Non-contractible investments and vertical integration in the Mexican footwear industry

Christopher Woodruff[*]

Graduate School of International Relations and Pacific Studies, UCSD, San Diego, CA 92093-0519, USA

Abstract

This paper examines patterns of integration among manufacturers and retailers, using data from a survey of footwear manufacturers in Mexico. The property rights framework, developed in papers by Grossman and Hart [1986, J. Polit. Econ. 94: 691] and Hart and Moore [1990, J. Polit. Econ. 98: 1119], is differentiated from the standard empirical transactions cost framework. In the context of this industry, the most relevant distinction between the two frameworks is that the property rights framework addresses both the benefits and costs of integration, while the transactions cost framework focuses only on variation in the benefits of integration. We show that the costs of integration are highest where the retailer's non-contractible investment has an important effect on the overall profits from the relationship. Consistent with the property rights framework, the data suggest that integration is less likely in these circumstances. © 2002 Elsevier Science B.V. All rights reserved.

1. Introduction

Transactions cost economics posits that a firm's decision to make or buy a part

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*Corresponding author.
E-mail address: cwoodruff@ucsd.edu (C. Woodruff).

or service is affected by the presence of relationship-specific investments. Vertical integration (making) reduces the risk of hold-up once relationship-specific investments are sunk. The power of this idea, pioneered by Klein et al. (1978) and Williamson (1979) has been demonstrated by an extensive empirical literature.[1] This empirical literature has shown that the benefits of integration increase in the presence of relationship-specific investments. Grossman and Hart (1986) and Hart and Moore (1990) provide a formal model which explicitly considers the costs and benefits of vertical integration. Integration is seen simultaneously to alleviate and to create hold-up risks. Efficient ownership depends not only on the degree of relationship specificity of investments, but also on the importance of those investments in determining the profits of the trading relationship.[2]

Grossman/Hart and Hart/Moore have received considerable attention in the literature, and numerous theoretical refinements have recently appeared.[3] But 9 years after the formal model was published, Hart reported ''Unfortunately, there has to date been no formal test of the property rights approach . . . '' (Hart, 1995, p. 49).[4] This paper attempts to address this gap by providing a test of the property rights model using data on manufacturer-retailer integration in the Mexican footwear industry.

Asset ownership in the property rights framework is driven by the need to balance incentives for non-contractible investments made by two managers. If one manager's investment has a greater impact on the gains from trade or is more

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[1] The empirical literature is surveyed by Joskow (1988) and Shelanski and Klein (1995). Early support for the link between specific investments and integration found in studies of the automobile industry (Monteverde and Teece, 1982), the aerospace industry (Masten, 1984), the electronic components industry (Anderson and Schmittlen, 1984) and the electric power industry (Joskow, 1987) have been confirmed in numerous more recent empirical tests.

[2] In recent papers, Whinston (2000, 2001) compares the transactions cost and property rights frameworks. He independently reaches some of the same conclusions addressed in this paper. In particular, he points out that predicted patterns of integration in the transactions cost framework depend upon the level of specificity while integration depends upon marginal specificity. He also shows that increased specificity may be associated with less integration because specificity can increase the costs as well as the benefits of integration. He then shows that existing empirical research on transactions cost does provide evidence on property rights. Whinston also considers the effect of the buyer's investment level on the seller's returns, and vice versa. That effect is assumed away by Grossman and Hart and is ignored in this paper.

[3] Recent extensions include Nöldeke and Schmidt (1995), Aghion et al. (1994), Garvey (1995), and Halonen (1997).

[4] One exception is Hanson (1995), who uses aggregate data from the Mexican garment industry to test a version of the Grossman and Hart model incorporating risk. More recently, Baker and Hubbard (2000) find that independent ownership of long-haul trucks in the US decreased following technological changes allowing greater contracting scope. Shelanski and Klein (1995) provide no references to tests of the property rights framework.

specific to the relationship (as these are defined below), then that manager should be given stronger investment incentives. For contractible investments, stronger incentives can be written into the contract. But when contracts cannot be written and enforced, owning assets increases investment incentives. Hence, determining the efficient pattern of asset ownership requires an understanding of how both the specificity and the importance of investments made by both managers vary across firms in the industry.

This paper considers relationships between footwear manufacturers producing made-to-order goods and the retailers to whom they sell. A manufacturer must make non-contractible investments which affect the quality of workmanship of the goods produced. Standard purchase contracts allow retailers to cancel delivery of previously ordered merchandise under conditions described below. Cancellation may come after the manufacturer has produced the goods. The possible abuse by the retailer of cancellation rights subjects the manufacturer to risk of losses resulting from the cost of finding alternative buyers for heterogeneous goods. Hence his incentive to invest in workmanship quality is compromised. Integration into retailing by a manufacturer relieves the risk for the manufacturer, but simultaneously creates a risk for the manager of the retail store. Retailer managers make effort investments in providing better service for customers and in learning the tastes of their customers, allowing a better selection of goods on the shelves. But since a non-owning retail manager can be separated from the store (fired), she faces the risk of losing her investment. Hence her incentive to invest is compromised. The efficiency loss in either case will depend on the specificity and importance of the investments made by either manager, discussed in more detail below.

The importance and specificity of the investments made by the two managers vary across different types of products. We focus on how the frequency of integration changes as three product characteristics change: the heterogeneity of goods produced, the quality of materials used in production, and the rate at which fashions change. In the first two cases, the patterns of integration are consistent with the predictions of both the property rights framework and the standard empirical transactions cost framework. With respect to increases in the rate of fashion turnover, however, the transactions cost framework leads to an expectation of more integration and the property rights framework to less integration. This allows the property rights framework to be differentiated from the transactions cost framework. The data indicate that integration is less frequent when fashion turnover is more rapid, suggesting that the stronger incentives store ownership provide for the retailer are needed when her investment is more important to the relationship. Thus the property rights framework is found to do a better job of explaining the patterns of integration than is the standard transactions cost framework.

The motivation of local managers through ownership has also been examined in

the franchising literature.[5] Maness (1996), for example, argues that local owner-ship (franchising) provides a greater incentive for cost minimization by the managers of local outlets. Lutz (1995) examines franchising with a model which follows the property rights framework used in this paper very closely. The relevant actions are 'day to day decisions' made by the local manager. These decisions affect both current and future profits. Contracts, including those governing division of future profits, are incomplete, and strengthening incentives to one party necessarily weakens incentives for the other. Using her framework, Lutz concludes that franchising is more likely when the manager's non-contractible actions have large impacts on the future profitability of the local unit. The manager's incentives are increased by her ability to sell the unit and capture the gains from these investments in future profitability. In company-owned outlets, the incentives of managers are dampened by the possibility that they will be fired before realize the returns to these actions. Lutz model captures the essential tension in the case examined in this paper.

The empirical application of property rights requires not only data but also an understanding of contractual relations among firms in the industry. Such an understanding is needed to match the property rights model to the industry and develop a set of testable predictions. For this paper, the necessary institutional detail of the Mexican footwear industry comes from some 250 interviews conducted by the author during 1992 and 1993. The interviews and resulting data are described in Appendix A.

The next section of the paper provides a brief overview of the industry, focusing on the relationships between manufacturers and retailers. Section 3 relates these relationships to a simple property rights model and develops a set of predictions of patterns of integration in the industry. The data are discussed and the results reported in Section 4. Finally, Section 5 discusses the results and concludes.

2. The industry and manufacturer–retailer relationships

The Mexican footwear industry developed in isolation from world markets. High import tariffs and import license requirements resulted in imports of less than 0.1% of the domestic market in 1987. The domestic industry is characterized by a large number of small producers. Mexico's 1989 Industrial Census counted 2332 manufacturing firms, 87% of which employed fewer than 50 workers. The largest single firm produced less than 5% of industry output. On the retail side, the 1994 Commercial Census counts 32 000 retail establishments. Most production (80%) is

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[5] Lutz provides a survey of the franchising literature more generally. I am unaware of any franchise agreements in the Mexican footwear industry in the time frame of the study. Hence, this ownership form is not considered in this paper.

sold by manufacturers directly to independently owned retailers (Boston Consulting Group, 1988).Wholesalers and other middlemen, who intermediate much of the trade in the global footwear market, handle only 12% of Mexican production. According to the Boston Consulting Group study, 4% of industry production is exported and 4% is sold through stores owned by manufacturers.[6] While the Boston Consulting Groups study indicates that the overall level of sales through integrated firms is low, the data discussed below indicate that forward integration covering some part of sales is much more common. Additionally, integrated firms play a much more significant role in certain segments of the industry.

Manufacturers and retailers meet twice each year at 'shoe fairs'. A fair is held in the fall for the following year's 'spring–summer' season and a fair is held in the spring for the 'fall–winter' season. At the shoe fair, each manufacturer displays the styles which he is willing to produce, and retailers place orders with manufacturers to deliver specific size/style/color combinations several months hence. A typical manufacturer receives orders from at least a few dozen retailers and a typical retailer places orders with at least a half-dozen manufacturers. Manufacturers produce goods to fill the orders, and then deliver the goods to retailers (or fail to do so), who then place the goods on their shelves and pay the manufacturers (or fail to do so). The orders specify the size, styles, colors and quantities of footwear to be delivered by the manufacturer to the retailer several months in the future. The written orders generally reference the quality of materials to be used in producing the product, but there is no written reference to the quality of workmanship.[7]

The majority of the goods produced by independent manufacturers are produced to fill the specific orders of retailers. To produce goods, manufacturers must make physical investments in machinery and inputs. The quality of goods produced depends in part on these investments. Production of high quality goods also requires the ongoing human capital investments of the factory manager. His efforts in organizing his workers, monitoring production, and so on, affect the quality of workmanship of the goods produced. Quality of workmanship can be thought of as affecting the durability of the product and/or the finish quality of the product. In interviews, manufacturers openly discussed problems with the finishing quality of their goods — glue seeping out where the sole is attached, seams not sewn

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[6] The retailer census data are reported at the establishment level, and do not provide information on the importance of chains of retail stores. A 1988 study by Boston Consulting Group estimated that 41% of sales went to independently owned retailers, 20% to retail chains, and 19% to department stores. While there were two large retail chains with around 400 stores each, the interviews suggest that more commonly the retail chains were small, with less than a dozen stores.

[7] While the manufacturer–retailer nexus has undergone rapid technological change in the United States recently, there was little evidence of change in Mexico at the time of the interviews. One manufacturer reported receiving faxes from company-owned retail outlets on a weekly basis. Another was beginning a catalogue sales operation involving use of computer-transmitted data. But the overwhelming majority still used only paper and telephones in the order and delivery process.

straight, and threads dangling from the end of seams, among other examples.[8] We will be concerned in part with his incentives to make these effort investments. They are of particular relevance to the property rights framework, because they cannot easily be contracted for. Moreover, the workmanship quality which results from these efforts cannot be easily described in a contract.

Likewise, retailing involves investments in physical assets, the most important of which is the retail store itself. But the profit of the retail store also depends on developing a client base. To do this, the retail manager must make effort investments to provide high quality customer service. She must also choose the optimal mix of goods from among those offered by manufacturers at the shoe fair. Deciding which style to buy requires learning about her customers' tastes; learning more about the tastes of her customers increases the chance of the retailer being successful. The characteristics of the Mexican industry make the retailer's decisions more relevant. Recall that manufacturing is dominated by a large number of small manufacturers (most with fewer than 100 employees). In contrast, for example, to the footwear industry in the United States, very few of the manufacturer's brand names are known to final consumers. In interviews, even the manufacturers claimed that buyers' loyalty accrues to the retailer rather than the manufacturer brand. In segments such as women's dress shoes, literally thousands of different styles are displayed at the shoe fair.[9] Regardless of whether the retail manager owns the store or manages a store owned by a manufacturer, the daily contact that the retail manager has with the ultimate buyers gives her an advantage over the manufacturer in matching styles with tastes. Both customer service and learning about customers' tastes involve effort investments made by the retailer. As with the manufacturer's efforts, these are difficult to contract for.

In what sense are these investments specific to a given relationship? The cost of severing a specific relationship increases in two steps. First, in accepting the order, the manufacturer commits a portion of his production capacity to serve the retailer. At the same time, the retailer commits a portion of her shelf space to sell the goods from the manufacturer. With the matching process completed and the shoe fair finished, a manufacturer has a more difficult time finding a retailer in need of goods, and vice versa. Therefore, cancellation of an order by one side imposes some cost to the other side. However, given the number of clients (suppliers) a typical manufacturer (retailer) has, at this stage the cost of cancellation — and thus the hold-up threat — is not great.

Once the goods are produced, the degree of specificity is significantly increased,

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[8] The concerns over finish quality were mentioned much more frequently than concerns for durability in interviews with manufacturers and retailers in the industry. State of the art equipment can make finishing quality less variant in this industry. However, the overwhelming majority of manufacturers interviewed for this study did not use state of the art equipment.

[9] When asked where their designs came from, most manufacturers interviewed referenced Italian fashion magazines and footwear fairs in the United States. Some of the larger manufacturers also traveled to fairs in Europe. The majority of those interviewed did not develop their own new fashions.

at least from the manufacturer's perspective. A manufacturer produces a very specific basket of goods to fill a retailer's order — 12 pairs of style number 150 in red, size 6. In segments of the industry characterized by the production of a wide range of goods, finding an alternative buyer for a specific basket of goods may be very costly.[10] Indeed, manufacturers in some segments of the industry report that when merchandise is returned by retailers, the goods are dumped to warehouses in Mexico City, typically for 50% of their price. When returned goods are dumped on wholesale markets, the quality of workmanship has little effect on the price received, and thus the return on the investment in workmanship quality is essentially zero. The specificity deriving from the process of matching manufacturers and retailers is similar to what Masten et al. (1991) and Pirrong (1993) term 'temporal specificities' (see also Hubbard, 1999).[11]

The retailer's investment in building a client base accrues at least in part to the store rather than to the manager. As a result, the manager's investment is specific to the store. An important part of her investment in building a customer base would be lost if she were separated from the store. Hence, her investment is specific to the manufacturer when the manufacturer owns the store. Investments made by a retailer who owns her store are unlikely to be specific to a given manufacturer, for reasons discussed further in Section 3 below.

Both the transactions costs and property rights frameworks depend on contracts being incomplete. The contracting setting just described appears to be a straightforward one which would allow for complete contracts for delivery of specified goods on a specified date. Nevertheless, the contract remains incomplete, because either side has an out which is recognized by both sides to the transaction. The manufacturer may claim that problems with machinery or other events beyond his control prevented his delivering the goods; and retailers have the right to return

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[10] The situation is analogous to the production of monogrammed garments. Suppose a client orders a shirt with the initials 'TQW' in size large and color red. Is the good, when produced, specific to the relationship between the manufacturer and customer? In the sense that there are probably dozens of people in the world with the initials TQW who are potential buyers, there is nothing relationship specific about the sweater. But the high cost of finding one of these alternate buyers who also wants a large, red sweater means that the manufacturer would suffer a loss if the customer canceled her order after the good was produced. Thus, the sweater is relationship specific in an absolute sense; because of reselling costs, it has a lower value outside the relationship. Makers of merchandise of this sort typically require deposits, perhaps to protect themselves from the potential of being held up by customers. Paying a deposit may shift the hold-up risk from manufacturer to customer, but does not eliminate it.

[11] Stone et al. (1992) discuss similar concerns for production-to-order in the garment industries in Chile and Brazil. Several manufacturers mentioned the special risk of producing goods to fill orders from US buyers, given the larger foot sizes in the US. The fear expressed was that canceled foreign orders would be even more difficult to re-sell than domestic orders, since manufacturers have far fewer foreign clients than domestic clients and since search costs are higher in foreign markets.

defective merchandise. Since the quality of workmanship is itself non-contractible it is not possible for a third party to force the retailer to accept the order.[12] The interviews indicated that retailers and manufacturers have frequent disputes about quality, with retailers demanding some discount or returning merchandise. Most manufacturers can recount at least one occasion when merchandise was returned months after delivery on the grounds it was defective. Although it would seem that such extreme behavior by retailers could be discouraged by the threat of court action, no manufacturer told of pursuing such cases in the courts.[13]

Both sellers and buyers must make investments which cannot be contracted for. The investments are specific to given buyer–seller relationships, at least in some circumstances. The profits from trade are affected by these investments. These conditions meet the basic assumptions of the GHM framework. In the next section, we develop this framework more formally.

3. Property rights and transactions costs

We first map industry trading relationships to a simplified version of the property rights framework developed by Grossman, Hart and Moore. Later, we derive predicted integration patterns from the transaction cost framework.

Consider a trading relationship between a manufacturer and a retailer. The manufacturer manages a factory and the retailer manages a store. For reasons that will become clear later, we assume the factory is always owned by the manufacturer, but the store may be owned by either manager. The manufacturer makes an investment which we denote by m and the retailer makes an investment which we denote by r. Trade takes place after the investments are sunk, when the relationship has a value $V(m, r)$. Complete contracting over the precise terms of trade is not possible before the investments are made because there are too many possible states of the world. Instead, after the investments are sunk and the uncertainties are resolved, the manufacturer and retailer bargain over the terms of trade. We denote the value of the manufacturer's and retailer's investments outside the relationships as $M^j(m)$ and $R^j(r)$, respectively, where the superscript $j = I, N$ indicates whether the factory and store are both owned by the manufacturer (integrated) or owned separately (non-integrated), respectively.

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[12] The difficulty in writing down the precise quality specifications makes ex ante contracts infeasible. Note, however, that once the goods have been produced, a much more straightforward contract is possible. For example, the two sides could mark the good with an 'X' and write a contract that says ''Goods marked with an X will be delivered''. The situation matches the GHM framework, with ex ante incomplete contracts but ex post complete contracts.

[13] In these more extreme cases, the inefficiency of the Mexican legal system may factor into the decision of manufacturers not to rely on courts. Contract enforcement on the industry is discussed in more detail in Woodruff (1998). Contracting problems of this sort are not unique to Mexico. For the footwear industry in Taiwan, Hsing (1998) describes the role trading companies play in resolving these quality/return disputes.

In the property rights framework, investment decisions depend on the marginal value of the two investments inside and outside the relationship. The standard assumption is that post investment bargaining begins with each agent threatening to withdraw from the relationship. The gain in profit obtained by moving from these threat points ($M^{j}(m)$ and $R^{j}(r)$) to the ex post optimal outcome ($V(m, r)$) is assumed to be split evenly by the agents (the Nash bargaining solution). Ownership of assets is important here because ownership conveys the right to use the asset outside the relationship should bargaining break down, and hence affects an agent's post investment bargaining position.

The agents choose investments m and r with the post investment bargaining in mind. Assuming linear investment costs, the first order conditions for optimal investment for the manufacturer and retailer, respectively, in the integrated case are:

$$\frac{1}{2} \frac{\partial V}{\partial m}(m, r) + \frac{1}{2} \frac{\partial M^{\mathrm{I}}}{\partial m}(m) = 1$$

$$\frac{1}{2} \frac{\partial V}{\partial r}(m, r) + \frac{1}{2} \frac{\partial R^{\mathrm{I}}}{\partial r}(r) = 1$$

We denote the levels of m and r which satisfy these conditions as m^{I} and r^{I}, and the value of the integrated relationship as $V(m^{\mathrm{I}}, r^{\mathrm{I}})$. The corresponding first-order conditions for the non-integrated case yield the value of the non-integrated relationship, denoted $V(m^{\mathrm{N}}, r^{\mathrm{N}})$. Integration will be optimal when $V(m^{\mathrm{I}}, r^{\mathrm{I}}) > V(m^{\mathrm{N}}, r^{\mathrm{N}})$, and non-integration will be optimal in the opposite case.

Investments differ from first best only to the extent that the marginal value of the investment outside the relationship differs from the marginal value of the investment in the relationship. We assume that the level of the investment is increasing in the return and that the marginal value of an agent's investment outside the relationship is nondecreasing in the ownership of assets,[14]

$$\frac{\partial M^{\mathrm{I}}(m)}{\partial m} \geqslant \frac{\partial M^{\mathrm{N}}(m)}{\partial m} \quad \text{and} \quad \frac{\partial R^{\mathrm{N}}(r)}{\partial r} \geqslant \frac{\partial R^{\mathrm{I}}(r)}{\partial r}.$$

Under these assumptions, integration (manufacturer ownership of the store) results in a higher investment by the manufacturer and a lower investment by the retailer, $m^{\mathrm{I}} > m^{\mathrm{N}}$ and $r^{\mathrm{I}} < r^{\mathrm{N}}$.

How does a change in asset ownership affect the value of the relationship? Consider a change from integration to independent ownership. Since the retailer's bargaining position is strengthened and the manufacturer's is weakened, r increases and m decreases. The magnitude of these changes in r and m depends on how much the shift in asset ownership affects the value of the two investments

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[14] De Meza and Lockwood (1998) show that the positive association between asset ownership and investment incentives is sensitive to the precise structure of the ex post bargaining game. We discuss this further at the end of this section.

outside the relationship. The resulting change in $V(m, r)$ depends on the changes in investment levels and on the marginal value of the two investments, $\partial V/\partial m(m, r)$ and $\partial V/\partial r(m, r)$. The first effect derives from the specificity of the investment; the latter effect from the importance of the investment to the relationship.

3.1. Transactions cost

Williamson (2000) identifies several significant differences between the property rights framework and transaction cost economics. While ex post bargaining costs are the main catalyst in transactions cost economics, the property rights framework ignores these costs completely by assuming that ex post contracts are costlessly negotiated. The transactions cost framework also assumes that the two assets are jointly managed; in the property rights framework, they cannot be. Integration resolves hold up problems in the transactions cost framework, but not in property rights framework.[15]

But there is common ground as well. Relationship-specific investments are central to both theories. Specific investments are ''the big locomotive to which transactions cost economics owes much of its predictive content'' (Williamson, 1985, p. 55). Klein et al (1978) provide a succinct summary of the predictions of transactions cost theory: ''as assets become more specific and more appropriable quasi rents are created . . . ceteris paribus, we are more likely to observe vertical integration''. The empirical literature testing transactions cost theory has focused on the relationship between integration decisions and the level of quasi-rents. Variation in the level of specific assets causes variation in the benefits of vertical integration.

Williamson (1985, Chapter 6) recognizes that there are also costs to vertical integration. These costs arise in part because control rights shift when firms are integrated. Discussing the purchase of an owner-managed supplier, Williamson notes ''One hazard is that the supplier will be 'promised' a favorable net receipt stream . . . only to learn that his employment has been terminated'' (1985, p. 138). The ability to fire the manager leads to the use of lower powered incentives (e.g., fixed wages rather than profits). I am unaware of empirical studies which have identified how the variation in the costs of integration affects the likelihood of observing integrated firms.[16]

Although the notation above comes from the property rights framework, we can

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[15] The level and specificity of ex ante investment might be endogenous to the integration decision, as Riordan and Williamson (1985) point out.

[16] This is not to say that the existing empirical studies do not recognize costs of integration, but only that variation in the costs of integration are not driving force behind the empirical results. For example, Shelanski and Klein (1995), reviewing the literature, conclude ''the probability of observing a more integrated governance structure depends *positively* on the amount or value of relationship-specific investments involved . . . '' (p. 338, emphasis added).

use it to indicate specificity in the transactions cost framework. The relevant measure in the transactions cost framework is the lump sum difference between the value of investments inside and outside the relationship, $V(m, r) - M^j(m) - R^j(r)$ given some fixed level of investments (m, r). We refer to this measure of the level of quasi-rents as the level of absolute asset specificity, to differentiate it from the marginal level of specificity on which the property rights framework rests.

The distinction between the transactions cost and property rights frameworks may be clarified by the following example. Suppose initially that the specificity of the investments made by the two agents makes forward integration by the manufacturer optimal. Now suppose the product is changed in such a way that the specificity of the investment made by the retail manager is increased. Perhaps clients tastes become more idiosyncratic so that the retail manager's knowledge of clients at one store has less value if the manager is fired and finds work at another store. Then transactions costs theory would lead us to expect even stronger incentives for integration. The property rights framework, on the other hand, suggests the incentives for integration are weakened by this change. The increase in the specificity of the retailer's investment means that she needs stronger investment incentives. Since ownership of assets conveys bargaining power, her incentives are increased when she owns more assets. Of course, if the increase in specificity is extreme enough, she may optimally own both assets. But there will generally be some intermediate range in which non-integration is optimal. It is this dynamic that we examine in the rest of the paper in the context of the Mexican footwear industry.

3.2. Predicted patterns of integration

Deriving clear empirical predictions from the property rights framework is challenging, because there are four effects which must be considered. We can generally measure whether an investment becomes more specific or less specific, more important or less important, but judging the magnitude of the change is much more difficult. Therefore, unless all four effects tend in the same direction, the framework will make an ambiguous prediction. In at least one case in this industry, however, the property rights framework produces an unambiguous prediction.

We begin by considering ownership of the store.[17] Ownership of the factory is discussed later; for now we assume the factory is owned by the manufacturer. Integrated ownership means ownership of the store by the manufacturer; non-integrated ownership means ownership of the store by the retailer.

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[17] Grossman and Hart (1986) refer to the importance of the ownership of the client list in the insurance industry. They find that insurance salesmen are more likely to own the client list when their effort investments are more important to the relationship. Ownership of the store in this paper is analogous to ownership of the client list.

Firms in the industry can be differentiated according to three characteristics of the goods they produce. First, the goods differ in the speed with which styles change. Goods in some market segments change styles every 6 months while goods in other segments have styles which endure 10 years. Second, producers in some segments offer a much larger selection of products. For example, a producer of women's dress shoes may offer as many as 200 distinct styles, each produced in any of 10 colors. At the opposite extreme, producers of industrial boots typically offer only a few styles in brown and black. Finally, within any segment, firms can be differentiated by the quality of the materials they use. Some firms produce high end products and others produce products aimed at the mass market. The former use high quality leathers and soles, the latter lower quality leathers or synthetics and lower quality soles.

When an integrated manufacturer fires a retail manager, the manager is separated from her clients. The investment in building a client base made by a retail manager who does not own her store is worth little outside the relationship: $\partial R^{\mathrm{I}}/\partial r$ is close to zero. Since the retailer's investment does have value inside the relationship ($\partial V^{\mathrm{I}}/\partial r > 0$), the retail manager in the integrated firm under invests. But the non-integrated retailer, who owns the store, cannot be separated from her client base. Severing a relationship with a single manufacturer has a much smaller effect on the value of her investment: $\partial R^{\mathrm{N}}/\partial r$ is close to $\partial V^{\mathrm{N}}/\partial r$. As a result, the non-integrated retail manager chooses a higher investment level (r) than the integrated retailer manager.

How important is the retailer's investment? As fashions change more quickly, the retailer's investment in learning about customer tastes is more important. A manufacturer who owns a store might be expected to be able to make reasonable decisions about which goods should go on the shelf himself if he has past sales records to guide him. When styles are new, however, past sales will be less useful in stocking decisions, and the manager's information about her clients' tastes will be more valuable. A proper matching of store inventory to demand thus depends more heavily on the retailer's knowledge. So the value to the relationship of the extra investment r made by the retailer ($\partial V^{j}/\partial r$) increases as the rate of fashion change increases. Thus, the advantage of non-integrated ownership increases when the rate of fashion turnover increases.

Of course, when the retailer owns the store, the manufacturer does not. We must also consider how the manufacturer's investments are affected by the rate of fashion turnover, in both the integrated and non-integrated cases. (Recall that for now we are assuming the manufacturer always owns the factory.) With respect to both the level and the importance of the manufacturer's investment, the effects of store ownership appear to be small. First consider how ownership of the store by the manufacturer affects the level of his investment. In high fashion segments, goods returned by retailers are more likely to be obsolete and harder to resell. The independently owned retailer's bargaining position is strongest when the goods have little value on the market (when the style did not 'hit'). But there is little that

can be done with merchandise which is out of style. Merchandise not sold in a customer's store is unlikely to be sold in manufacturer's stores, either. Second, the manufacturer is dependent on the retail manager to determine a proper match of styles. In the end, manufacturers in high fashion segments are dependent on the manager of the store more than the store itself. For both of these reasons, forward integration does little to protect manufacturers in high fashion segments. The threat points of integrated and non-integrated manufacturers ($\partial M^N / \partial m$ and $\partial M^1 / \partial m$) move together as fashion turnover increases.

When fashions change quickly, the manufacturer's investment in workmanship quality becomes less important ($\partial V^j / \partial m$ decreases), regardless of who owns the store. Product durability becomes less important, and there is no reason to expect that the importance of finishing quality is affected by the rate of fashion turnover.

In sum, the retailer's investment is more important in segments characterized by high fashion turnover. Her investment level is affected by ownership of the store. The manufacturer's investment level is not affected by ownership of the store. His investment is less important in segments characterized by high fashion turnover. The property rights framework yields a clear prediction that the retailer's ownership of the store should increase as fashion turnover increases.

In addition to fashion turnover, we also examine the effect of product heterogeneity and the quality of materials used in production. When the number of styles in a given segment increases, the manufacturer is more likely to have to sell returned goods on the wholesale market, where the return to workmanship quality is low. That is, as the number of styles increases, $\partial M^N / \partial m$ decreases and the specificity of the manufacturer's investment increases. Relative to its optimal level, the manufacturer's investment level decreases as heterogeneity increases. Increased heterogeneity will have less impact when the manufacturer owns the store, especially in segments where styles change slowly and obsolescence is not an issue. By itself, this implies that integration should increase as the number of styles increases. However, the importance of the retailer's investment in matching customers to styles also increases as heterogeneity increases. The retailer effect is offset by the ability to use past sales data when fashions change slowly, but we are left without a clear prediction of the effect of product heterogeneity on integration.

Finally, workmanship quality and customer service are both complementarity to the quality of materials used in production. Complementarity implies that the importance of the manufacturer's investment in workmanship and the retailer's investment in customer service increases with the quality of materials used in production. The quality of materials should have little effect on the value of goods outside the relationship ($\partial M^j / \partial m$ and $\partial R^j / \partial r$). Because we have no way of quantifying the manufacturer and retailer effects, the property rights framework gives no definitive prediction on the on the relationship between the quality of inputs and the level of integration.

Thus far, we have considered only ownership of the retail store. Who should own the factory? We first ask whether the retailer's investment incentive is

compromised by not owning the factory. The retailer does face some hold up risk when she does not own the factory. The manufacturer can hold her up by threatening not to deliver goods. Presumably, these particular goods were chosen by the retailer because they were the optimal goods for her shelf space. Non-delivery costs the retailer something. But does the threat of non-delivery affect her effort investment? According to the property rights theory, it does so only if the *marginal* value of that investment is lower in the event of hold up. Those retailers who have invested more in learning about their customers will find this knowledge useful in identifying appropriate replacement goods. That is, $\partial R / \partial r$ is not affected by ownership of the factory. Because the retailer's relevant investment has value even when a given manufacturer fails to deliver goods, her incentive to invest is not significantly enhanced by owning a factory.[18] On the other hand, the manufacturer's investment is clearly affected by decisions over how the factory is used.

Thus, the property rights framework leads us to expect that where integration occurs, manufacturers should integrate forward rather than retailers integrating backward. Limited evidence from the 60 extended interviews in Leon provides support for this. Of the 16 integrated firms interviewed, 13 started as manufacturers, two started manufacturing and retailing simultaneously, and only one started as a retailer and integrated backward in production.

For the standard empirical transactions cost framework, the predictions are straightforward. Increased fashion turnover and increased product heterogeneity both increase the absolute specificity of the manufacturer–retailer investments. Hence, integration should be more frequent among firms in segments with a rapid rate of style changes and firms in segments with a large number of styles. The transactions cost framework does not separate the specificity of investments from the importance of investments. But for a given level of specificity, an increase in the importance of the investment results in an increase in the quasi rents over which firms bargain ex post. Hence, the incentive to integrate should increase as the importance of investments increases. Most importantly, then, the two frameworks produce opposite predictions with respect to the effect of the rate of fashion change on integration.

Two issues warrant further discussion before proceeding to the data. First, the property rights framework has been developed in the context of a relationship between a single buyer and a single seller. In the case of an integrated firm, the critical relationship is between a retail manager and a single manufacturer, the

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[18] Retailers can also 'over book' orders to protects themselves from nondelivery, canceling some orders in the event all manufacturers deliver. Manufacturers can also over book their production capacity. This may protect them from having idle capacity in the event orders are canceled before production, but this does not protect them from the cost of cancellations after orders are produced. They cannot under-produce in anticipation of post-production cancellation, since each order is unique.

owner of the store.[19] But a non-integrated manufacturer generally sells to many different retailers. His decision to integrate forward into retailing must take into account how integration will affect his relationships with these retailers. This is less of an issue than it might appear. Goods produced in Leon are sold to a national market. Retailers in one city do not generally compete with retailers in another. Forward integration will generally involve entry into only a few cities. We would not expect relationships with retailers in other cities to be much affected by this. Unfortunately, data are not available to examine third party effects in more detail.

Second, De Meza and Lockwood (1998) point out that the positive association between asset ownership and incentives depends on the nature of the ex post bargaining game. They show that under different assumptions, the stronger party in the bargain may be paid her outside option, and the weaker party given the residual profit stream. In that case, an agent's ex ante incentives may be strengthened by taking away his assets, rather than by giving him more assets. In their words, assets may be used as sticks as well as carrots. In our case, the retailer's investment is optimal (or nearly so) when she owns the store. Regardless of the nature of the ex post bargaining game, the store cannot be used as a stick to motivate the retailer. It is possible, however, for the store to be used as a stick against the manufacturer. That is, we might observe independent ownership of stores when the property rights framework as adapted above indicates that integrated ownership is optimal.

Table 1 summarizes the predictions for each framework. In the property rights framework, the table shows the separate effect of changes in $\partial V^j / \partial m$ and $\partial V^j / \partial r$

Table 1
Summary of predicted pattern of Integration

	Manufacturer: effect of		Retailer: effect of		Effect on integration	
	$\partial V^j / \partial m$ $\partial M^j / \partial m$		$\partial V^j / \partial r$ $\partial R^j / \partial r$		Property rights	Transactions cost
Increased rate of fashion turnover	↓	0	↑	0	Less	More
Increased number of styles	0	↓	↑	0	No clear prediction	More
Increase in quality of materials used	↑	0	↑	0	No clear prediction	No clear prediction

[19] Ownership of multiple retail outlets means a relationship between a single manufacturer and several store managers. The manufacturer's actions with respect to one manager may affect his relationships with the other managers. In this case, we assume that the retailers are identical, and their treatment symmetric.

on the one hand and changes in $\partial M^j / \partial m$ and $\partial R^j / \partial r$ on the other. The importance of an investment increases as its marginal value in the relationship increases, and the specificity of an investment increases as its marginal value outside the relationship decreases.

4. Data and empirical results

Data on the independent variables discussed above were obtained from the manufacturer's industry association in the city of Leon, Guanajuato. These data correspond to 1992. The dependent variable, a measure of whether firms are integrated into retailing or not, was not included in the association data set, but was obtained from the 60 detailed firm-level interviews conducted by the author and from a series of very short interviews of manufacturers displaying goods at the spring 1993 trade show in the city of Leon. The necessary data are available for 215 manufacturers, 31% of whom are integrated into retailing. The interviews and data are described further in Appendix A. Table 2 provides a summary of the dependent and independent variables used in the regressions.

Data are seldom as clean as theories. The majority of the firms in the sample are owner-managed, as in Grossman and Hart's model. Among the 60 firms participating in the more detailed interview, just over 80% were owned by the manager and his immediate family. But firms produce more than one product and sell to many retailers. Data are not available to examine each relationship between a manufacturer and a retailer. Rather, we have information on the characteristics of manufacturers and whether or not they own any retail outlets. Further, while the sample comprises substantially all of the firms attending the shoe fair in Leon (about 27% of the registered firms located in or near Leon), this is not an entirely random sample. Finally, there is reason to be concerned about reverse causation with respect to some of the independent variables. Perhaps integrated firms produce a broader line of products because they integrated. Producing in more segments increases the likelihood of producing in the most heterogeneous segments. Each of these issues is addressed below. Discussion of alternative explanations of the results is left the next section.

4.1. The dependent variable

The variable measuring integration is 1 if the manufacturer sells any portion of production through owned stores which are located apart from the factory, and 0 otherwise. Data on the specific level of sales through manufacturer-owned stores is not available for the whole sample. Among the integrated firms surveyed more extensively, an average of 34% of production is sold through the firm's own store. In property rights theory, owning stores through which even a minority of production is sold may significantly change the marginal value of the manufactur-

Table 2
Summary of data

Category	No. of firms	% Fashion change	% Women	% Dress	% High quality, Meas. 1[a]	%High quality. Meas. 2[b]	% Integrated
Women's dress/sandal	33	200	100	88	64	48	39
Women's casual/semi-dress	40	75	100	0	27	55	35
Men's casual/semi-dress	12	65	0	0	8	67	25
Tennis	20	55	0	0	60	60	15
Children's dress/causal	24	50	0	0	42	42	21
Men's dress	40	40	0	100	78	38	33
Western boots	28	30	50	0	68	68	39
Industrial boots	4	10	0	0	100	100	0
Women's basic pump ('Valerina')	2	10	100	0	100	100	50
Children's school/orthopedic	12	10	0	0	50	50	33
Quality materials measure 2							
High	107	70	43	27	17	NA	39
Low	108	71	40	37	80		23
Women							
Yes	89	113	NA	33	48	52	40
No	126	42		31	56	48	25
Dress							
Yes	69	107	42	NA	74	42	35
No	146	54	41		41	53	29

Multi-product firms categorized by product with highest fashion turnover.

[a] High quality defined by leather soles and medium or high quality leather uppers. Tennis shoe made with medium or high quality leather uppers are considered high quality regardless of sole.

[b] Higher standard for dress shoes, lower standard for casual shoes as described in text.

er's investment in the event that the relationship breaks down ($\partial M^{I}/\partial m$). Recall that the return on workmanship quality for goods sold in the wholesale market is essentially zero. If instead of dumping the goods on the wholesale market, the manufacturer sells them through his own stores, then he is likely to realize some return on his investment in workmanship quality. There are four manufacturers whose owners are half-owners of stores. These manufacturers are counted as integrated.

4.2. The independent variables

The dimension which most clearly differentiates the transactions cost and property rights theories is the speed with which fashions change in various segments. The speed of fashion change varies with the type of product the manufacturer makes. Firms are divided into 10 separate product segments, which are shown in Table 2. The rate that styles change in each segment was estimated

from data obtained in the 60 detailed interviews. Managers were asked, ''How many times do you change styles each year?'' and ''Each time you change styles, what percentage of the styles you produce are new?'' These responses were used to estimate the variable FASCHNG, which indicates the number of times per year styles change. A manufacturer that changes all of the styles he sells twice a year (as manufacturers of women's dress shoes do) has a value of 200% for FASCHNG. At the opposite extreme, producers of industrial boots, children's shoes and women's basic pumps change styles annually, and only about 10% of styles are new each year. Faster style changes correspond to greater absolute specificity and to greater importance and marginal specificity of the retailer's investments.

Across the industry, two types of manufacturers produce significantly more heterogeneous products. Women's shoe manufacturers use the greatest variety of colors of leather and dress shoe manufacturers typically produce the greatest number of different styles.[20] In the regressions below WOMEN and DRESS are used to indicate manufacturers who produce goods which are more difficult to resell if orders are returned or canceled after production is complete. The production of these manufacturers has a greater degree of absolute relationship specificity.

The quality of materials used in production affects the importance of the manufacturer's investment. This is derived from information on the materials used in construction of the sole and the 'upper' of the shoe. The groups for uppers are based on the price of each material per square decimeter. From highest to lowest, the groups are: (1) exotic and high quality leathers; (2) mid-range leathers; (3) low quality leathers; and (4) synthetic and cloth. The soles are divided by: (1) leather; (2) synthetic; and (3) rubber. Firms are grouped as high-end or low-end according to the materials used. The intention is to find a measure which identifies firms producing high quality products relative to their peers.

The best single indicator of a high quality manufacturer is the use of a leather sole. But leather soles are much less common in some segments (e.g., athletic shoes) than in others. As a first estimate, those products made with leather soles and medium or high quality leather uppers are categorized as high quality, with only the upper considered for athletic shoes. The percentage of firms with products categorized as high quality by this measure is shown in column 5 of Table 2. As the table suggests, dress shoes are much more likely to be made with leather soles than casual shoes. The quality of materials measure used in column 6 makes two

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[20] Among the sample of 60 firms who were interviewed extensively for the study, the average number of styles produced per firm is 66 for firms producing dress shoes, 46 for casual shoes, 37 for western boots, 20 for tennis shoes and seven for industrial boots. These averages were not used directly because of concern for reverse causation — that owning stores might lead to firms producing a greater variety of products. Regardless of store ownership, however, the nature of the product segment leads dress shoe manufacturers to produce a greater number of styles.

adjustments. Casual shoes made with synthetic leather soles and at least medium quality leather uppers are considered high quality, and dress shoes made with medium quality leather are considered low quality. The second measure comes closest to producing and even division of firms in each segment, and is used in the regressions reported here.[21]

Two other variables are used to control for characteristics of the firms. Factory employment is included, with more integration expected among larger manufacturers, both because of their larger scale of operation and because size is a proxy for access to capital. The number of product segments in which a firm produces is also included. Integrated firms are more likely to have diversified production. Thus, a firm may have started by producing men's casual shoes and begun to produce women's shoes after integrating to stock its own store shelves. If such occurrences are common, there will be a spurious correlation between women's shoe production and integration. The number of lines is included to control for this source of correlation. The regressions are also run with the sample limited to those firms producing in only one segment.

4.3. Multi-product manufacturers

Many of the firms in the sample produce more than one product. A decision must be made about how to categorize these firms. For example, should a firm producing one product which has a rapid style turnover but is made from low quality materials (e.g., low quality women's dress shoes) and another product which is subject to less rapid fashion turnover but which is made from higher quality materials (e.g., high quality men's casual shoes) be categorized by the first or the second product? The theory does not allow us to determine the precise efficiency tradeoff between the investment importance, heterogeneity, and fashion turnover. Regressions are presented below identifying multi-product companies two different ways. The first rule identifies the product with the fastest fashion turnover and uses the quality of materials and heterogeneity indicators associated with that variable. The second rule identifies the highest quality product a firm produces, and then uses the rate of fashion turnover and heterogeneity indicators associated with that.[22] In the example above, the first categorization method identifies the firm by the low-quality women's dress shoe and the second by the high-quality men's casual shoe. Results which limit the sample to those firms for

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[21] Variation in the categorization rule produce similar results. An alternative measure of investment importance is available in the data set. The annual census conducted by the industry chamber asks manufacturers to categorize their output as 'Fino', 'Entre-Fino' or 'Economico,' meaning fine, middle-grade, and economy. The entire analysis was repeated using these responses, with no significant differences in the results.

[22] A third alternative would be to identify the most heterogeneous good (women's dress shoes, then other dress or other women's shoes, and so on) and then use the fashion turnover and materials quality associated with that. This rule produces results similar to the fashion turnover rule.

which the two rules produce the same independent variable measures are also presented.

4.4. Probit results

Consider a linear model where changes in independent variables cause changes in the effects of hold-up and, hence, on the profits from integration. Such a model might be written as:

$$I_i^* = \beta' X_i + \gamma' Z_i + \mu_i$$

where X_i is a vector of variables reflecting the fashion segment and market niche of the manufacturer and Z_i a vector of other variables affecting the profits from integration.

In reality, only the decision to integrate or not is observed, not the profits from integration. In other words, rather than observing I_i^*, we observe:

$$I_i = \quad 1 \quad \text{if} \quad \mu_i > -(\beta' X_i + \gamma' Z_i)$$
$$I_i = \quad 0 \quad \text{otherwise}$$

Here it is assumed that the μ_i are IN$(0, \sigma^2)$, and the relationship is modeled as a standard probit.

The coefficients of the probit regression can be interpreted as measuring how much the probability of integration changes as the hold-up risk and the importance of investments change. The results from the probit model using alternative ways of categorizing multi-product firms are shown in Table 3. The probits reported in the first four columns include the independent variables discussed above. The first column groups multi-product firms by considering the product with the highest rate of fashion change. The second column identifies the product produced with the highest quality materials; the third column limits the sample to the 198 firms for which these two rules produce the same independent variables; and the fourth limits the sample to the 128 firms producing in only one product segment.

The clearest prediction from the two frameworks relates to the speed fashion turnover. The property rights model leads us to expect a negative relationship between fashion turnover and integration, and the transactions cost model a positive relationship. The results favor the property rights model. The variable measuring the speed with which styles change in the manufacturer's product segment has a negative coefficient. It is significant at the 0.10 level when firms are categorized by their product produced with the highest quality of materials (Column 2) and when the sample is limited to firms for which the fashion turnover and quality of materials produce the same set of independent variables (Column 3). Fashion turnover has an important impact on integration. Holding other variables constant at their means and using the coefficient from Column 2, a one-standard deviation increase in the rate of fashion turnover (about 0.6 turns per

Table 3
Probit results for integration into retailing

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−0.35**	0.36**	−0.32**	−0.31**	−0.37**	−0.52**
	(4.53)	(4.69)	(4.14)	(4.23)	(4.31)	(3.34)
Annual fashion change	−0.10	−0.17**	−0.14*	−0.16	−0.12	−0.07
	(1.27)	(2.09)	(1.65)	(1.55)	(1.41)	(0.49)
Women	0.20**	0.21**	0.24**	0.30**	0.25**	0.25*
	(2.56)	(2.65)	(2.91)	(3.15)	(2.28)	(1.77)
Dress	0.09	0.14*	0.13	0.12	0.13	0.08
	(1.15)	(1.72)	(1.51)	(1.14)	(1.28)	(0.56)
Quality of materials	0.11*	0.16**	0.17**	0.12	0.16	0.32**
	(1.80)	(2.44)	(2.56)	(1.55)	(1.61)	(2.78)
Women or dress, high quality material					−0.08	
					(0.62)	
Employees (hundreds)	0.05**	0.04*	0.03*	0.04	0.05**	−0.04
	(2.61	(2.52)	(1.86)	(1.16)	(2.58)	(0.32)
Number of lines	0.02	0.03	−0.02		0.02	0.08
	(0.38)	(0.62)	(0.35)		(0.47)	(0.84)
χ^2	9.9*	12.9**	14.5**	12.3**	10.2	12.9**
	(4 d.f.)	(4 d.f.)	(4 d.f.)	(4 d.f.)	(5 d.f.)	(4 d.f.)
No. of Obs.	215	215	198	128	215	57
% Integrated	31.2	31.2	30.5	26.6	31.2	25.9

t values in parentheses. *Significant at 0.10 level; **significant at 0.05 level. (1) Multi-product firms categorized by product with highest fashion turnover; (2) multi-product firms categorized by product with quality materials used; (3) sample limited to firms where rules used in columns 1 and 2 produce same values; (4) sample limited to firms producing in only one product segment; (5) multi-product firms categorized by product with highest fashion turnover; and (6) interview sample only.

year) decreases the probability a firm is integrated by about 10 percentage points, or one-third of the sample mean. The result is consistent with the need to give retailers stronger incentives when their investments are more important, as the property rights framework predicts. Since the standard asset specificity model predicts more integration in the face of greater contractual difficulties, this result is particularly significant in differentiating the two frameworks.

The transactions cost framework suggests that firms producing in more heterogeneous segments, and facing more risk of being held up by retailers, are also more likely to be integrated into retailing. Both WOMEN and DRESS are positively associated with integration, though the former coefficient is more robust to changes in the categorization rule. The reported coefficients for both WOMEN and DRESS represent the impact on integration of a change from 0 to 1 in either variable. In the property rights framework, this result suggests the effect of increasing the specificity of the manufacturer's investment dominates the effect of increasing the importance of the retailer's investment. Finally, manufacturers using higher quality materials in production are more likely to be integrated forward into

retailing, suggesting that the manufacturer effect dominates here as well. The χ^2 reported at the bottom of each column tests for the joint significance of the specificity and importance variables are significant as a group.

The fourth column limits the sample to the 128 firms which produce in only one product segment. While the coefficients from this regression have a magnitude which is generally similar to those reported in the preceding columns, they are less precisely measured. Only WOMEN is significant at the 0.10 level, with the quality of materials and fashion change slipping below the 0.10 level of significance. While somewhat disappointing, the lack of significance is not surprising given the smaller sample size.

The discussion of the property rights framework in Section 2 above suggests that the interaction between specificity and importance should also be significant. The probit reported in Column 5 repeats that in Column 1 with the addition of an interactive variable indicating manufacturers using high quality materials and producing either women or dress shoes (or both). The variable is the wrong sign and not statistically significant. Alternative measures of interactive effects produce similarly insignificant results.[23]

4.5. Sample selection

The majority of the sample comes from interviews conducted at a 'shoe fair' in the city of Leon in May 1993. Since it is probable that those choosing to attend the fair (27% of all members of the chamber) do not represent a random sample of firms in the industry, there is a potential sample selection problem. Indeed, the data in Table A.1 of Appendix A suggest that sample firms are larger and produce higher quality goods than the average member of the chamber. One way to control for the effects of sample selection is to use only those observations which come from the interview sample. Since these firms come from a sample of 100 firms drawn randomly from a list of all firms who are members of the industry association, there is less reason to be concerned with selection bias in this sub-sample. The results of the preceding specification run over only the 57 observations from direct interviews are shown in the last column of Table 3. The measure of investment importance and one of the heterogeneity measures (WOMEN) remain positive and statistically significant. DRESS and fashion

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[23] An interaction between the rate of style change and product heterogeneity might also be expected. Where fashions change quickly, manufacturers will be forced to dump returned merchandise on the wholesale market regardless of the number of styles. Hence, heterogeneity might have an effect only in segments with a low rate of fashion change. However, no significant interaction effect is found in the data.

change are both the expected sign but statistically insignificant when the regression is run on only the interview sample.[24]

5. Discussion and conclusion

The transactions cost and property rights frameworks are differentiated by the predicted effect of increased fashion turnover on integration. Driven by an increase in the absolute level of specificity in the relationship, transactions cost predicts an increase in integration as fashion turnover increases. Driven by a change in the relative specificity and importance of marginal investments made by manufacturing and retailing managers, property rights predicts less integration as fashion turnover increases. Overall, the data provide support for the property rights framework: independent ownership is more likely in segments with high fashion turnover. While the negative relationship between fashion turnover is and integration is consistently negative, the finding is statistically significant only in some of the specifications. The negative association is not significant, for example, in a randomly selected subsample. The other empirical findings-increased integration among producers of heterogeneous goods and goods using higher quality materials — are consistent with either framework. These findings suggest it is important to consider how the costs of integration vary in the data. Previous empirical work in transactions cost has focused exclusively on variation in the benefits of integration.

The importance of the retailer's investment in high fashion segments of the industry drives the results. This depends upon the particular characteristics of the industry — a very large number of manufacturers, most of small size (fewer than 100 workers), and an even larger number of mostly independently owned retail stores. This structure is quite different from the footwear industry in the United States, for example, which is characterized by a much smaller number of large manufacturers. In the US market, where the manufacturer's brand name is much better known, the retailer's investment in building a client base is likely to be less important. Nevertheless, the conclusion that retailers need stronger incentives in situations where their investments are more important may apply to other

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[24] An alternative approach is to endogenize the sample selection. Recall that the dependent variable was obtained for all firms attending the shoe fair in Leon. We can correct for selection into the sample (attendance at the fair) by using a censored probit with 'partial partial observability' (Meng and Schmidt, 1985), using data on the characteristics of all of the members of the chamber. One difficulty is that the data do not include variables which are obvious candidates for identifying the selection model. Results are available from the author. All of the coefficients retain their signs, but only WOMEN is significant at the 0.10 level. The selection model is identified by using a proxy for the age of the firm (the firm's chamber registration number).

industries, such as art galleries or high end restaurants. Where investments in building a client base are important, both vertical and horizontal integration should be less frequent. Brickley et al. (2000) provide some additional support for this conclusion, showing that the importance of local knowledge is an important determinant of bank branch ownership in Texas.

There are, of course, many alternative explanations for integration. One alternative rationale for integration is examined in Shepard (1993), who looks at vertical integration in the gasoline market under the assumption that firms integrate to avoid double markup pricing. From this perspective, differences in demand elasticities across segments could generate a pattern of integration incentives. No measures of demand elasticities in the various segments are available. Greater heterogeneity might well imply less substitutability between goods (and lower elasticities) in women and dress segments, which might produce the higher integration found in those segments. However, differentiation across time, measured by fashion turnover, should also result in lower demand elasticities and an incentive to integrate. The data here suggest the opposite.

Agency theory provides another explanation.[25] The agency literature views ownership as the right to the residual profit stream from an asset, and generates integration from the need to provide profit incentives. Grossman and Hart assumes away agency considerations with a claim that integration does not make available any new contracts. An integrated manufacturer can pay his retail manager the profit stream of the retail store without selling the store to her. If in practice profit streams and asset ownership are correlated, then it may be that the integration measure here is proxying for lower powered incentives for the retailer. But for agency theory to explain the patterns in the data, monitoring the retailer would have to be easier in the heterogeneous segments than in the homogeneous segments. This seems unlikely, though no direct evidence is available.

The industry demonstrates that the property rights framework can lead to patterns of integration different from those identified by the transactions cost framework, especially as the latter has been developed in the empirical literature. The exercise also demonstrates the difficulty in matching the specific components of the property rights model to a real world setting. Detailed information about the structure of trade in an industry is required. Some part of the required information must be gathered in a qualitative manner, making replication more difficult. Nevertheless, the attention which the Grossman/Hart and Hart/Moore papers have received, further empirical evidence, such as that provided by Baker and Hubbard (2000), is needed.

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[25] See Tirole (1988) for a review.

Appendix A. Description of data and interviews

Data used in the paper come from three different sources. First, all manufacturers in Mexico are legally required to belong to a chamber of industry. The Shoe Industry Chamber for the State of Guanajuato[26] has more than 700 manufacturer-members. Data for the year 1992 were obtained from this chamber for the 700 manufacturers. These data include the types of products produced and the materials used in construction, but do not include information on whether the manufacturers are integrated forward into retailing.

Information on integration was obtained from two sets of interviews with the manufacturers. A total of 60 extensive interviews was conducted at factories in the state of Guanajuato in early 1993. These firms were selected in the following manner. A random sample of 100 firms with more than 15 employees was drawn. Interviews were arranged with 50 of these firms. Some of the remaining 50 had ceased operations and a few declined to participate. The majority (40 or so) were not interviewed for lack of time. The other 10 extensive interviews came from a sample of all of the small firms which are chamber members in one neighborhood (Coecillo) in the city of Leon. Additionally, short interviews were conducted with essentially all of the manufacturers based in the state of Guanajuato who attended the shoe fair in the city of Leon in May 1993.

All of the independent variables used in the probits are derived from information obtained from the industry chamber. The independent variable comes from the two sets of interviews. A total of 215 usable observations was obtained, representing 30% of the membership of the chamber. The only data from the interviews used in the analysis is whether the manufacturers are integrated into retailing.

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[26] Cámara de la Indústria del Calzado del Estado de Guanajuato. The industry in Guadalajara is the Cámara de la Indústria del Calzado del Estado de Jalisco.

Table A.1
Comparison of sample with all members of industry association (standard deviations in parentheses)

Characteristic	All chamber		
	Members	Sample	Interview
Total employment	52.9	109.5	58.3
	(116.0)	(182.7)	(78.6)
Quality category (proposition high quality materials)	0.450	0.549	0.450
	(0.50)	(0.50)	(0.50)
Prop. producing women	0.405	0.433	0.400
	(0.49)	(0.50)	(0.49)
Prop. producing dress	0.234	0.344	0.267
	(0.42)	(0.48)	(0.45)
Number of lines produced	1.32	1.53	1.45
	(0.61)	(0.73)	(0.72)
Average fashion turnover/year	0.65	0.72	0.63
	(0.54)	(0.58)	(0.51)
Prop. hi qual/women and dress	0.67	0.126	0.083
	(0.25)	(0.33)	(0.28)
Prop. hi qual/women only	0.116	0.102	0.100
	(0.32)	(0.30)	(0.30)
Prop. hi qual/dress only	0.071	0.130	0.133
	(0.26)	(0.34)	(0.34)
Prop. hi qual/no women, no dress	0.196	0.191	0.133
	(0.40)	(0.39)	(0.34)
Prop. low qual/women and dress	0.054	0.047	0.033
	(0.23)	(0.21)	(0.18)
Prop. low qual/women only	0.168	0.158	0.183
	(0.37)	(0.37)	(0.39)
Prop. low qual/dress only	0.042	0.042	0.017
	(0.20)	(0.20)	(0.13)
Prop. low Qual/no women, no dress	0.286	0.205	0.317
	(0.45)	(0.40)	(0.46)

Firms reporting all necessary information, $N_{ALL}=689$, $N_{SAMP}=215$ and $N_{INT}=60$. Multi-product firms are classified by the product with the highest hold-up risk in this table.

Table A.1 compares the characteristics of firms in the sample with characteristics of all members of the chamber. The 60 firms in the interview sample have average characteristics very similar to the entire industry association membership. The characteristics of the firms in the sample of 215 firms for which all the necessary data are available appear to be somewhat different than the overall association membership. The sample firms are larger, more likely to use high quality materials in production and somewhat more likely to be producers of dress shoes. Sample selection bias is discussed in the paper.

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