in the opening paragraph, by showing that foreign direct investment in Japanese wholesaling is indeed heavily concentrated in marketing channels with relatively high incidence of distribution keiretsu. These same marketing channels tend to have a slightly lower rate of import penetration, which is indirect evidence that some impediments to inward foreign direct investment still existed in Japan in 1997, our year of observation.

2. Economic Aspects of Foreign Direct Investment in Wholesaling

In this section we present a simple example that precisely represents the economic forces that bear on a manufacturer’s choice to vertically integrate (i.e. directly invest) in wholesaling. We begin with the calculations of a vertically integrated firm with regard to its wholesale activities.

2.1 *Vertically integrated wholesaler*

Let s be the extent of the captive wholesalers’ activities directed at resolving externalities among downstream distributors, and let e be the extent of the wholesaler’s efforts to widen the

market coverage. We suppose that both activities add value but that more of either raises the marginal cost of the other. Let the cost of these activities be $C = \frac{1}{2}(s+e)^2$. Denote by V the net value of these activities and specify:

$$(1) \quad V = ms + ge - se - \frac{1}{2}s^2 - \frac{1}{2}e^2,$$

where $m > 0$ and $g > 0$ are parameters representing the marginal products of wholesale activities. For products that require special promotion or service to be marketed effectively, special measures to align the interests of downstream firms are valuable and m is high. For products such as convenience goods that require wide market coverage to be marketed effectively g is high. The third term reflects our presumption that measures to widen coverage have a higher marginal cost the more extensive are activities aimed at resolving externalities, and vice versa.

The vertically integrated firm chooses positive values of s and e to maximize V . There is no interior solution, only a corner solution. The solution values depend upon the parameters as follows:

$$(2) \quad \begin{aligned} &\text{If } m \leq g, \text{ then } s^* = 0 \text{ and } e^* = g. \\ &\text{If } g \leq m, \text{ then } e^* = 0 \text{ and } s^* = m. \end{aligned}$$

This implies that if $m > g$ the value of wholesale activity is $V = \frac{1}{2} m^2$, and if $g > m$ the value is $V = \frac{1}{2} g^2$. The vertically integrated wholesaler only engages in the activity with the greater marginal product. If $m = g$ then there are two solutions, both of which are corner solutions.

2.2 Independent wholesaler

Now consider the calculation of an independent primary wholesaler. We introduce some additional presumptions in line with our earlier discussion. First, we presume that an independent wholesaler's efforts at widening market coverage have a greater marginal product

than if the wholesaler were the captive subsidiary of a single manufacturer. Second we presume that the wholesaler's efforts are not contractible. Finally, bargaining between the manufacturer and independent wholesaler divides the economic rent equally, but only after all the costs have been sunk. Let the costs be the same as assumed for a vertically integrated wholesaler. The net value becomes

$$(3) \quad V = ms + \lambda ge - se - \frac{1}{2}s^2 - \frac{1}{2}e^2,$$

where $\lambda > 1$ reflects the presumed comparative advantage of an independent wholesaler at efforts devoted to widen market coverage. The value maximizing effort levels are

$$(4) \quad \text{If } m \leq \lambda g, \text{ then } s^{**} = 0 \text{ and } e^{**} = \lambda g.$$

$$\text{If } \lambda g \leq m, \text{ then } e^{**} = 0 \text{ and } s^{**} = m.$$

But the independent wholesaler chooses effort levels s and e to maximize only its own share in the value that results from bargaining. To keep matters simple we presume that neither the wholesaler nor the manufacturer have outside opportunities. The wholesaler's objective function in choosing the noncontractible levels for s and e becomes:

$$(5) \quad W = \frac{1}{2}(ms + \lambda ge) - se - \frac{1}{2}s^2 - \frac{1}{2}e^2.$$

Again there is a corner solution and its value depends on the parameters as follows:

- (6) If $m \leq \lambda g$, then $s^*=0$ and $e^* = \frac{1}{2} \lambda g$.
 If $\lambda g \leq m$, then $e^*=0$ and $s^* = \frac{1}{2} m$.

This implies that if $m > \lambda g$ the value of wholesale activities is $\frac{3}{8} m^2$, and if $\lambda g > m$ the value is $\frac{3}{8} \lambda^2 g^2$. The independent wholesaler only engages in the activity with the greater marginal product. If $m = \lambda g$, then there are two corner solutions. Notice that the effort levels chosen by the independent wholesaler are less than the value-maximizing effort levels, in fact half as great. This is a manifestation of the hold-up problem that arises, as here, when effort is noncontractible.

The emphasis on asset specificity in the earlier empirical studies of FDI in wholesaling of Anderson and Coughlan (1987) and Klein, Frazier and Roth (1990) is premised on association between asset specificity and non-contractibility of efforts. For instance, if wholesale efforts include special training of employees, then any promised reimbursement for the costs of such training are subject to ex-post renegotiation and thus not credible ex-ante. The choice of effort levels by an independent wholesaler are thus sub-optimal as in the present example. Vertical integration resolves this sort of hold-up problem and so is associated with the special in-house training of employees. In this line of thinking, vertical integration achieves first-best effort levels but may have, presumably does have, some special disadvantages of its own that are avoided under independence. In the example here the disadvantage of vertical integration resides in the superior ability of an independent wholesaler over a captive subsidiary wholesaler at some of the very efforts subject to hold-up. Comparison of the two regimes, vertical integration and independence, thus amounts to a comparison of second-bests.

2.3 Comparing the two regimes

Introduce a variable δ to indicate vertical integration or not. $\delta=1$ indicates that the primary wholesaler and manufacturer are vertically integrated. $\delta=0$ indicates that the primary wholesaler is independent of the manufacturer. Thus

$$(7) \quad V = \delta (ms + ge - se - \frac{1}{2}s^2 - \frac{1}{2}e^2) + (1-\delta) (ms + \lambda ge - se - \frac{1}{2}s^2 - \frac{1}{2}e^2)$$

The equilibrium status of vertical integration δ^* , net value of wholesale activities V^* , extent of wholesaler effort at resolving externalities among retailers s^* , and wholesaler efforts at market widening e^* all depend upon the parameters m , λ , and g , as shown in Table 1. To simplify the table we ignore the boundary cases having two solutions.

The comparison of regimes as reflected in Table 1 is actually straightforward. Under either regime only the activity with the greater marginal product is pursued. But we also presume that efforts to expand market coverage have a greater marginal product if the wholesaler is independent. In switching between regimes there might also be a switch in activities with only efforts to counteract externalities under vertical integration and only efforts to widen coverage under independence (true if $\lambda g > m > g$). This would be decisive in favoring independence if and only if the greater comparative advantage of an independent wholesaler dominated the effect of noncontractibility (which would require that $\lambda^2 > 4/3$). In the other cases, switching regimes would not switch activities but would only change their extent. Under vertical integration there would be more intense efforts to counteract externalities (if $m > \lambda g > g$) and this would be decisive in favoring vertical integration. Under independence there would be more intense efforts to widen market coverage (if $\lambda g > m$), but this would only be decisive in favoring independence if the greater comparative advantage of an independent wholesaler dominated the effect of noncontractibility (which again would require that $\lambda^2 > 4/3$).

The above can be summarized succinctly in the following.

Result: On the domain $\lambda^2 > 4/3$, V is supermodular in $(\delta, m, -g, -\lambda)$. On the domain $\lambda^2 < 4/3$, $\delta^*=1$.

Proof. The second part of the result is evident from Table 1. Regarding the first part, supermodularity means that the marginal return from increasing a variable (weakly) increases with each other variable. So for example denote by $\Delta V/\Delta m$ the marginal return from increasing m . It depends on the other parameters as follows on the domain $\lambda^2 > 4/3$:

If $m > \lambda g > g$, then $V = \delta \frac{1}{8} m^2 + \frac{3}{8} m^2$, and $\Delta V/\Delta m = (\frac{1}{4} \delta + \frac{3}{4})m$.

If $\lambda g > m > g$, then $V = \delta \frac{1}{2} m^2 + (1-\delta) \frac{3}{8} \lambda^2 g^2$, and $\Delta V/\Delta m = \delta m$.

If $\lambda g > g > m$, then $V = \delta \frac{1}{2} g^2 + (1-\delta) \frac{3}{8} \lambda^2 g^2$, and $\Delta V/\Delta m = 0$.

--So as g falls ($-g$ increases), $\Delta V/\Delta m$ either does not change or else increases from $\Delta V/\Delta m = 0$ to $\Delta V/\Delta m = m$, or from $\Delta V/\Delta m = 0$ to $\Delta V/\Delta m = \frac{3}{4} m$.

--And as λ falls ($-\lambda$ increases), $\Delta V/\Delta m$ either does not change or else increases from $\Delta V/\Delta m = 0$ to $\Delta V/\Delta m = m$, or from $\Delta V/\Delta m = 0$ to $\Delta V/\Delta m = \frac{3}{4} m$.

--And as δ increases, $\Delta V/\Delta m$ either does not change or else increases from $\Delta V/\Delta m = 0$ to $\Delta V/\Delta m = m$, or from $\Delta V/\Delta m = \frac{3}{4} m$ to $\Delta V/\Delta m = m$. The rest of the proof proceeds in the same vein. \square

From the stated result it follows that on the domain $\lambda^2 > 4/3$, the vertical integration marker δ^* is monotone non-decreasing in $(m, -g, -\lambda)$. The logic here is due to a theorem (6.1) by Topkis (1978) regarding some implications of supermodularity. That δ^* is monotone non-decreasing in $(m, -g, -\lambda)$ can also be confirmed by inspection of Table 1.

We shall presume that our empirical data correspond to the case $\lambda^2 > 4/3$; that is, in which V is supermodular in $(\delta, m, -g, -\lambda)$. To put it another way, we only seek to analyze the variation in δ that can be related to m and g , which we can observe, and ignore any variation that might be due to λ , which we cannot observe, but which we presume is uncorrelated with m and g . We in effect presume that our data has not any instances corresponding to the second to last row of Table 1. Then there is a positive association between δ^* , s^* , m , and $-g$, which is a manifestation of supermodularity.

2.4 Empirical Specification

In the following, guided by the algebraic example just explored, we specify and estimate a statistical model explaining the variation across wholesale industries in the incidence of foreign affiliate wholesalers. Our dependent variable FDI is the fraction of wholesale workers that are employees of Japan-based wholesale subsidiaries of foreign manufacturers. The basic logic of our approach is that, all else the same, FDI should be greater, where industry characteristics favor vertical integration between wholesalers and manufacturers. And based on the algebraic example, factors associated with greater marginal product of efforts at resolving retail externalities, relative to marginal product of market widening efforts, should favor vertical integration between manufacturers and wholesalers. In other words, factors associated with greater values of m/g should favor $\delta^*=1$. These factors include the wholesale profit margin (MARGIN) and the number of wholesale steps (STEPS). Also, whether the good is a consumer product or an industrial one (CONSUMER), and if the former, the number of retail outlets (#STORES). Take a moment to understand why.

The analysis of Nariu (1989) is helpful here. Nariu explains how demanders' information gathering behavior shapes the structure of marketing channels. On one extreme are "experience" goods that demanders purchase sequentially before finally settling on a permanent source of supply. At the other extreme are the "search" goods that demanders inform themselves about prior to purchase. The choice between these two ways of gathering information is itself an economic one. Nondurable, standardized, small-ticket items tend to elicit "experience", while durable, expensive items, with varying complex features elicit the "search" strategy. Effective marketing of experience goods requires maximum market coverage as demanders are likely to sample from the outlets closest to them. Effective marketing of search goods requires promotion, advertising, and attention to the idiosyncratic variation in local demand all along the distribution channel. For experience goods, the market widening activities of wholesalers have a great marginal product. For search goods, efforts at resolving externalities along the distribution channel have a high marginal product. The experience goods tend to be standardized items with

low wholesale profit margins, many final outlets, and multiple wholesale steps. Industrial marketing channels generally do not have retail outlets and to that extent entail fewer externalities than do marketing channels for consumer products.

Additionally, to the extent that distribution keiretsu represent efforts at resolving retail externalities, all else the same, we expect an association between incidence of distribution keiretsu (KEIRETSU) and vertical integration of wholesaler and manufacturer. In terms of the algebraic example, if s^* is great, then $\delta^*=1$. For these industries, foreign direct investment in wholesaling is more likely.

Our basic specification is of the form:

$$(8) \quad \begin{matrix} + & + & + \\ \text{FDI} = f(& s^*, & m/g, \text{IMPORTS}) + \text{error}, \end{matrix}$$

where the signs over the variables indicate signs of partial derivatives if non-zero, and:

FDI = the fraction of wholesale industry employment absorbed by the subsidiaries of foreign manufacturers,

IMPORTS = the foreign purchases (including intracompany shipments) of wholesalers as a fraction of their final sales,

s^* = effort at resolving retail externalities

...fraction of wholesalers subject to distribution keiretsu initiated by manufacturers (KEIRETSU),

m/g = factors that make efforts at resolving retail externalities more productive and efforts at expanding market coverage less productive

...indicators that a product is a search good, and not an experience good or convenience good:

- consumer product rather than an industrial product (CONSUMER)
- wholesale profit margin (MARGIN) is great
- fraction of wholesale sales that are to other wholesalers (STEPS) is small, i.e. wholesale channel has few steps.
- for consumer goods, density of retail outlets (#STORES) is small.

This specification (8) is frankly overdetermined, an acknowledgement that our observed data are imperfect proxies for the variables that constitute the true economic model. We also acknowledge the possible endogeneity of import flows. That is, FDI in wholesaling both follows imports and contributes to them. But this only entails endogeneity bias if foreign manufacturers have greater costs of vertically integrating with wholesalers than would a domestic manufacturer. Suppose, to the contrary, they have the same cost. Then the incidence of FDI would increase imports compared to what they would be in the absence of FDI, but only to bring the flow of imports to exactly the level predicted by exogenous factors alone. There would be no endogeneity bias in estimating equation (8) in this case.

3. Empirical Analysis

3.1 Data and descriptive statistics

3.1.a. Foreign Direct Investment

Our data on the Japan-based wholesale subsidiaries of foreign firms in 1997, are drawn from Touyou Keizai, Gaishi keikigyō souran (Survey of foreign affiliated companies in Japan), annual (since 1986). This source lists basic data on virtually all the large, foreign-owned enterprises operating in Japan. This listing includes all respondents with book value of equity exceeding 50

million yen and with greater than 49 percent foreign ownership.² About one third of these 1,372 large foreign subsidiaries operating in Japan in 1997 were primarily engaged in wholesaling, 468 firms in all.³ Clearly, wholesale affiliates of foreign firms comprise a significant portion of the stock of foreign direct investment in Japan. Fukao and Ito (2003) make this same observation. In fact, wholesaling is a sizeable focus of foreign direct investment generally, not only in Japan. A recent study by Hanson, Mataloni and Slaughter (2001) draws attention to the fact that 20% of the total worldwide sales of foreign affiliates of US multinationals were the sales of their foreign wholesale affiliates (at p. 25).

Touyou Keizai classifies the foreign affiliates by industry, including eleven subcategories within wholesale trade, and also lists the important products of each individual company. From this information I have further classified the individual companies according to wholesale product lines corresponding to the 4 digit s.i.c. of the Census of Commerce of Japan, our source for other data. I then aggregated the individual company *employment* within these 4 digit codes to produce EMP97. The variable FDI scales these employment figures as percentages of the total employment in each wholesale line of business TOTEMP97 reported in the 1997 Census of Commerce of Japan, Report by Distribution Channel (Wholesaling), Table 2.

It was apparent from mere inspection of the data that the foreign affiliates in Japan's wholesale industries are heavily concentrated in a few lines of business including machinery, medical instruments, precision instruments, automobiles, automobile parts, electric appliances and toiletries. All of these are products for which marketing has often entailed vertical restraints

²It also includes those with greater than 20 percent foreign ownership if very large or important but only 10 of the 468 firms classified as wholesalers had less than 49 percent foreign ownership. The modal firm among the 468 had 100 percent foreign ownership.

³Besides the large firms, Touyou Keizai, *Gaishi keikigyō soran* also includes a separate listing (and selected data) for all foreign affiliates of whatever capitalization with more than 20 percent foreign ownership. We do not include these smaller, less tightly controlled enterprises in our investigation.

of one sort or another: manufacturer or wholesaler imposed customer assignments, price restrictions, and the like.

3.1.b. Import Penetration

Data on Japanese imports by wholesalers and on the scale of wholesale marketing channels is taken from the same source as the total employment figures (same table even): 1997 Census of Commerce of Japan, Report by Distribution Channel (Wholesaling), Table 2. We collect the *purchases from foreign sources by wholesalers operating in Japan* (FORPUR97), the *annual sales by wholesalers*, and their *sales to other wholesalers*. Foreign purchases divided by the difference between total sales and sales to other wholesalers –(IMPORTS)– is an approximate measure of foreign penetration of each wholesale distribution channel. This is not quite the same as import penetration per se. Some imports are sales from foreign suppliers directly to final demanders in Japan; they don't go through wholesale channels and thus they escape the purview of the Census of Commerce. But it turns out that most imports into Japan do go through wholesale establishments. For the 1997 Census of Commerce period of observation (July 1, 1996 to June 30, 1997) value of imports into Japan reported by the Japan Tariff Association⁴ totaled 40 trillion yen compared to the 35 trillion yen total foreign purchases by Japanese wholesalers. In other words, almost 90 percent of Japanese imports do arise as foreign purchases by wholesale establishments (including intracompany foreign shipments).

The wholesale establishments that are the objects of query in the Census of Commerce are classified by the 4 digit s.i.c. wholesale businesses in which they are principally engaged, with ones widely engaged in multiple lines of business classified as general trading companies. The general trading companies' 19 trillion yen in foreign purchases comprised a little more than half of the total foreign purchases by all Japanese wholesalers in 1997. Low foreign penetration of a wholesale marketing channel may well only mean that general trading companies, and not the

⁴Nihon kanzei kyokai (Japan Tariff Association), gaikoku boueki gaikyoku (Summary report on trade of Japan), Tokyo: The Association, (monthly).

more specialized wholesalers, are the dominant importers.⁵ And even the more specialized wholesalers are not perfectly specialized. Foreign purchases by some wholesalers actually exceed the total imports of the commodities which they principally trade. With these caveats in mind we nevertheless press ahead.

3.1.c. Marketing Channel Characteristics

For core data on marketing channel characteristics we turn to the Medium and Smaller Enterprise Agency, Basic Survey of Commercial Activity and Structure, for the Wholesale Industry of Japan (hereafter “Basic Survey”). In 1979 and 1986 basic surveys included questions about respondents’ arrangements with other firms.⁶ The 1979 and 1986 Basic Surveys (respectively, 4th and 5th surveys) report wholesalers’ survey responses regarding their participation in a contractual agreement (distribution keiretsu). In the detailed instructions that accompanied the survey such an agreement is defined as one having any of the following stipulations: special dealing or preferential treatment in the sale of wares, capital assistance (i.e. equity participation), or management assistance including dispatch of employees. The survey responses indicate whether the wholesaler is the initiator of such a (distribution keiretsu) agreement (and if so whether it pertains to the manufacturer, other wholesalers, or retailers), and whether it itself is subject to such an agreement (and if so whether this is at the initiative of a manufacturer or of other wholesalers). The survey responses also ask respectively whether the wholesaler has proffered specific types of assistance to its suppliers or to its customers.

⁵Unfortunately the data presented in the Census of Commerce do not enable one to discern how the imports of general trading companies are distributed across commodities. There does exist a detailed breakdown of their sales of each type of commodity.

⁶The 1992 survey results are reported at a more aggregated level, not useful for our purpose. The 1998 survey does not include the distribution keiretsu queries.

From my analysis of these data, the typical pattern seems to be one in which a manufacturer imposes vertical restraints upon a wholesaler, who in turn itself imposes vertical restraints on retailers.⁷ I have formed a variable KEIRETSU that is the fraction of wholesaler respondents entered into a distribution keiretsu initiated by the manufacturer.

Immediately I note from Table 3 the strong positive correlation between foreign affiliate share of total wholesale employment FDI and the fraction of wholesalers entered into a distribution keiretsu initiated by a manufacturer (KEIRETSU): 0.65. The foreign wholesale affiliates in 1997 were in this sense concentrated in marketing channels that in 1986 had a high incidence of distribution keiretsu.

Other relevant marketing channel characteristics include ones that fundamentally influence the marginal product of wholesale efforts at resolving externalities or at widening market coverage. Among these characteristics, as discussed in the previous section, are the wholesale profit margin and the number of wholesale steps. Also, whether the good is a consumer product or an industrial one, and if the former, the number of retail outlets. In line with this, I have collected several pertinent variables from the Census of Commerce and the Basic Survey:

from the 1986 Basic Survey:

MARGIN = the average wholesale profit to sales ratio;

and from the 1997 Census of Commerce:

STEPS the fraction of total wholesale sales that were to other wholesalers—a proxy for the number of wholesale steps,

⁷The correlation between fraction of wholesalers entered into a distribution keiretsu initiated by another firm and fraction of wholesalers themselves initiating a distribution keiretsu is 0.86. The correlation between fraction of wholesalers initiating a distribution keiretsu and fraction initiating a distribution keiretsu involving retailers is 0.93.

CONSUMER= a dummy variable equal to one if the product line is a consumer item and zero otherwise, and

#STORES = the number of retailers in Japan specializing in sale of such items if they are consumer products and equal to zero otherwise.

Again, the means and standard deviations of all these and the other variables are in Table 2. We now turn to the statistical analysis of these data.

3.2 Results

Our research focus is the interdependence between employment in foreign affiliate wholesalers, marketing channel characteristics including incidence of distribution keiretsu, and foreign penetration of wholesale distribution channels. We hypothesize that marketing channels with vertical restraints (distribution keiretsu) are more likely to elicit the establishment of foreign wholesale affiliates. If there are no impediments to FDI (in the strong sense that vertical integration between foreign manufacturer and domestic wholesaler is no more costly than between domestic manufacturer and wholesaler), then the marketing channels with distribution keiretsu should be no less penetrated than others even in spite of their implied higher incidence of FDI. To the extent that FDI is inhibited, marketing channels with distribution keiretsu are less likely to be penetrated by imports. Additionally, to the extent that FDI is inhibited, such FDI as does exist ought to induce greater import penetration. To fully explore these possibilities requires a two equation system such as Yamawaki (1991) used to analyze Japanese direct investments in U.S. wholesaling. In this kind of specification foreign import penetration both induces the establishment of foreign wholesale affiliates and is itself enhanced by it.

Simultaneity bias is of concern so we begin the analysis with estimates of reduced form equations. The Table 4 includes estimates of two sets of reduced form equations. The dependent variables are respectively FDI and IMPORTS. These are the employment share of the large Japan-based wholesale subsidiaries of foreign firms and the foreign purchases of Japan-

based wholesalers as a fraction of their total sales not to other wholesalers. To address the problem of limited dependent variable I also estimated the FDI equations using Tobit analysis, easily accomplished with the SHAZAM software. The resulting regression coefficient estimates and t-statistics are very close to the OLS values. These reduced form estimates show that marketing channels with distribution keiretsu (high values for KEIRETSU) tend to have both higher foreign affiliate employment shares and less import penetration. Wholesale marketing channels for consumer products tend to have more foreign wholesale affiliate employment, and those that have more retail outlets tend to have less import penetration. None of the other variables even approach statistical significance. The structural equations are more revealing.

The Table 5 depicts my estimates of the structural equations explaining import shares and FDI (foreign affiliate employment shares). For the import share (IMPORTS) equation this entails a 2SLS estimation procedure. This was not possible for the foreign direct investment (FDI) equation because of the lack of identifying instruments. So instead of an instrumental variable procedure I substituted an earlier observation for import share (IMPORTS82) as a right hand side variable in the equation explaining FDI. I estimated this equation using both OLS and Tobit. The results of these differ little and are highly satisfactory. All of the variables are of the expected sign and statistically significant and together they explain most of the variation in the foreign wholesale affiliate employment share. The import rate equation also has the predicted signs but a much worse fit. As conjectured, import penetration both elicits wholesale foreign direct investment and is itself possibly encouraged by it. Furthermore, in marketing channels where manufacturers form more of the wholesalers into distribution keiretsu (KEIRETSU is greater) the employment share of foreign wholesale affiliates is greater. Import penetration seems to be less in these same marketing channels which might indicate continuing inhibitions on inward foreign direct investment. Channels for CONSUMER products also elicit more foreign direct investment and induce slightly less import penetration. Consumer products with more retail stores (#STORES is greater) also elicit more wholesale foreign direct investment. Beyond this, wholesale product lines with higher average profit to sales ratios (for which MARGIN is greater) and fewer wholesale steps (for which STEPS is smaller) also tend to elicit more wholesale foreign

direct investment. All of this comports with our expectation. In short, the equations expose the important empirical determinates of the pattern of foreign direct investment across Japanese wholesale industries. They also provide qualified support for the findings of Yamawaki (1991) that wholesale foreign direct investment not only follows import penetration but also promotes it.

4. Conclusion

This paper has made a modest contribution to the theory of vertical integration and has attempted to expose the empirical relationship between foreign direct investment in Japanese wholesaling, distribution keiretsu and import penetration. The theoretical innovation is to identify market-widening efforts and resolution of externalities (through administration of a distribution keiretsu) as fundamentally competing activities. They may both have value, but the better performance of the one task raises the costs of the other. To integrate manufacturing and wholesaling can entail the decision to forego market widening efforts altogether to more perfectly resolve externalities. Dealing through an independent wholesaler might entail the opposite. In either case the firm achieves a second-best only. These ideas have application to the pattern of foreign direct investment in Japanese wholesaling, for such investment is indeed an example of vertical integration of manufacturing and wholesaling. In full accord with the logic just related, we have found that marketing channels in Japan with a higher incidence of distribution keiretsu are more likely than others to host wholesalers that are subsidiaries of foreign manufacturing companies.

We have also found evidence that inhibitions on inward FDI still existed in Japan in 1997. Japan, compared to the other developed nations, has long had a vanishingly small stock of inward foreign direct investment. There are many possible explanations. Before 1980, government regulations in Japan were quite inhibiting, as well-documented by Mason (1992). Since then the flow of FDI into Japan has expanded, but the stock still remains small compared to what is observed in the US or the EU. Perhaps this reflects indigenous factors other than government

regulation that make it difficult for foreigners to live and work in Japan or to set up businesses there. These factors include the employment practices of the large Japanese firms that make it difficult to hire executives in mid-career (as suggested by Weinstein (1996)), and also include the myriad difficulties foreigners encounter in mastering the Japanese language and culture. As already mentioned, we have found that foreign penetration of Japanese product markets that elicit distribution keiretsu is likely to be accompanied by direct investment. We have also found that import penetration itself is less likely in these same markets, which indicates that inherent obstacles to foreign direct investment do exist.

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Table 1. Equilibrium.

Parameters: m, λ, g		Equilibrium Values: δ^*, V^*, s^*, e^*			
		vertical integration: $\delta^*=1$; or independence: $\delta^*=0$	value of wholesale activities: V^*	wholesaler effort	
				at resolving externalities among retailers: s^*	at market widening: e^*
$m > \lambda g > g$		$\delta^*=1$	$V^*=1/2 m^2$	$s^*=m$	$e^*=0$
$\lambda g > m > g$	$\lambda^2 g^2/m^2 < 4/3$	$\delta^*=1$	$V^*=1/2 m^2$	$s^*=m$	$e^*=0$
	$\lambda^2 g^2/m^2 > 4/3$	$\delta^*=0$	$V^*=3/8 \lambda^2 g^2$	$s^*=0$	$e^*=1/2 \lambda g$
$\lambda g > g > m$	$\lambda^2 < 4/3$	$\delta^*=1$	$V^*=1/2 g^2$	$s^*=0$	$e^*=g$
	$\lambda^2 > 4/3$	$\delta^*=0$	$V^*=3/8 \lambda^2 g^2$	$s^*=0$	$e^*=1/2 \lambda g$

Table 2. Data on Wholesale Marketing Channels of Japan

Name	Description	Sources*	Average across 4 digit sic wholesale marketing channels in Japan (s.d.)
FDI	Employment in large wholesale subsidiaries of foreign firms in Japan, divided by employment in all wholesale enterprises there, 1997. =EMP97/TOTEMP97		0.011 (0.019)
IMPORTS	Purchases from abroad by all wholesalers in Japan, divided by their total sales not to other wholesalers; July 1, 1996-June 30,1997. =FORPUR97/(SALES97(1-STEPS))		0.093 (0.097)
IMPORTS82	Same as above; July 1, 1981-June 30,1982. =FORPUR82/(SALES82(1-STEPS82))	1982 Census of Commerce	0.055 (0.065)
EMP97	Employment in large wholesale subsidiaries of foreign firms in Japan. ("Large"= with capital greater than 50 million yen. "Wholesale"=primarily engaged in wholesaling. "Subsidiaries of foreign firms"= having greater than 49 pct foreign ownership). End of 1997. (units=persons)	Touyou Keizai	696 (1,841)
TOTEMP97	Employment in all wholesale enterprises in Japan; June 1997. (units=persons)	1997 Census of Commerce	49,132 (59,224)
FORPUR97	Purchases from abroad by all wholesalers in Japan, July 1, 1996-June 30,1997. (units=millions of yen)	1997 Census of Commerce	427,670 (2,078,500)
SALES97	Sales of all wholesalers in Japan, July 1, 1996-June 30,1997. (units=millions of yen)	1997 Census of Commerce	5,978,300 (9,638,700)
STEPS	Fraction of sales of wholesalers in Japan that are to other wholesalers, July 1, 1996-June 30,1997.	1997 Census of Commerce	0.359 (0.095)
#STORES	Number of retail stores specializing in same product line as 4 digit sic wholesale industry (=0 for non-consumer products)	1997 Census of Commerce (vol. 1)	19,074 (31,782)
MARGIN	Net profit divided by sales, average for all wholesalers, Oct. 1, 1985–Sept. 30, 1986	Basic Survey (table 4)	0.041 (0.013)
KEIRETSU	Fraction of wholesalers having entered distribution keiretsu initiated by product makers	Basic Survey (table 54)	0.162 (0.109)

* *Touyou Keizai*=Touyou keizai, Gaishi keikigyō souran '98 (Foreign affiliated companies in Japan, a comprehensive directory, 1998), Tokyo: Touyou keizai shinpousha, April 1998.

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1997 Census of Commerce (vol. 1) = Tsushou sangyou daijin kanbou chousa toukei bu (Ministry of International Trade and Industry, Minister's Secretariat, Research and Statistics Department), Heisei kyu nen shougyou toukei hyou, dai issatsu sangyou hen (soukatsu hyou) (1997 Census of commerce, volume 1, report by industries (summary)), Tokyo: Tsushou sangyou chousa kai, November 1998, Table 10, pp.298-301.

Basic Survey Chousa (table 4; table 54) = Chu shou kigyuu chuu, tsushou sangyou daijin kanbou chousa toukei bu (Small and Medium Enterprise Agency, Ministry of International Trade and Industry, Minister's Secretariat, Research and Statistics Department), Dai go kai shougyou jittai kihon chousa houkoku sho, Oroshiuri gyuu hen (Report on 5th basic survey of commercial activity and structure, As of October 1, 1986, Report of wholesale trade), Tokyo: Tsusan toukei kyokai, February 1989. Table 4, pp.52-9. Table 54, pp.630-637.

Table 3. CORRELATION MATRIX OF SELECTED VARIABLES

57 observations:

IMPORTS82	0.38						
FDI	-0.07	0.01					
KEIRETSU	-0.21	-0.18	0.65				
CONSUMER	-0.21	-0.38	0.27	-0.03			
#STORES	-0.32	-0.24	0.17	0.18	0.52		
MARGIN	0.00	-0.04	-0.03	-0.10	-0.36	-0.02	
STEPS	-0.01	0.26	-0.44	-0.48	-0.16	-0.19	-0.01
	IMPORTS	IMPORTS82	FDI	KEIRETSU	CONSUMER	#STORES	MARGIN

Table 4. Regression Estimates; Reduced Forms

Coefficients and t-stats*						
dependent var	Tobit*		OLS		OLS	
	FDI	P-value	FDI	P-value	IMPORTS	P-value
independent var						
KEIRETSU	0.084 (3.988)	0.000	0.112 (4.149)	0.000	-0.163 (-1.385)	0.171
CONSUMER	0.008 (1.546)	0.127	0.009 (1.374)	0.170	-0.004 (-0.147)	0.884
#STORES	-0.000 (-0.893)	0.375	-0.000 (-0.500)	0.617	-0.000 (-1.531)	0.130
MARGIN	-0.075 (-0.483)	0.631	0.090 (0.437)	0.662	-0.604 (-0.687)	0.494
STEPS	-0.015 (-0.604)	0.548	-0.028 (-0.903)	0.367	-0.076 (-0.563)	0.576
CONSTANT	0.004 (0.311)	0.757	-0.009 (-0.504)	0.614	0.189 (2.532)	0.014
R-SQUARE			0.50		0.09	
SQUARED CORRELATION BETWEEN OBSERVED AND EXPECTED VALUES	0.27					
	74 OBS		74 OBS		74 OBS	

* The coefficients of the Tobit equation are those of the non-normalized variables.

Table 5. Regression Estimates: Structural Equations

dependent var	Coefficients and t-stats*					
	Tobit*		OLS		2SLS**	
	FDI	P-value	FDI	P-value	IMPORTS	P-value
independent var FDI					8.378 (1.049)	0.298
IMPORTS82	0.092 (4.481)	0.000	0.066 (3.936)	0.000		
KEIRETSU	0.091 (7.027)	0.000	0.081 (7.489)	0.000	-0.886 (-1.235)	0.221
CONSUMER	0.018 (4.998)	0.000	0.015 (5.342)	0.000	-0.072 (-1.212)	0.230
#STORES	-0.000 (-1.829)	0.067	-0.000 (-2.183)	0.034		
MARGIN	0.394 (3.549)	0.000	0.251 (2.910)	0.005		
STEPS	-0.025 (-1.851)	0.064	-0.013 (-1.193)	0.239		
CONSTANT	-0.031 (-3.169)	0.002	-0.022 (-2.795)	0.007	0.175 (3.101)	0.003
R-SQUARE			0.67			
SQUARED CORRELATION BETWEEN OBSERVED AND EXPECTED VALUES	0.70				0.026	
	57 OBS		57 OBS		74 OBS	

* The coefficients of the Tobit equation are those of the non-normalized variables.

**Instruments for the 2SLS: KEIRETSU, CONSUMER, #STORES, MARGIN, STEPS.