INTERFIRM RELATIONSHIPS AND INFORMAL CREDIT IN VIETNAM*

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Trading relations in Vietnam's emerging private sector are shaped by two market frictions: the difficulty of locating trading partners and the absence of legal enforcement of contracts. Examining relational contracting, we find that a firm trusts its customer enough to offer credit when the customer finds it hard to locate an alternative supplier. A longer duration of trading relationship is associated with larger credit, as is prior information gathering. Customers identified through business networks receive more credit. These network effects are enduring, suggesting that networks are used to sanction defaulting customers.

I. INTRODUCTION

Firms routinely rely on other firms' goodwill. Where a well-functioning legal system exists, in advanced economies, ongoing relationships complement formal contracts in helping deals work smoothly [Macaulay 1963; Haley 1997]. Where laws of contract are inadequate, in many developing and transition countries, informal relationships can substitute for the courts in allowing deals to be made [Greif 1997; McMillan 1997]. Ongoing or clientelistic relationships have long been studied by sociologists, anthropologists, and economic historians.[1] They have been little studied econometrically, however, because data are hard to come by and because the dependent variable, the success of the relationship, can be hard to measure.

A survey of private firms in Vietnam is used in this paper to examine relational contracting. The survey gives data on a firm's relationships with specific customers and suppliers. Taking as our

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1. Geertz [1978] defines clientelization as the tendency "for repetitive purchasers of particular goods and services to establish continuing relationships with particular purveyors of them rather than search widely through the market at each occasion of need." Ongoing relationships in various settings have been studied by Barton [1983], Greif [1993, 1994], Milgrom, North, and Weingast [1990], and Podolny and Page [1998].

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measure of a firm's trust in its customer the amount of trade credit it grants, we ask what the determinants of business trust are.

Our main findings are that trade credit tends to be offered when (a) it is difficult for the customer to find an alternative supplier; (b) the supplier has information about the customer's reliability through either prior investigation or experience in dealing with it; and (c) the supplier belongs to a network of similar firms, this business network providing both information about customers' reliability and a means of sanctioning customers who renege on deals. Social networks, based on family ties, also support relational contracting, although the evidence for their efficacy is weaker than for business networks.

II. Relational Contracting

Our aim is to test some hypotheses about relational contracting. What determines the level of business trust? A supplier agreeing to accept payment after delivery of the goods must somehow ensure that its customer abides by the agreement. In the absence of a formal legal system to enforce contracts, repayment must be enforced informally. Informal enforcement often takes the form of repeated, ongoing relations; the supplier trusts the customer because it knows the customer has an incentive to repay in order to maintain its relationship with the supplier.

Vietnam provides a stringent test of the workability of relational contracting, for Vietnamese private firms do not yet have a formal legal system to fall back on. The development of formal institutions to support a market economy failed to keep pace with the growth of the private sector via the entry of new firms that started with the reforms of the mid-1980s. When our surveyed managers were asked whether the courts could enforce a contract with a customer, 91 percent said they could not.[2]

We take as our measure of trust the fraction of the payment made after delivery of the goods; this is our dependent variable. In what circumstances does the ongoing nature of a relationship

2. Some legal reforms have been enacted: constitutional reform established the protection of private property in 1992, and legislation establishing business courts was passed in 1994 [Gillespie 1993; Pham Van Thuyet 1996]. But by the time of our survey, 1995–1997, the courts evidently were still not accessible to firms. Vietnam's situation is worse than even the former Soviet Union's: in a 1997 survey asking the same question, 55 percent of Ukrainian firms and 58 percent of Russian firms said the courts could enforce contracts [Johnson, McMillan, and Woodruff 1999].

assure the supplier that the customer will repay a debt? The independent variables, suggested by repeated-game theory, represent the customer's ability to find alternative trading partners, the supplier's gathering of information about the customer, and network relationships.[3]

The customer's ability to buy from alternative suppliers might affect the level of trust and thereby determine the amount of trade credit granted. The customer could be locked into the relationship, either because it would have high costs of search for another supplier or it would incur large transport costs in buying from another supplier. If the customer is locked in, the supplier can threaten to cut off further trade if the debt is not repaid. Firms that find it difficult to locate alternative trading partners will invest in maintaining their existing relationships [Kranton 1996; Ramey and Watson 1996]. One of the managers, for example, explained he has a trouble-free relationship with his customers because "the product is specialized and not available in the market so both the enterprise and its customers have to depend on each other." Lock-in helps make relational contracts workable. Our first hypothesis, then, is that *customers lacking alternative suppliers will receive more trade credit*.

Firms' characteristics might be difficult for other firms to observe; firms have different types [Wilson 1985]. A customer might or might not be dependable in paying its bills. The supplier's direct dealings with the customer might yield information about its creditworthiness. First, the supplier might visit the customer's plant or store before any sale is made. One manager we interviewed said he visits his customers to investigate their "financial capability and personality." Another said the amount of credit he allows depends on the reliability of the customer, evaluated by visiting his shop. Visits might provide information about the customer's work habits and business acumen. They might also reveal the customer's investment in plant and equipment: large sunk investments could serve as a signal of the customer's reliability [Carmichael and MacLeod 1997]. Second, cooperation might build up gradually, as the supplier learns through trading about the customer's reliability. Some customers might have long time-horizons while others are fly-by-night firms. By steadily increasing the amount of trade credit it offers, the

3. Anecdotal evidence on how the firms gather information and how they maintain agreements, based on interviews with the managers we conducted along with the survey, is given in McMillan and Woodruff [1999].

supplier can induce any firms that are unreliable to break the relationship early and thereby can sort one type of firm from the other [Ghosh and Ray 1996; Watson 1995]. The frequency with which a manufacturer visits the customer during the trading relationship may indicate the intensity of information gathering. Our second hypothesis, then, is that *there will be more trade credit (a) when the supplier inspects the customer directly and (b) in relationships of longer duration.*

Our third hypothesis is that *a supplier belonging to a network will grant more trade credit.* This could be for either of two distinct, though not mutually exclusive, reasons. First, a network might provide information. A firm might learn about the reliability of a customer not only through directly dealing with it but also by asking other manufacturers or family members before the trading relationship begins. (We shall refer to the first of these information sources as a business network and the second as a social network.) Second, networks provide not only information about customers' reliability but also extra ability to sanction customers who renege. The threat of no further trade if debts are not paid gains extra force if it comes not just from the firm owed the money but also from other firms in the same line of business [Kandori 1992]. Gossip among the firms permits sharing information on customers' behavior in order to implement such community sanctions. Social networks also provide the possibility of enacting community sanctions. Community sanctions therefore give a basis for trade credit.

The two versions of the third hypothesis, information and sanctions, can be distinguished empirically. Since a firm also learns about its customer's reliability through its direct dealings with it, the initial informational role of networks should dissipate over time. If community sanctions are important in eliciting cooperation, on the other hand, the effect of networks will be enduring.[4]

4. Greif [1993, p. 532] uses historical documents to argue that the eleventh-century Maghribi traders network offered sanctioning of traders who cheated, but its purpose was not to provide information about traders' reliability. The cross-country networks of ethnic-Chinese traders investigated by Trindade and Rauch [1997], on the other hand, appear to perform an information-provision role but not a sanctioning role, in that the Chinese networks have more impact on trade in differentiated products than in homogeneous products. Information matters with differentiated products because of matching considerations, whereas if networks were used for sanctioning purposes their effect should be the same for homogeneous and differentiated products.

III. Other Theories of Trade Credit

Although our aim is to test the theory of relational contracting, our regressions will also include some variables suggested by various theories of trade credit in the finance literature. These theories focus on developed countries with functioning legal systems and do not consider relational contracting. Nevertheless, the determinants of trade credit that they identify might apply in Vietnam. We take these as subsidiary hypotheses to the main hypotheses listed above about relational contracting. Including these variables also serves to check the robustness of the main hypotheses. There are two sets of explanations of why firms offer credit to their customers rather than leaving financing to specialists like banks.

One set of explanations is based on industrial organization. If the banking sector is imperfectly competitive, firms can use trade credit to avoid paying monopoly rents to the banks [Emery 1987]. On the other hand, trade credit might be needed when the banking sector is too competitive to allow ongoing relationships in which the banks lose money early in a relationship and earn profits later [Petersen and Rajan 1995]. The market power of the firms also is relevant: a firm might offer trade credit to price-discriminate covertly, to evade legal sanctions, or to hide price cuts from other customers [Brennan, Maksimovic, and Zechner 1988]. Trade credit can further serve as a warranty for product quality, since the delay in payment gives customers time to inspect the merchandise [Long, Malitz, and Ravid 1993].

Another set of explanations rests on the advantages firms have over banks in selecting, monitoring, and enforcing credit contracts. Information available as a by-product of day-to-day trading may allow the firms to see which customers are better credit risks. If the customer has no access to bank loans, because of the adverse-selection problem, the seller might have to grant credit in order to make the sale. Firms will therefore receive more trade credit when they are receiving less bank credit [Biais and Gollier 1997]. Finally, if a loan is not repaid, a manufacturer might be better equipped than a bank to resell repossessed merchandise [Mian and Smith 1992].

IV. The Survey

Prior to the mid-1980s, essentially all economic activity in Vietnam was undertaken by state firms or collectives whose

production was regulated by state plans. The market was replaced by central planning after 1954 in the north (Hanoi) and 1975 in the south (Ho Chi Minh City). The transition back to a market economy began in the early 1980s, and gathered momentum with a series of reforms undertaken in 1986 (*doi moi*). The 1986 reforms led to a resurgence of private sector activity. By 1993 privately owned firms outnumbered state firms over three to one (19,762 to 6,019). They produced, according to official estimates, 29 percent of industrial output nationwide, concentrated in light industry.[5]

Our data come from surveys of 259 nonstate firms in Hanoi in 1995–1996 and in Ho Chi Minh City in 1997. The surveyed firms were drawn from lists of members of the Vietnam Chamber of Commerce and Industry (VCCI). The sample probably does not represent the Vietnamese manufacturing sector as a whole, as firms that join the VCCI are likely to be more successful than average. The data are summarized in Table I. The median firm has 32 employees, with two firms reporting four and two reporting more than 300. Our sample reflects the recent resurgence of the private sector. Most of the firms are new, with 60 percent having started less than four years before the survey was administered. But 20 percent—mostly in Hanoi—began operating before 1986 as collectives in the planned economy; half of those were still collectives at the time of the survey.[6] All are manufacturers, with roughly 17 percent producing garments or footwear, 10 percent in each of the categories of metal products, wood products, food, construction materials, and paper/packaging, and the remainder from diverse industries. Metal and food-products companies typically have 50 or fewer workers and garment and footwear companies more than 50. Most firms are owner-managed, with two-thirds being more than half-owned by the top manager and his family, and 40 percent having no owners outside the family. Fourteen percent are collectively owned. The primary source of start-up capital was the entrepreneur's own savings, although 47 percent of firms report some contribution to start-up capital from nonfamily partners and 10 percent report start-up loans from banks. Bank credit is received by 22 percent of the firms, but trade

5. For background on Vietnam's reforms, see Fforde and de Vylder [1996] and World Bank [1995].

6. These firms are included in the regressions reported below. However, the results are not changed much when either collectives, firms older than ten years, or both of these groups are excluded.

TABLE I
SUMMARY OF SURVEY DATA

Category	All firms	≤50 Employees	>50 Employees
Number of firms	259	186	73
Hanoi	149	108	41
Ho Chi Minh City	110	78	32
Number of employees			
Median	32	25	94
Mean	52	25	122
Standard deviation	60	14	75
Age			
1–4 years	60%	60%	60%
5–10 years	20%	19%	23%
>10 years	19%	20%	16%
Industries:			
Metal	12%	15%	5%
Wood products	12%	12%	14%
Food	10%	11%	7%
Garments and footwear	17%	13%	29%
% of sales to private firms:	73%	71%	77%
% of sales to customers located:			
Within same city	56%	63%	40%
Outside city, in Vietnam	23%	24%	23%
Exports	20%	13%	37%
% of supplies from private firms:	68%	71%	60%
% of supplies from suppliers located:			
Within same city	54%	58%	44%
Outside city, in Vietnam	32%	30%	38%
Exports	14%	12%	18%
Ownership—% of firms			
100% family-owned	40%	43%	33%
Have outside owners	43%	40%	49%
Collectively owned	14%	15%	14%
Start-up finance—% of firms			
100% family-financed	41%	43%	34%
Some finance from partners	47%	46%	52%
With bank loan at start-up	10%	9%	14%
% of firms with current bank loan:	22%	17%	37%

credit is much more common, with 57 percent of ongoing customer relationships and 53 percent of ongoing supplier relationships involving trade credit.

While all the respondents are nonstate firms, state-owned enterprises account for some of their sales and supplies, although most—nearly three-quarters of sales and two-thirds of supplies—

involve nonstate customers and suppliers. We consider only relationships between the respondent firms and nonstate trading partners.[7]

Most sales go to customers in the same city as the respondent. This is not the case for large firms, however, which export more than a third of their production on average. Although exports account for 20 percent of production, 73 percent of firms export nothing. Nine percent (24 firms) export all of their production. Two-thirds of the exporters are in the wood products, garment, and footwear industries. Firms that export some of their output are more likely to have started within four years of the survey (82 percent versus 52 percent, $t = 4.49$). Exporters also import a larger portion of their supplies (24 percent versus 10 percent, $t = 3.25$), with a small number (seven) importing all of their supplies and exporting all of their output; these are probably subcontractors for foreign firms, although the survey provides no further detail on this.

The heart of the survey is a series of questions about the firm's relationships with its first customer and its most recently added customer; and with it longest running supply relationship and its newest supply relationship. These questions provide us with a sample of individual trading relationships and give a further indication of the level of market development in Vietnam. The median percentage of a manufacturer's total sales going to each private sector customer identified in the survey is 30 percent. The goods exchanged are not usually specific to a buyer. In three-quarters of the relationships the manufacturers produce the same good for other customers; in almost 90 percent of the cases, manufacturers say their suppliers have other buyers for the same good. Manufacturers produce goods to fill specific orders in less than half the relationships (46 percent of customer orders and 11 percent of supply orders), with the remainder producing to maintain inventories. These data suggest that most of the trading relationships are not complex.

For each of the four specific relationships, firms were asked what proportion of the sales price is paid in advance of delivery, at the time of delivery, and after delivery. In open-ended interviews accompanying the survey, several firms said that it is common practice to pay for one order when the next order is delivered.

7. The data indicate that relationships with state-owned enterprises have a different character. Differences between private and state-owned trading partners are left to future research.

Others said a typical credit term is a month, with no explicit interest charged. Since any buyer offered such a schedule would find delaying payment to be optimal, we interpret the portion of the bill paid after delivery as a measure of credit supply. Observed trade credit is the outcome of the supply of credit offered to the customer and the customer's demand for credit. We focus on supply, but most of our results would be unaffected if the equations were interpreted as reduced-form mixtures of supply and demand factors. Firms receiving bank loans might be given more credit by suppliers either because the bank loan is a signal of creditworthiness (a supply factor) or because they have a greater need for credit (a demand factor). But a customer's demand for credit should not be affected by the amount of knowledge his supplier has about him or the availability of alternative suppliers.

The survey contains information on 518 manufacturer-customer relationships and 518 manufacturer-supplier relationships. Forty-six percent of the suppliers and 40 percent of the customers are state-owned enterprises. Eliminating these and relationships no longer ongoing leaves a sample of 242 customer relationships and 254 supplier relationships. Complete data are available for 224 customer and 243 supplier relationships.[8]

V. Empirical Measures

In the next section we examine the determinants of the surveyed firms' willingness to offer credit to their customers. We run regressions with the dependent variable being the proportion of the payment made after delivery of the goods. We use three sets of independent variables suggested by the theory (as well as a set of control variables suggested by the trade-credit literature, as discussed above). The means of the dependent and independent variables are shown in Table II.

The first set of variables represents the ease with which a customer can find an alternative supplier. The prediction is that, when a customer can find an alternative supplier more easily, it will receive less trade credit. We proxy this with two variables. First, the survey asked how many other producers of similar products were located within one kilometer of the respondent firm. Almost two-thirds of the firms indicated there was at least

8. The relationships do not represent a random sample of all the firms' trading partners. The longest running relationships, in particular, are almost certainly more successful than average relationships.

TABLE II
CUSTOMER CREDIT VARIABLE MEANS

	All firms	Domestic customers	Export customers	≤50 Employees	>50 Employees
Number of observations	224	153	71	148	76
Avg. % of bill paid after delivery	38%	39%	37%	35%	44%
% firms w/no payment after	47%	44%	54%	49%	43%
% firms w/all paid after	21%	20%	23%	20%	22%
# similar manufacturers located w/in 1 km	3.4	3.3	3.8	3.6	3.1
Most important competitor w/in 1 km	33%	33%	32%	38%	22%
Duration of relationship (years)	2.13	2.18	2.02	2.1	2.26
Visited customer before first transaction	46%	47%	42%	44%	49%
Currently visit with customer at least weekly	23%	29%	10%	29%	12%
First information from other manufacturers	20%	18%	25%	19%	22%
Manager talks to other suppliers of customer at least monthly	12%	11%	13%	9%	16%
First information from family members	17%	19%	14%	19%	14%
Manufacturer sets prices by relationship w/cust	45%	40%	56%	41%	47%
Customer is retail store/ wholesaler	42%	46%	32%	44%	45%
Log age of manufacturer + 1 (years)	1.61	1.68	1.48	1.62	1.61
Log size of manufacturer (# of employees)	3.54	3.28	4.11	2.96	4.68
Firm receives credit from bank	21%	17%	31%	18%	38%
Avg. % of bills paid to two identified suppliers after delivery	40%	40%	41%	39%	42%
Customer is foreign-owned	32%	0%	100%	20%	54%
% of manufacturer's sales from largest product	85%	84%	88%	88%	81%
Manager speaks Chinese	32%	30%	35%	29%	37%
Customer is firm's first customer	41%	39%	45%	41%	42%
Manufacturer located in Hanoi	34%	31%	42%	32%	39%

one similar manufacturer nearby, and 38 percent said there were three or more such firms. Second, the survey asked where the respondent firm's most important competitor was located; one-third said their main rival was in the same neighborhood. More manufacturers of similar goods nearby or an important competitor located in the same neighborhood lower the customer's costs of finding and using an alternative supplier.

The second set of independent variables measures the information the manufacturer gathers directly about its customer through its direct contact with the customer. The prediction is that better information means more credit. One source of information about the customer's reliability is direct experience in trading with the customer. We measure this by the duration of the trading relationship. However, many of the interfirm relationships in our data are new: 42 percent have lasted a year or less. Thus, experience in dealing with the customer provides little information for many of the firms, and other sources of information become relevant. Visits to the customer's factory or store might provide information about the level of the customer's reliability. Forty-six percent of our respondents said they visited the customer's facility at least once before the business relationship started. Also, we asked the manufacturers how frequently they visit with the identified customers currently. In 23 percent of the relationships the manufacturers said they visit at least weekly.[9]

The third set of independent variables represents membership in business or social networks. As discussed above, these variables might capture either or both of (a) information about the customer's reliability and (b) the possibility of using community sanctions against the customer. The prediction is that, for either of these reasons, more credit is granted when the firm belongs to a network. First, managers were asked how they first learned about the customer before beginning trade with it. The categories, with the percentage of firms indicating the given response in parentheses, were no information (21 percent), other similar producers (11 percent), other suppliers (10 percent), business associations (4 percent), government (2 percent), own research (51 percent), former employer (2 percent), family (17 percent), and other (11 percent). (The responses sum to more than 100 percent because many firms indicated more than one information source.) We use

9. This response indicates either a visit by the respondent to the customer's facility or a visit by the customer to the respondent's factory.

these responses to create variables indicating information obtained from social or business networks. "Other similar producers," "other suppliers," and "business associations" are combined as business networks, and "family" indicates family networks. Second, the survey also asks whether the customer was managed by a family member or friend at the time of the first transaction. This is a broader measure of social networks, including friends as well as family. It is also arguably a stronger measure, in that the family member or friend manages the customer rather than just providing information about the customer. Third, the respondents were asked how frequently they talk to other suppliers of the particular customer. Talking to other suppliers not only potentially generates information about the customer's reliability, but also allows stronger sanctions against any customer that fails to pay its debts: the punishment for failure to pay might bring a blacklisting from the other manufacturers. Twelve percent of manufacturers talk with other suppliers of the customer at least monthly.

The network variables, as noted, could represent either the information about the reliability of trading partners that the firm could get by talking with other manufacturers or the ability to damage the reputation of a customer that fails to pay its debt. Is it possible to separate information from sanctions? Information about the reliability of a customer is most valuable at the beginning of a relationship. The ability to sanction a trading partner has more enduring effects. Thus, where the information component is important, the effects of business and social networks should diminish as trading relationships age; where sanctions are important, the network effects should endure. We shall test this by interacting the three network variables—information from manufacturers, information from family, and talking with suppliers—with the duration of the relationship.

Table III summarizes the predicted signs of the effects of these three sets of variables on the amount of trade credit granted.

VI. Credit to Customers

In this section we examine the determinants of the surveyed firms' willingness to offer credit to their customers. An average of 38 percent of the goods are paid for after delivery. But in 47 percent of the cases, no portion of the amount due is paid after delivery; in 21 percent the entire bill is paid after delivery. The level of credit is treated as a censored variable, with the desired

TABLE III
DETERMINANTS OF TRADE CREDIT

Variable	Predicted sign
Customer lock-in	
Number of similar manufacturers within 1 km	−
Most important competitor within 1 km	−
Manufacturer information	
Duration of relationship	+
Visited customer before first sale	+
Currently visits customer at least weekly	+
Network membership	
First information from other manufacturers	+
First information from family member	+
Talk to other suppliers of customer at least monthly	+

level of credit observed only when it falls between zero and 100 percent. For values below zero, we observe zero; for values above 100 percent, we observe 100 percent. Denoting the desired level of trade credit offered to customer i as TC_i^*,

$$TC_i^* = \beta X_i + \gamma Z_i + \zeta Ind_i + \mu_i,$$

where X_i is a vector of independent variables (as discussed in the previous section), Z_i a vector of variables measuring other factors affecting credit, Ind_i a vector of industry dummies, and $E(\mu_i) = 0$. Given censoring, the observed level of trade credit offered customer i is

$$TC_i = TC_i^* \text{ for } 0 < TC_i^* < 1$$

$$TC_i = 0 \quad \text{for } TC_i^* \leq 0, \text{ and}$$

$$TC_i = 1 \quad \text{for } TC_i^* \geq 0.$$

This is a standard tobit model with two-sided censoring. To aid the economic interpretation of the results, we report in Table IV the marginal effects of a change in the independent variable in the uncensored range.[10]

10. McDonald and Moffit [1980] show that a tobit coefficient can be decomposed into two parts: the marginal effect of the independent variable in the uncensored range plus the change in the probability of being censored. The coefficients on Tables IV, V, VII, and VIII represent the first part of this decomposition. The tobit coefficients can be recovered by dividing the coefficient shown by the percentage of the sample that is uncensored, shown at the bottom of each table.

TABLE IV
CUSTOMER CREDIT TOBITS
PERCENT OF BILL PAID BY CUSTOMER AFTER DELIVERY

	(1)	(2)	(3)	(4)	(5) Domestic	(6) Foreign	(7) Big	(8) Small
Customer lock-in:								
# similar manufacturers w/in 1 km	−0.007 (1.66)	−0.008 (1.86)	−0.011 (2.98)	−0.010 (2.54)	−0.006 (1.35)	−0.018 (2.30)	−0.026 (3.10)	−0.006 (1.38)
Most important competitor w/in 1 km	−0.13 (2.46)	−0.12 (2.18)	−0.11 (2.18)	−0.16 (2.92)	−0.14 (2.41)	−0.01 (0.12)	−0.04 (0.43)	−0.19 (3.12)
Manufacturer information:								
Duration of relationship (years)	0.08 (2.96)	0.07 (2.61)	0.07 (2.51)	0.07 (2.42)	0.04 (1.34)	0.13 (1.34)	0.14 (1.74)	0.06 (1.90)
Duration ^2	−0.005 (2.15)	−0.004 (1.95)	−0.004 (1.74)	−0.004 (1.78)	−0.003 (1.19)	−0.007 (0.55)	−0.020 (1.45)	−0.003 (1.43)
Visited customer before first sale		0.08 (1.63)	0.07 (1.71)	0.06 (1.33)	0.12 (2.32)	0.04 (0.36)	0.03 (0.41)	0.10 (1.87)
Currently visit cust at least weekly		−0.03 (0.46)	−0.06 (1.03)	−0.05 (0.84)	−0.09 (1.43)	0.07 (0.49)	0.06 (0.60)	−0.05 (0.76)
Network membership:								
First information from other manufacturers	0.20 (3.36)	0.16 (2.83)	0.10 (1.99)	0.17 (2.98)	0.06 (1.00)	0.22 (2.05)	0.11 (1.30)	0.00 (0.03)
Talk to other suppliers of customer at least monthly		0.19 (2.36)	0.19 (2.63)	0.18 (2.31)	0.27 (3.18)	0.04 (0.26)	−0.19 (1.31)	0.31 (3.20)
First information from family member	0.04 (0.60)	−0.01 (0.17)	−0.08 (1.34)	−0.13 (2.11)	−0.13 (1.91)	0.02 (0.17)	0.00 (0.01)	−0.15 (2.15)
Alternative explanations:								
Manufacturer sets prices by relationship w/customer			0.02 (0.53)	0.08 (1.69)	0.06 (1.13)	−0.05 (0.48)	0.14 (1.62)	0.00 (0.03)
Customer is retail store/wholesaler			0.07 (1.62)	0.03 (0.60)	0.11 (2.25)	0.02 (0.20)	0.20 (2.11)	0.03 (0.57)
Log firm age + 1 (years)			−0.09 (1.76)	−0.10 (1.57)	−0.11 (1.91)	−0.25 (1.62)	0.01 (0.04)	−0.06 (1.04)
Log employment			−0.02 (0.98)	−0.06 (2.28)	−0.04 (1.50)	0.05 (1.15)	−0.10 (0.95)	−0.07 (1.86)
Manufacturer receives credit from bank			−0.02 (0.36)	−0.03 (0.53)	−0.01 (0.10)	0.05 (0.55)	−0.04 (0.45)	0.15 (2.02)
% of bill paid to suppliers after delivery (0–2)			0.40 (6.27)	0.47 (6.23)	0.40 (5.45)	0.13 (1.08)	0.35 (2.74)	0.39 (5.25)
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager controls	No	No	No	Yes	No	No	No	No
Number of observations	224	224	224	204	153	71	76	148
% obs not censored	31.70%	31.70%	31.70%	31.37%	35.95%	22.54%	34.21%	30.41%
χ^2	73.5	82.6	134.5	152.0	114.7	48.7	64.1	112.5
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001

Regression are two-tailed Tobits. Coefficients are marginal effects, t-values are in parentheses.

a. All regressions include industry dummies (8), and indicators of first customer and location in Hanoi.

b. Regression 4 also includes % sales represented by main product, manager speaks Chinese, % sales to SOEs, % supplies from SOEs, 100% family-owned, collective, manager formerly worked for SOE, age of manager, and manager attended university.

The regression reported in the first column of Table IV uses only the independent variables related to relational contracting. The remaining regressions in Table IV check the robustness of these results, by adding variables suggested by the trade-credit literature as well as controls related to manufacturer and manager characteristics. All of the regressions include dummy variables controlling for (a) the firm's industry, (b) whether the customer is the oldest or the most recent of the firm's ongoing customers, and (c) the respondent's location (Hanoi or Ho Chi Minh City).

A. Basic Regressions

The first set of variables represents the ease with which a customer can find an alternative supplier. The prediction is that, when a customer can find an alternative supplier more easily, less trade credit will be granted. As discussed above, we proxy this with two variables: the number of other producers of similar products located within one kilometer of the respondent firm, and where the respondent firm's most important competitor was located. The tobits indicate that each additional nearby manufacturer results in almost 1 percent less of the bill being paid after delivery ($\beta = -0.007$, $t = 1.66$). Where the main competitor is nearby, the portion of the bill paid after delivery falls by thirteen percentage points ($t = 2.46$). Thus, customers who can more easily locate an alternative supplier to the surveyed firm do receive less credit.[11]

The second set of independent variables measures the quality of information our manufacturers have directly about their customers. The prediction is that better information means more credit. We find that a longer duration of a trading relationship is significantly associated with larger credit, at a rate that diminishes with time. The level of credit increases by 7 percent in the first year of a trading relationship. After a duration of two years (the mean duration), the amount of credit offered is fourteen percentage points higher than new relationships.[12] A likelihood-

11. A more direct measure of the customer's alternative comes from asking the manufacturers for their estimate of how long it would take the customer to find an alternative supplier. This variable is available for a subset of the sample, 195 of the observations. Customers taking longer than a week to find a new supplier are more likely to get credit. In unreported regressions available from the authors, the variable is significant at the .10 level.

12. All but two relationships have durations of seven years or less. The two exceptions have durations of 15 and 23 years. While we have no reason to exclude these observations, they do have a large effect on the estimated tenure effects. If

ratio test shows that the duration variables are jointly significant ($\chi^2 = 11.54$, p-value $= .01$).

The third set of independent variables represents business and social networks. Business networks appear to support trade credit. Where first information about the customer comes from other manufacturers, twenty percentage points more of the bill is paid after delivery; this is statistically significant at the 1 percent level in the regression reported in column (1). We find no significant relationship, however, between getting information from family members and granting credit ($\beta = 0.04$, $t = 0.60$).[13] This insignificant interaction is robust to the broader measure of social networks, including friends as well as family, discussed above ($\beta = 0.05$, $t = 0.69$, results not shown on table).

We next consider three variables measuring explicit efforts to gather information about a customer. We excluded these variables from the first regression because such efforts may be endogenous to the credit decision. Manufacturers providing credit to a customer have a greater incentive to gather information about that customer. These extra variables cause little change in the significance of the effects discussed above (see column (2)).[14] The first of these variables is the frequency with which the manufacturer talks to other suppliers of the particular customer. The 12 percent of manufacturers who talk with other suppliers of the customer at least monthly grant their customers nineteen percentage points more credit ($t = 2.36$). The second variable is visits to the customer's factory or store before beginning the trading relationship. Visiting the customer's facility before the first transaction is also positively associated with delayed payment, although the effect of prior visits falls below the .10 significance level in column (2) ($\beta = 0.08$, $t = 1.63$). The third such variable is the frequency of

they are excluded from the data, the coefficients on duration and duration squared are 0.13 and −0.016, respectively. Estimated credit during the first two years of the relationship increases from fourteen to twenty percentage points. Exclusion of these two observations has a negligible effect on the other estimated coefficients.

13. Because the categories are not mutually exclusive, there is no base group. However, we ran all of the regressions with dummies for "own research" and "other sources," the latter comprised of "government," "former employer," and "other." The two additional dummy variables had no significant effect on the results. They were excluded from the final specifications to simplify the exposition.

14. Endogeneity is arguably less of a problem for the variables in column (1). The decision to give credit cannot be made before the factory is established and the customer is identified. However, if relationships with higher initial levels of trust have longer duration, then our duration variable may be biased upward. Our data set does not contain any obvious instruments for relationship duration. For a discussion of a comparable problem with job tenure in work relationships, see Altonji and Williams [1997].

visits with the identified customers currently. Ongoing visits have a very small negative association with credit ($\beta = -0.03$, $t = 0.46$).[15]

B. Robustness Checks

The foregoing results are consistent with a story of cooperative relationships sustained by market frictions. The remaining regressions in Table IV examine the robustness of these results. Column (3) adds variables suggested by the literature on trade credit (these are discussed in more detail in Section VIII below). Column (4) adds further controls related to manufacturer and manager characteristics. These additional variables have little effect on the relational-contracting coefficients. Columns (5) to (8) break the sample into domestic and foreign customers and large and small manufacturers; as discussed below, firms with foreign customers show some different patterns in granting credit than firms with domestic customers, and larger firms behave differently from smaller firms.

Manufacturers may be unable to grant trade credit if they are financially constrained. We consider the effect of bank loans and credit from customers. Those who currently receive credit from banks are less likely to be constrained, but we find no effect of the loans on the propensity to grant credit ($\beta = -0.02$, $t = 0.36$). However, receiving credit from suppliers significantly increases the likelihood of offering credit to customers. Our measure of this is the average percentage of bills paid to the two suppliers identified in the survey after delivery of inputs, ranging from zero to one. Firms paying the sample mean of 40 percent of their supply bills after delivery give 16 percent more credit to their customers than firms who pay for none of their supplies after delivery. This proxy for credit from suppliers is clearly imperfect, since we do not know how important these suppliers are beyond that they each represent at least 3 percent of the firm's procurement bill. We suspect that the positive association between receiving credit from suppliers and granting credit to customers is also proxying for differences in credit practices in different product lines.

Given the heterogeneity of the sample, controlling for indus-

15. Frequent visits may simply reflect frequent deliveries of goods. For example, 16 of the 35 firms producing food products (46 percent) visit their customers at least once a week—double the sample mean. This probably reflects the perishable nature of the products, rather than explicit information gathering. Nevertheless, if important information is gathered in the course of delivery, we should expect to find that these manufacturers are more willing to grant credit.

try norms is important. For example, talking with other suppliers of customers might be common among garment producers, where credit also happens to be relatively more common. If so, then the positive coefficient on talking to suppliers may be spurious. We believe that we have adequately controlled for this heterogeneity. First, all of the equations include eight industry dummy variables. (Their coefficients are shown in Appendix 1.) Second, the inclusion of the variable measuring credit from suppliers provides an additional control for the level of credit granted in manufacturer's product line. Third, the correlations between the industry dummies and the relational-contracting variables (shown in Appendix 2) are as big as 0.15 in only 6 of 72 cases. Moreover, in seven of the nine industries, the correlation between the industry dummy and talking to suppliers is opposite in sign to the correlation between the industry dummy and information from manufacturers.

As a further check on the robustness of the results, we added (in column (4)) several firm and manager characteristics, as described in the notes to Table IV. About 10 percent of the sample is lost because of nonresponses to questions related to manager characteristics.[16] In this regression the variable representing information from family members is negative and significant at the .10 level ($\beta = -0.13$, $t = 2.11$).[17] Inclusion of these controls has little effect on the other relational-contracting variables. Among the controls added to column (4), we include a variable indicating whether the manager speaks Chinese to test for ethnic network effects; we found no effect ($\beta = 0.02$, $t = 0.36$, not shown).[18] The fourth regression also tests for effects of membership in trade associations. In 35 percent of the relationships in the sample, the manufacturer belongs to a trade association. The trade associations to which 9 percent of the sample manufacturers belong provide information on the reliability of trading partners or

16. The nonresponses are to questions on education (16), Chinese language ability (7), and work in a state-owned enterprise (2). The changes in the coefficients between columns (3) and (4) do not appear to be the result of the change in sample. When the column (3) specification is run on the reduced column (4) sample, the coefficients are similar to those in column (3).

17. When the alternative measure of social networks, the customer is managed by a family member or friend, replaces information from family members, its coefficient is essentially zero ($\beta = 0.004$, $t = 0.07$).

18. In precommunist Vietnam, according to Barton [1983], interfirm networks were a specifically ethnic-Chinese phenomenon; the ethnic-Vietnamese merchants were unable to establish trust among themselves. The lack of effect of our Chinese-language dummy in the estimation equations to the contrary suggests—though it is not a conclusive test—that the present-day relationships may not be shaped by ethnic ties.

arbitration services. We find no evidence that membership in a trade association providing these services affects the level of credit offered customers ($\beta = 0.02$, $t = 0.29$, not shown).

The relational-contracting variables, therefore, are generally robust to the inclusion of additional controls. Information from family members is the only measure that changes sign or significance, becoming significantly negative in the fourth specification. The estimated marginal effect of other variables changes somewhat with the specification, but fewer similar firms nearby, longer relationship durations, and information from business networks are all consistently associated with higher levels of credit.

Columns (5) through (8) of Table IV examine whether these determinants of the willingness to offer credit vary depending on whether the manufacturing is selling domestically or overseas, or whether the manufacturer is large or small. One-third of the customers in the data are foreign-owned.[19] The determinants of credit in export relationships may differ from those in domestic relationships. Trading companies and other middlemen may play a bigger role in exporting, and subcontracting arrangements may be more common. The fifth and sixth columns split the sample into domestic and foreign customers. The most direct community sanctions—talking to other suppliers of the customer—is important only for domestic customers ($\beta = 0.27$, $t = 3.18$); there is no association between local gossip and giving credit to foreign customers ($\beta = 0.04$, $t = 0.26$). Similarly, visits before the first transaction has a significant effect only for domestic customers. However, foreign trading partners receive 22 percentage points more credit if the initial contact came through manufacturers of similar goods, an effect that is smaller and insignificant when the customer is a domestic firm ($\beta = 0.06$, $t = 1.00$). The measures of the duration of the relationship retain their sign but lose their significance for foreign customers.

Small firms might be expected to rely more than large firms on community sanctions to support credit relationships. Bilateral sanctions are a more powerful threat coming from larger firms. Moreover, larger firms are more likely to have alternative means of enforcing contracts: for example, 12 percent of firms with more than 50 employees and only 5 percent of firms with 50 or fewer employees said there is a third party that can enforce contracts

19. Of the 71 export customers in the sample, 11 are described as being located in the same city as the respondent. These may represent either local buying offices for export customers or local operations of foreign companies.

with their customers ($t = 1.26$). Columns (7) and (8) report tobits for credit given by firms with more than 50 workers and firms with 50 or fewer workers, respectively.[20] For small firms, credit is significantly associated with talking regularly with other suppliers of the customers ($\beta = 0.31$, $t = 3.20$). Although large firms are more likely to talk regularly with other suppliers of their customers (Table II), there is no association between doing so and granting credit for large firms ($\beta = -0.19$, $t = 1.31$). Visiting the customer's facility before the first sale is associated with higher levels of credit among small firms but not large firms. Large firms give twenty percentage points more credit to customers that are retail stores or wholesalers. This suggests that the recovery/resell option may be important for larger firms, since retail stores are less likely to have transformed the merchandise than customers that buy the goods for use as inputs. Finally, large firms give fourteen percentage points more credit in relationships where prices are determined by the "relationship with the customer," this result is consistent with large firms using credit to price-discriminate. The consistent pattern of these results, then, is that large firms tend to follow industrial-organization rationales for granting credit; and small firms rely more heavily than large firms on community-based information and enforcement.

C. Interaction Effects

Network membership provides a manufacturer both information about the reliability of trading partners and the ability to damage the reputation of a customer that fails to pay its debt. We now try to separate information from sanctions, by noting that information about the reliability of a customer is most valuable at the beginning of a relationship, whereas the ability to sanction a trading partner has more enduring effects. We test this by interacting the three network variables—information from manufacturers, information from family, and talking with suppliers—with the duration of the relationship and its square.

The results, shown in Table V, suggest that sanctions are a component of the three network variables. The table shows the estimated cumulative effect of each of the three network variables for the first four years of relationship. More than 90 percent of the relationships in the sample have a duration of four years or less,

20. While there is a positive correlation between being big and having export clients, 42 percent of exporters have 50 or fewer employees, and almost half of the customers of big firms are domestic.

TABLE V
CUSTOMER CREDIT, TIME-DEPENDENT INFORMATION VARIABLES

	Information from manufacturers	Talk monthly with suppliers of customer	Information from family	Visited customer before first sale	Visit customer at least weekly
Information	0.09	0.08	−0.03	0.17	−0.25
	(0.85)	(0.58)	(0.24)	(2.25)	(2.28)
Information * duration	−0.004	0.19	−0.07	−0.08	0.22
	(0.05)	(1.50)	(1.08)	(1.35)	(2.29)
Information * duration squared	0.004	−0.04	0.01	0.01	−0.04
	(0.20)	(1.84)	(1.68)	(0.82)	(2.18)
χ^2 (2 df)	0.25	4.43	3.36	2.52	5.51
p-value	0.88	0.11	0.19	0.28	0.06
Effect of information on credit:					
duration = 1 year	0.08	0.23	−0.08	0.10	−0.07
duration = 2 years	0.09	0.30	−0.12	0.05	0.03
duration = 3 years	0.11	0.28	−0.12	0.01	0.06
duration = 4 years	0.13	0.19	−0.10	0.00	0.01

and 79 percent have durations of three years or less. The effect of getting initial information about the customer from another manufacturer grows slightly over time (from eight percentage points in year 1 to thirteen percentage points in year 4); the effect of talking regularly with suppliers increases in the first two years, and then falls. The effect of getting initial information about the customer from a family member, which is negative from the start, becomes more so initially before rebounding. The χ^2 tests indicate that the additional variables are jointly significant in none of the first three equations, indicating that the time-independent variables adequately explain the data. We interpret these results as indicating that sanctions are a significant role of the business networks.

We also interact the bilateral information variables—visiting with the customer before and during the relationship—with the

relationship duration. Unlike with the network variables, the impact of visits before the first sale does diminish over time. Prior visits is associated with customers paying ten percentage points more of their bill after delivery one year into the relationship, but only one percentage point more after three years. The disappearance of the effect of visits prior to the start of the relationship suggests that these visits provide information rather than an ability to sanction. Note that the variable indicating visits has a higher level of significance when the interaction terms are included (compare Table IV, column (3) with Table V, column (4)). The time-dependent pattern of ongoing visits is more difficult to interpret. The effect of ongoing visits first increases and then decreases, hovering on either side of zero. The time duration-interaction terms are jointly significant in the ongoing-visits equation.

D. Summary of Customer-Credit Results

The data show that a firm offers more trade credit to its customers when there are fewer firms similar to it nearby. If a firm's main competitor is located nearby, the credit the firm grants is about fifteen percentage points lower. The duration of the relationship affects trade credit: after two years, the amount of credit offered is fourteen percentage points higher than with a new relationship. Business networks have a significant effect. Trade credit is ten to twenty percentage points higher for a customer initially contacted through a business network; a firm that communicates with its customer's other suppliers on a continuing basis grants its customers about twenty percentage points more credit. Visits to the customer's factory or store prior to the first transaction are associated with around ten percentage points more credit, the effect being more significant for domestic customers and among small firms. Some of the interactions predicted by the theory are insignificant in the data: visiting the customer on an ongoing basis and belonging to a social network are not significantly related to trade credit.

VII. Credit from Suppliers

A. Basic Regressions

Our survey also contains data on trade credit received by the interviewed manufacturers from their longest continuing supplier and their newest supplier. Trade credit received from suppliers is

similar in magnitude to that granted to customers. The respondents pay an average of 45 percent of their bills after goods are delivered (see Table VI). In the regressions reported in Table VII, we explore how the availability to the manufacturer of alternative suppliers and the information available to the supplier affect the credit the manufacturer receives from the supplier. The theoretical framework used here is the same as in the preceding section. However, we do not have exactly the same data, since our survey was answered by just one of the parties to the relationship: the supplier in the previous section's regressions and the customer is this section's. As a result, the independent variables in Table VII are not the same as those in Table IV. Nevertheless, they are similar enough to provide a further check on the robustness of the customer-credit results.

Data on the manufacturer's degree of lock-in to its supplier are provided by a question on how long it would take them to find alternative supplies in the event a supplier failed to deliver goods as promised. One-quarter of the respondents said it would take

TABLE VI
SUPPLIER CREDIT, VARIABLE MEANS

	All firms	Domestic suppliers	Import suppliers
Number of observations	243	195	47
Avg. % of bill paid after delivery	45%	42%	57%
% of cases w/no payment after	43%	47%	28%
% of cases w/all paid after	30%	29%	36%
<1 day to find alternative supplier	25%	29%	9%
>1 week to find alternative supplier	38%	31%	66%
Currently have no alternative supplier	22%	13%	57%
Duration of relationship (years)	2.58	2.68	2.11
Visited supplier before first purchase	65%	70%	45%
Currently visit w/supplier at least weekly	33%	37%	17%
Manufacturer currently has bank credit	21%	20%	28%
Supplier is managed by family member/friend	21%	23%	13%
If manufacturer cheated supplier, other suppliers find out (0–1–2)	1.22	1.24	1.17
% sales main product	84%	85%	82%
Log age of manufacturer + 1 (years)	1.73	1.78	1.53
Log size of manufacturer (# of employees)	3.37	3.28	3.72
Manager speaks Chinese	24%	22%	32%
Supplier is oldest continuing	49%	48%	55%
Manufacturer is located in Hanoi	42%	49%	10%

TABLE VII
SUPPLIER CREDIT TOBITS
PERCENT OF BILL PAID TO SUPPLIER AFTER DELIVERY

	(1)	(2)	(3)	(4)	(5)	(6) Domestic
Manufacturer lock-in:						
Less than 1 day to find alternative supplier	−0.11	−0.12		−0.11	−0.15	−0.08
	(1.67)	(1.74)		(1.62)	(2.12)	(1.11)
More than 1 week to find alternative supplier	0.004	0.001		−0.002	−0.010	−0.031
	(0.07)	(0.02)		(0.03)	(0.17)	(0.44)
Currently have an alternative supplier			−0.07			
			(1.12)			
Supplier information:						
Duration of relationship (years)	0.03	0.02	0.02	0.03	0.05	0.03
	(1.44)	(0.92)	(0.87)	(1.36)	(1.95)	(1.28)
Duration ^2	−0.0016	−0.0013	−0.0012	−0.0014	−0.0021	−0.0014
	(1.62)	(1.37)	(1.28)	(1.54)	(1.94)	(1.49)
Visited supplier before first purchase		0.07	0.09	0.07	0.03	0.14
		(1.19)	(1.51)	(1.34)	(0.62)	(2.11)
Currently visit supplier at least weekly		−0.003	−0.02	−0.02	−0.01	−0.03
		(0.06)	(0.31)	(0.39)	(0.26)	(0.56)
Manufacturer currently has bank credit	0.26	0.23	0.22	0.24	0.20	0.19
	(3.79)	(3.56)	(3.46)	(3.60)	(2.95)	(2.51)
Network membership:						
Supplier is managed by family or friend	0.11	0.12	0.12	0.10	0.09	0.08
	(1.70)	(1.89)	(1.79)	(1.48)	(1.27)	(1.16)
If manufacturer cheated supplier, other suppliers find out		0.14	0.13	0.13	0.17	0.10
		(3.19)	(3.03)	(3.09)	(3.77)	(2.27)
Alternative explanations:						
% sales main product				−0.39	−0.49	−0.33
				(3.23)	(3.72)	(2.32)
Log firm age + 1 (years)				−0.06	−0.05	−0.06
				(1.13)	(0.75)	(1.01)
Log employment				−0.06	−0.06	−0.07
				(2.12)	(1.96)	(1.95)
Manager characteristics:						
Manager speaks Chinese					−0.06	
					(0.84)	
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Manager controls	No	No	No	No	Yes	No
Number of observations	243	243	243	243	228	195
% obs uncensored	26.34%	26.34%	26.34%	26.34%	27.19%	24.10%
χ^2	45.0	59.6	56.9	76.1	84.5	48.7
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Regressions are two-tailed Tobits. Coefficients are marginal effects, t-values are in parentheses.
a. All regressions include industry dummies (8), and indicators of oldest supplier and location in Hanoi.
b. Regression 5 also includes % sales to SOEs, % suppliers from SOEs, supplier located in same city, manufacturer collectively owned, manufacturer family owned, manager formerly worked for SOE, age of manager, manager attended university.

less than a day, while 38 percent said it would take longer than one week (Table VI). We find (see Table VII, column (1)) that manufacturers who can very quickly find alternative suppliers (i.e., in less than one day) receive eleven percentage points less credit from their current suppliers, an effect significant at the .10 level. However, taking more than a week to find an alternative supplier has no effect on the level of credit ($\beta = 0.004$, $t = 0.07$).

We know less about the information the supplier has about the manufacturer, since only the latter was interviewed; but some indication of the information is available. As with customer credit, we find that relationships of longer duration involve more credit, an effect that diminishes across time. For supplier credit, however, the effect is both smaller and less statistically significant (Table VII). Credit increases three percentage points in the first year of a relationship and an additional two percentage points the second year. The duration variables are jointly insignificant ($\chi^2 = 3.06$, p-value $= .22$).[21]

A direct measure of creditworthiness is receiving loans from banks. Suppliers might get information by observing the manufacturers' relationships with banks. Manufacturers that currently receive credit from banks also receive significantly more credit from suppliers than those that do not receive bank loans ($\beta = 0.26$, $t = 3.79$).[22]

We also have some data on visits prior to the first transaction and ongoing visits. As with customer credit, the ongoing visits measure the frequency of visits by the supplier to the manufacturer's factory or from the manufacturer to the supplier's factory. The same caveats apply as before. The question related to visits prior to the first transaction asks only whether the interviewed manufacturer visited the supplier's factory. Since the supplier is the party providing credit here, such a visit would not provide any indication of the customer's (that is, the manufacturer's) level of

21. There are two observations with very long durations, 23 and 30 years. When these are excluded from the sample, the duration moves closer to zero ($\beta = 0.01$, $t = 0.26$), and its square switches sign ($\beta = 0.001$, $t = 0.23$). The estimated increase in credit in the first two years of a relationship becomes two percentage points, with an additional three percentage points in the third year.

22. Although the bank loan variable is the same as that used in the customer credit equation, the effect the variable is measuring is different. Since the question relates to whether the manufacturer currently has a bank loan, the variable does not measure liquidity effects in the supplier credit regression. We interpret the data as representing the supply of credit, on the presumption, as discussed above, that firms accept all the credit they can get. If demand factors also matter, then the positive association between receiving loans from banks and receiving credit from suppliers might indicate that the manufacturer has a higher demand for credit.

investment. We nevertheless include the variable indicating prior visits because such a visit might provide information on the business acumen and other characteristics of the manufacturer. We find that ongoing visits have no effect on credit loans ($\beta = -0.003$, $t = 0.06$) but visiting the supplier at least once before the first transaction has a small positive effect on the level of credit received ($\beta = 0.07$, $t = 1.19$).

Our measure of social networks is whether the supplier was managed by someone who was a family member or friend when the trading relationship started. The response to this question indicates a two-way social relationship between the manufacturer and the supplier. Suppliers managed by family members or friends allow customers to pay eleven percentage points more of their bill after delivery ($t = 1.70$, Table VII).[23]

Each manufacturer was asked whether its suppliers talked among themselves. Those who agreed with the statement "If I have a dispute with one of my suppliers, my other suppliers will surely find out about it" receive significantly more credit from their suppliers (the variable is coded 0 for disagree, 2 for agree, and 1 for indifferent). Because of the possible endogeneity problems as well as the questionable reliability of responses to subjective questions like this, we omit this variable from the regression reported in column (1) of Table VII. But its inclusion in column (2) has little effect on the size or significance of the other variables. Its size and significance suggest that credit is supported by community sanctions. Manufacturers whose suppliers communicate receive fourteen percentage points more credit than those whose suppliers do not communicate ($t = 3.19$).

B. Robustness Checks

The regressions in columns (3) through (6) of Table VII examine the robustness of the results in columns (1) and (2). The equation in column (3) makes just one change, using an alternative manufacturer search-cost variable—whether or not the manufacturer has an alternative supplier for these inputs. Having an alternative supplier reduced the provision of credit as expected, but the coefficient is not significant ($\beta = -0.07$, $t = 1.12$). The

23. As with customers, we also know the manufacturer's first source of information about the supplier. But since the supplier is taking the risk in granting credit, the relevant data relate to the supplier's information about the manufacturer. This the survey does not tell us. Knowing that a manufacturer heard about the supplier from a family member does not tell us anything about the relationship between the supplier and the information source.

fourth column adds three characteristics of the firms: age, size, and the percentage of sales coming from the firm's main product. Larger and older firms receive less credit from their suppliers, though only the size effect is significant. A five-year-old firm receives seven percentage points less credit than a one-year-old firm, and four percentage points more than a ten-year-old firm. A firm with 60 employees pays seven percentage points less (four percentage points more) of its bill after delivery than a firm with 20 (120 employees).

Firms with sales concentrated in one product are subject to greater risks from market fluctuations, which is reflected in a lower level of credit received from suppliers. When the sales of the main product as a proportion of total sales increase by 10 percent, the credit offered by suppliers falls by four percentage points.

Column (5) adds other variables measuring characteristics of the manufacturer and its manager. Managers who speak Chinese receive no more credit. The inclusion of the additional controls does have some effect on the relational contracting variables. Suppliers managed by family members or friends, our measure of social networks, no longer give significantly more credit than other suppliers. The effect is still positive, but drops below the 10 percent threshold when firm and manager characteristics are added. The measures of relationship duration, on the other hand, become significant when the firm and manager characteristics are added (column (5)).

Finally, as with customer credit, a minority (20 percent) of the supply relationships are with foreign-owned suppliers. In the last column of Table VII, we consider the sample of domestic suppliers. Comparing the results with those of column (4), where the specification is the same, the removal of foreign suppliers from the sample does have some effect. The variable indicating supplies that can be replaced in a day or less ($\beta = -0.08$, $t = 1.11$) and the variable indicating the supplier is managed by a family member of friend ($\beta = 0.08$, $t = 1.16$) are both slightly smaller in magnitude drop below the .10 threshold of significance. On the other hand, visits prior to the first transaction are now significantly associated with the level of credit ($\beta = 0.14$, $t = 2.11$).[24]

24. When the three variables which were added to the regression in column (2) are removed from the regressions in columns (3) through (6), the duration variables are significant at the .10 level in columns (4) and (6), and the family/friend variable is no longer significant at the .10 level in column (3). Apart from this, the exclusion of these variables does not change the results in any significant way.

As with customer credit we find that the effects of networks are enduring, suggesting that sanctions are a motivation for communicating with the customer's other suppliers (see Table VIII). The positive effect of gossip on credit does decline through time, from eighteen percentage points after one year to eight percentage points after four years. The interaction terms on gossip among suppliers are significant ($\chi^2 = 4.60$, p-value $= .10$). The duration-dependent interactive effects are not significant for suppliers managed by a family member or friend ($\chi^2 = 0.31$, p-value $= .86$). The coefficients suggest an effect that increases from nine percentage points at the end of one year to nineteen percentage points at the end of four years. Thus, both of these network variables again demonstrate durable effects.

The time-dependent effects of visits with suppliers are similar to those of visits with customers. Ongoing visits hovers around zero, while the effect of visiting before the first transaction is again transitory. Prior visits are associated with twelve percentage points more credit after one year of the relationship, but no more credit after four years.

C. Summary of Supplier Results

The main results for supplier credit are similar to those for customer credit. The manufacturer's difficulty of locating alterna-

TABLE VIII
SUPPLIER CREDIT, TIME-DEPENDENT INFORMATION VARIABLES

	Supplier managed by family/ friend	Suppliers communicate	Visited supplier before first purchase	Currently visit supplier at least weekly
Information	0.05	0.21	0.16	−0.09
	(0.39)	(2.74)	(1.26)	(0.82)
Information * duration	0.03	−0.02	−0.05	0.08
	(0.37)	(0.44)	(0.78)	(1.75)
Information * duration squared	−0.001	−0.003	0.001	−0.003
	(0.17)	(0.83)	(0.21)	(1.18)
χ^2 (2 df)	0.26	4.60	2.18	0.36
p-value	0.88	0.10	0.34	0.83
Effect of information on credit:				
duration = 1 year	0.09	0.18	0.12	−0.02
duration = 2 years	0.12	0.16	0.08	−0.01
duration = 3 years	0.14	0.12	0.03	0.01
duration = 4 years	0.15	0.08	−0.01	0.02

tive sources of supply affects credit, and the level of credit increases with the duration of the relationship (though the evidence for these is weaker on the supplier side than on the customer side). Credit is larger when there is communication among the suppliers, allowing for community sanctions.

VIII. Comparison to the Trade-Credit Literature

Our study differs from existing empirical trade-credit studies in two ways. First, we add a new explanatory variable, the availability to the customer of alternative suppliers, and find that it is associated with the credit the supplier grants to that customer. Second, we examine interfirm relationships in more detail than before. Petersen and Rajan [1997], for example, explore supplier-creditor relationships among small U. S. firms, but their data, on the firms' aggregate credit position, allow them to do so only indirectly. Our data on the credit offered by a particular supplier to a particular customer enable us to examine the determinants of the cooperativeness, as measured by credit, of the specific relationship. Nevertheless, it is instructive to compare the results for the variables that overlap.

Trade credit may be used as a means of achieving covert price discrimination. Petersen and Rajan [1997] look for price discrimination via credit by asking whether a firm's profit is associated with giving credit; with U. S. data they find a positive relationship. While antitrust policy does not prevent firms in Vietnam from price-discriminating, manufacturers might still use credit to hide price cuts from other customers. We do not have data on profits, but we do find some evidence for the use of trade credit as a means of price discrimination. Firms in our survey that set prices by the "relationship with the customer" (21 percent of the sample) or "bargaining with the customer" (25 percent of the sample) give more trade credit than those who set prices competitively (although this result is not robust to the specification of the model; see Table IV).

Trade credit is influenced by the ease of reselling the goods in the event of their being repossessed: manufacturers have an advantage over financial institutions in this regard when the goods are not immediately transformed by the customer. In the United States an increase in the fraction of the customer's inventory that are finished goods (that is, goods that the customer has already transformed and cannot easily be resold by the supplier) decreases the amount of credit supplied [Petersen and

Rajan 1997]. We know whether the customers are individuals (33 percent), other manufacturers (25 percent), or retailers and wholesalers (42 percent). We posit that the last group is least likely to transform the goods after delivery. Similar to the results from the United States, we find, for large firms but not for small firms, that more credit is offered when the customer is a retail store.

The size and age of the firm can have ambiguous effects on trade credit. If trade credit is used as a means of providing assurance of product quality (in that the customer need pay only after having had time to check the merchandise), then bigger and older firms will offer less credit because their own reputations will serve to guarantee product quality, making trade credit unnecessary [Long, Malitz, and Ravid 1993; Deloof and Jegers 1996]. On the other hand, size and age might proxy for access to formal sources of credit, and therefore bigger and older firms will offer more trade credit [Petersen and Rajan 1997]. We find that older and bigger firms offer less credit. The coefficient on log age indicates that a firm with the sample mean age of five years offers ten percentage points less credit than a one-year-old firm, and five percentage points more credit than a ten-year-old firm (Table IV, column (3)). A firm with 58 workers (the sample mean) offers two percentage points less credit to customers than a firms with 20 workers and two percentage points more than a firm with 120 workers.

We find no relationship between offering trade credit to customers and receiving a bank loan, although we find that a firm receives more trade credit if it is the recipient of a bank loan. The latter result contrasts with a finding of Petersen and Rajan [1997], that U. S. firms with longer relationships with financial institutions—those who are less credit constrained—do not receive more trade credit. Since only 20 percent of the firms in the Vietnam sample receive loans from banks, a bank loan might serve as a stronger signal of creditworthiness for our Vietnamese firms than for U. S. firms.

IX. Conclusion

Trading relations in Vietnam's emerging private sector are shaped by two market frictions—the absence of legal enforcement of contracts and the difficulty of locating trading partners—which,

we have argued, offset each other. The lack of alternative trading partners impels firms to cooperate.

Our regression results show how relational mechanisms work in allowing contracting without laws in Vietnam. A firm trusts its customer enough to offer credit when the customer finds it hard to locate an alternative supplier. When the firm has competitors nearby, it grants its customers about fifteen percentage points less credit. The firm's experience in dealing with the customer also matters: a longer duration of trading relationship is significantly associated with larger credit, at a rate that diminishes with time. After two years the amount of credit offered is fourteen percentage points higher than with a new relationship. Visiting a customer or supplier before the business relationship starts is associated with ten percentage points more credit in the first year of the relationship, although the effect diminishes over time. A customer identified through a business network receives ten to twenty percentage points more credit. When the firm talks regularly with other suppliers of the customer, it grants about twenty percentage points more credit. The network effects are enduring, suggesting that networks are used to sanction defaulting customers.

Relational contracting is not unambiguously efficiency-enhancing. Exclusion is the corollary of ongoing relationships. Continuing to deal with the customary trading partner might mean refusing to deal with new entrants, which could result in some inefficiencies.[25] The surveyed firms expressed a hesitancy to deal with trading partners with whom they had never dealt. Regarding both their longest-term supplier and their newest supplier, manufacturers were asked: "If another firm you have never purchased from offered to supply this input for a price 10 percent less than your current supplier, would you purchase from the new firm?" While only 29 percent of our respondents gave the response that simple economics would suggest, saying they would accept the bargain, 53 percent said they would buy from the new supplier while continuing to buy at the higher price from their accustomed supplier, and 19 percent said they would reject the lower-priced offer outright. If there is uncertainty about the reliability of the new supplier, it could be rational to reject the lower-priced offer. But this means, some of the time, forgoing a genuinely better deal.

25. Regressions available from the authors give some evidence that a firm's sales grow more slowly than average if it finds it hard to locate alternative suppliers for its inputs, or if its trading partners are managed by family members.

APPENDIX 1: INDUSTRY DUMMY VARIABLE COEFFICIENTS

CUSTOMER CREDIT TOBITS

	(1)	(2)	(3)	(4)	(5) Domestic	(6) Foreign	(7) Big	(8) Small
Industry group:								
Metal parts and products	−0.20 (2.04)	−0.21 (2.16)	−0.14 (1.51)	−0.16 (1.63)	−0.19 (1.70)	Base Group	−0.16 (1.54)	−0.24 (2.08)
Wood products	−0.68 (5.22)	−0.64 (5.17)	−0.40 (3.68)	−0.49 (4.22)	−0.47 (3.12)	−0.46 (2.46)	−0.37 (2.42)	−0.55 (3.23)
Food and beverages	−0.04 (0.46)	−0.03 (0.42)	0.02 0.26	0.05 (0.65)	−0.09 (0.92)	0.14 (0.80)	0.13 (0.79)	−0.01 (0.08)
Clothing and garments	Base Group	Base Group	Base Group	Base Group	Base Group	Base Group	Base Group	Base Group
Construction materials	−0.17 (1.80)	−0.19 (2.01)	−0.17 (1.99)	−0.17 (1.83)	−0.28 (2.57)	−0.04 (0.29)	−0.28 (2.31)	−0.26 (2.17)
Paper products	−0.22 (1.93)	−0.29 (2.43)	−0.16 (1.44)	−0.20 (1.69)	−0.24 (1.92)	Base Group	Base Group	−0.32 (2.90)
Handicrafts	−0.35 (2.45)	−0.41 (2.96)	−0.19 (1.47)	−0.17 (1.29)	0.03 (0.14)	−0.31 (1.47)	0.09 (0.53)	Base Group
Miscellaneous	−0.05 (0.66)	−0.06 (0.80)	−0.02 (0.29)	−0.08 (1.04)	−0.07 (0.73)	0.05 (0.44)	−0.06 (0.45)	−0.05 (0.62)
Electrical machinery	−0.09 (0.71)	−0.07 (0.63)	0.10 (0.89)	0.07 (0.65)	−0.06 (0.50)	0.22 (0.90)	−0.02 (0.11)	0.06 (0.44)

SUPPLIER CREDIT TOBITS

	(1)	(2)	(3)	(4)	(5)	(6) Domestic
Industry groups:						
Metal parts and products	−0.01 (0.11)	−0.01 (0.16)	−0.00 (0.03)	−0.09 (0.98)	−0.14 (1.29)	−0.04 (0.36)
Wood products	−0.26 (2.66)	−0.29 (2.93)	−0.26 (2.67)	−0.33 (3.31)	−0.36 (3.32)	−0.27 (2.42)
Food and beverages	−0.18 (1.90)	−0.18 (2.00)	−0.15 (1.68)	−0.24 (2.65)	−0.20 (1.99)	−0.13 (1.26)
Clothing and garments	Base Group	Base Group	Base Group	Base Group	Base Group	Base Group
Construction materials	0.02 (0.22)	0.01 (0.11)	0.01 (0.10)	−0.04 (0.37)	−0.14 (1.27)	−0.01 (0.07)
Paper products	−0.29 (1.98)	−0.29 (2.01)	−0.28 (1.92)	−0.29 (2.11)	−0.30 (2.00)	−0.16 (1.01)
Handicrafts	−0.04 (0.34)	−0.12 (0.90)	−0.08 (0.64)	−0.17 (1.41)	−0.21 (1.64)	−0.10 (0.79)
Miscellaneous	−0.06 (0.74)	−0.09 (1.03)	−0.08 (0.96)	−0.16 (1.89)	−0.20 (2.15)	−0.09 (0.86)
Electrical machinery	−0.34 (2.44)	−0.28 (2.08)	−0.29 (2.15)	−0.38 (2.72)	−0.43 (2.86)	−0.38 (2.25)

APPENDIX 2: DEPENDENT AND INDEPENDENT VARIABLE CORRELATIONS
CUSTOMER CREDIT CORRELATIONS

	% paid after delivery	% of firms w/in 1 km	Competitor nearby	Duration	Information from manuf	Information from family	Talk with suppliers	Visited cust before	Visit cust now weekly
% paid after delivery									
# of firms w/in 1 km	−0.0921								
Competitor nearby	−0.0976	0.2204							
Duration	0.0287	−0.0080	−0.0989						
Information from manuf	0.2060	−0.0238	0.0086	0.0269					
Information from family	−0.0149	0.0485	−0.0932	0.0638	0.0595				
Talk with suppliers	0.2009	0.1756	0.0157	0.0434	0.1024	0.1277			
Visited cust before 1st sale	0.1667	−0.0784	−0.2150	0.1577	0.1021	0.2421	0.2004		
Visit cust now weekly	0.0847	0.1472	0.1366	0.0867	0.0041	0.0543	0.1969	0.1555	
Industry groups:									
Metal parts and products	−0.0343	−0.0158	−0.0561	0.2256	−0.0504	−0.0068	0.0097	0.1180	0.1856
Wood products	−0.0273	−0.0532	−0.1404	0.0089	0.1260	0.1555	−0.0913	0.0745	−0.1711
Food and beverages	0.1194	0.0249	0.1205	0.0029	−0.0577	0.0942	0.0360	−0.0972	0.2293
Clothing and garments	0.1296	0.0698	0.0523	−0.0794	0.0599	0.0205	−0.0645	−0.0030	−0.0673
Construction materials	−0.0333	−0.0578	−0.1334	−0.0835	−0.0361	−0.1120	−0.0259	−0.0005	−0.0749
Paper products	−0.0651	−0.0601	−0.0221	0.0139	−0.1402	0.0274	0.1367	0.0972	0.0764
Handicrafts	−0.0574	0.1092	0.0032	0.0093	−0.0027	−0.0340	0.2807	0.0412	−0.0587
Miscellaneous	0.1282	−0.0262	0.0914	−0.0434	0.0797	−0.1130	−0.0672	−0.0781	−0.0769
Electrical machinery	−0.0464	−0.0307	0.0517	−0.0288	−0.0569	−0.0340	−0.0741	−0.0958	−0.0587

SUPPLIER CREDIT CORRELATIONS

	% paid after delivery	Replace sup in a day	Replace sup >1 week	Duration	Managed by family/ friend	Suppliers talk	Have bank loan	Visited sup before	Visit sup now weekly
% paid after delivery									
Replace sup in a day	−0.0433								
Replace sup >1 week	0.0128	−0.4469							
Duration	−0.0220	−0.0563	−0.0367						
Managed by family/ friend	0.1275	0.0310	−0.0825	0.0059					
Suppliers talk	0.2356	0.0339	−0.0601	0.1759	−0.0047				
Have bank loan	0.2137	0.0968	0.0065	−0.0723	−0.1415	0.0624			
Visited sup bef 1st purchase	0.1095	−0.1003	0.0388	0.0802	0.0958	0.0918	0.0250		
Visit sup now weekly	0.0362	0.1215	−0.1740	0.0389	0.1584	0.1240	−0.0710	0.0976	
Industry groups:									
Metal parts and products	0.0930	0.0385	−0.0950	0.1077	0.1105	0.0541	−0.0792	0.0477	−0.0349
Wood products	−0.1284	−0.1713	0.1364	−0.0160	−0.1423	−0.0083	0.0275	0.1396	−0.0510
Food and beverages	−0.0597	−0.0659	−0.0947	−0.0462	0.0295	0.0227	0.0209	−0.1270	−0.0336
Clothing and garments	0.1362	0.0664	0.1144	−0.1308	−0.0173	−0.0561	0.1065	−0.0983	0.0693
Construction materials	0.0764	0.0465	−0.1009	0.1176	0.0345	0.0608	0.0349	−0.0435	0.0217
Paper products	−0.1097	−0.0225	0.0519	−0.0175	0.0483	−0.0689	−0.0576	0.0216	−0.1025
Handicrafts	0.0528	−0.0329	0.0749	−0.0020	0.1830	0.1312	−0.0653	0.1597	−0.0280
Miscellaneous	−0.0027	0.0095	0.0259	−0.0266	−0.0173	−0.0098	−0.0777	0.0315	0.1179
Electrical machinery	−0.1342	0.1861	−0.1202	0.0475	−0.1258	−0.1601	0.0863	−0.1149	−0.0250

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