Relational Contracts and Courts

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Abstract

Using a special dataset on small and medium enterprises in India, we investigate the effectiveness of informal relationships relative to courts in both *ex ante* prevention and *ex post* settlement of business disputes. We find that availability of informal channels for dispute prevention, such as intervention by a social or business contact, does not help contract enforcement. However, we also find that, following a contract violation, relationships are used widely as a substitute for courts to settle the dispute, especially by the smaller and younger firms. While fairly developed market institutions in India resulting in low search costs for alternative partners render relational contracts fragile and explain the first result, high transactions costs of using an ineffective commercial legal system explain the second. Our findings are applicable to many other emerging countries that share the two features in varying degrees. Our analysis of *ex ante* and *ex post* incentives of a firm to deal with business disputes without courts is a unique contribution to the existing literature.

Keywords: Legal institutions, courts, informal relationships, markets, trade credit

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I. Introduction

Relational contracts between firms are a noticeably common feature of business activities in many societies. A number of studies have documented such relationships at work in different countries, including East and South Asia, Eastern Europe, Sub-Saharan Africa, and many other emerging economies, in different forms (e.g. networks of various types), and in different kinds of commercial transactions. The inter-firm relational contracts that are most common, and have received the most attention in the academic literature, involve trade credit transactions between firms (see, for example, McMillan and Woodruff, 1999a and 1999b; Bigsten *et* al, 2000; Johnson, McMillan and Woodruff, 2002; Allen *et al*, 2005; Biggs and Shah, 2006).

Why is relational contracting common in some economies, but not in others? It would seem that the clue to this question lies in the effectiveness of the court system to enforce legal contracts. In economies where courts function effectively, relational contacting would be uncommon. On the other hand, a weak legal system will cause it to flourish. In other words, the relationship between legal and relational contracting is one of substitution. However, as it turns out, this facile explanation is too simplistic, and the underlying issues are more complex.

First, even in economies where confidence in the prevailing legal system is high, informal relationships may play a meaningful role in business transactions. A wealth of empirical and theoretical literature indicates that in such economies informal inter-firm relationships supplement the courts in facilitating business contracting (Macaulay, 1963; Galanter, 1981; Baker, Gibbons, and Murphy, 1994; Grief, 1997, and Mann, 1998). Conversely, when relational contracting is effective, confidence in the court system may help. Johnson *et al* (2002) address this question in an interesting study on the relative importance of courts and relational contracts in five post-Soviet East European countries. They find that confidence in the legal system helps new relationships to start and develop, though court effectiveness is largely irrelevant to the functioning of established relationships. By and large, the findings of the above studies indicate a complementary relationship between relational contracting and formal legal contracting when the legal system works effectively.

When courts are largely ineffective and confidence in the commercial legal system is weak, what is the role of relational contracts vis-à-vis courts? Though ineffectiveness of the legal system is characteristic of a large number of countries, empirical examination of this issue

is scarce in the existing literature. Further, the literature so far has not recognized that there are actually two aspects to the issue of contract enforcement. One is *ex ante* prevention and the other is *ex post* settlement of contract failures. It is by no means certain that either informal relationships, or courts, are more effective than the other in both aspects. For example, while informal relationships may be more effective than the threat of legal sanctions in preventing contract failures in an environment where the threat is not compelling, courts may still be more efficient than relationships in settling claims following a contract failure. The existing literature has so far focused only on *ex ante* prevention of business disputes.

In the present paper, using a special dataset on credit contracts and business activities of a sample of Indian small and medium enterprises (SMEs), we examine both aspects of the choice between informal and legal channels. In many respects, India provides a natural setting to study this problem. Dominance of family businesses and business groups in the country's economic landscape imply that relational contracts are heavily used (Khanna and Palepu, 2005; Sarkar, 2010). At the same time, the court system functions poorly (see our discussion in section II of this paper). However, as we discuss below, many other countries share the same characteristics. We argue that our findings extend to them as well.

With respect to the first question, whether the availability of informal channels, such as intervention by a social or a business contact, deters contract violations, our tests yield negative results. In the context of India, the finding makes intuitive sense. Prevention depends critically on the trading partners being locked in the relationship. Such lock-in is natural when the cost of searching for new partners is high. However, in the case of India, while the commercial legal system functions poorly, creating an environment suitable for relational contracting, the market institutions are well – developed. Since our sample consists of trade credit contracts between firms, we take the size of capital markets in India as an appropriate indicator of the strength of market institutions for our purpose (see our discussion in section II below). In this situation, search costs for alternative partners are low, and the repeated-game incentives to continue current relationships are weak (Kranton, 1996; Ramey and Watson, 1996; McMillan and Woodruff, 1999a; see also Dixit, 2004, chapter 3). In other words, relational contracting is not effective in this situation, even though the court system is weak.

However, following a contract violation, the relevant considerations for the choice of informal versus legal channels to settle the dispute are quite different. Intuitively, if a contract is already breached, the absence (or otherwise) of market friction is no longer a relevant issue. What matters at this stage is the relative transactions costs of using the informal and legal channels to resolve the business dispute. Though it is essentially an empirical issue, conceivably in many such cases informal channels require less transactions costs and, hence, dominate the court system as an option. Our empirical findings confirm this intuition. We find that reliance on networked relationships to settle business disputes following a contract violation is inversely related to reliance on courts, especially among the smaller and younger firms in India. For those firms, informal relationships aid in the resolution of business disputes even in the absence of market friction.

Our explanation for both findings together can be summarized as follows. Though informal channels are not particularly useful in deterring contract violations given relatively little market friction in India, they are used following a contract violation because seeking redress through them entails less transactions costs than using an ineffective legal system. In other words, while fairly strong market institutions in India resulting in low search costs for alternative partners explain our first result, a poorly functioning legal system imposing high transactions costs explains the second. As we discuss below (see section VI), many other countries, including a number of other large emerging economies, share the two features. We argue that our findings are applicable to those countries as well.

Our analysis of *ex ante* and *ex post* incentives of the firms to deal with business disputes without courts is a special feature of our study. We are aware of no other study that has examined the relative effectiveness of courts and informal channels in resolving business disputes following a contract failure. Another special feature is that we use direct tests in both types of investigations. For example, we present a direct test to check if the probability of default on a relational contract faced by a firm in our sample decreases in the level of the firm's reliance on informal relationships to enforce contracts. Using the responses to a survey question that directly asked the respondents how much they rely on relationships in such cases, we are able to construct an appropriate variable to use in our test models. Our data further identifies the nature of the relationships in question and indicates if they are primarily driven by business connections between the owners/founders of the firms (such as membership in a common trade

association etc.) or by social connections (such as friends, family members, or members of the same caste etc.). The existing literature has usually relied on indirect evidence to examine the effectiveness of informal relationships to enforce contracts[1]. Both special features of this study are made possible by our unique dataset.

The existing literature on the relative effectiveness of informal channels and court enforcement is sparse. However, it offers a study that parallels our first investigation, though in a scenario with very different market conditions. In a study on dispute prevention without courts in Vietnam in the eighties, McMillan and Woodruff (1999b) also enquire into the effectiveness of informal relationships to prevent contract violations in the absence of a credible legal system. The authors find that the relational contracts generally worked well when repeated-game incentives were suitably supplemented with other devices, such as acquiring information about the other party through business or social networks. They recognize that their finding is due in part to the poor state of market institutions in Vietnam at the time[2]. In this respect our work, by studying a sample of firms in an environment with stronger market institutions, complements theirs. However, our work is different from theirs not only in the prevailing legal and market conditions of the two countries, India and Vietnam, but also in our broader scope including dispute settlement.

Availability of suitable data is a challenge for an empirical study on informal contracts, and explains to a large extent the paucity of the existing literature. The dataset used in this study innovatively combines two sources of data for a sample of non–financial SME's in India: (1) secondary data of trade credit transactions and other financing activities for the year 2005 complied from their financial statements and (2) the responses of the same firms in a survey of the role of relationships in contract enforcement and other business decisions. The survey was conducted across India in 2006. The secondary was obtained from the *Prowess* database of the *Centre for Monitoring the Indian Economy* (*CMIE*)[3]. Typically, for information relating to

[1] For example, in their study of informal credit and networks in Vietnam, McMillan and Woodruff (1999a, p.1305) conclude that, of the two possible benefits of networked relationships, threat of community sanctions against a defaulting partner is more important than information gains about other partners. Their conclusion is based on the insignificance of the variables reflecting information in their regression model. Their study lacks the data to construct a variable directly capturing the effectiveness of informal relationships to enforce contracts.

[2] "The success of relational contracting might be in part a consequence of another transaction cost, the high cost of searching for alternative trading partners", McMillan and Woodruff (1999b, p.653)

[3] CMIE is a Mumbai-based economic and business information and research organization. Its *Prowess* database provides financial statements, ratio analysis, funds flows, product profiles, returns and risks on the stock markets,

beliefs and perceptions (for example, the importance a given firm attaches to its informal relationships in settling disputes), we rely on the survey data, and for hard financial information (such as the amount of trade credit extended by a firm in year 2005) on *Prowess* data. We believe that this approach enables us to restrict survey data, which typically reflects the respondents' perceptions, to appropriate uses. We have also checked that our final sample is free from non-representativeness and non-randomness biases and several other problems that sometimes plague survey-based studies (see the discussion in section III.C below). Importantly, we also find that the survey responses convey meaningful information. They support a hypothesis when it is consistent with sound intuition, and reject one when it is not.

The rest of this paper is organized as follows. In section II below, we present some evidence from existing sources on law and institutions in India, and compare them to those in other emerging economies. In section III, we discuss our data, including the survey responses and the corporate financial data from CMIE *Prowess.* In section IV, we develop the variables that we use in our tests. We discuss the methodology, results, and robustness checks of our tests relating informal relationships to dispute prevention in section V, and to dispute settlement in section VI. Finally, in section VII, we present our conclusions.

II. Legal and Market Institutions in India

It is clear from the introduction that the quality of market and legal institutions in India would have an important role in our analysis. For an assessment of their quality, we rely on the evidence available in the existing literature.

The most striking fact about India's legal system is the difference between superior investor protection *in theory* as opposed to inferior protection *in practice*. Table 1 below compares India's scores along several dimensions of the quality of legal institutions with those of several other countries (USA, China, and Vietnam) and seven country groups. Our reason for including Vietnam along with the USA and China, representing the two ends of the distribution in terms of rule of law, is to be able to compare our findings with the important study by McMillan and Woodruff (1999b) referred to above. The country groups include OECD

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etc., of over ten thousand Indian companies. The database has been used in a number of existing studies (Khanna and Palepu, 2000; Bertrand, Mehta, and Mullainathan, 2002; Gopalan, Nanda, and Seru, 2007).

countries, a group of sixteen large emerging economies (not including India), and five geographic groups of developing economies: Latin America and Caribbean, East Asia and Pacific, Middle East and North Africa, South Asia (excluding India) and Sub – Saharan Africa. Over the period 1990-2007, the sixteen emerging countries were among the top twenty in the world in terms of GDP growth rate.

[Table 1 here]

With its English common-law origin, India has strong investor protection on paper. For example, India's scores on creditor rights (4 on a 0 - 4 scale in La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (LLSV, 1998) based on the Companies Act of 1956 of India) and shareholder rights (5 on a 0-6 scale in Djankov, La Porta, Lopez-de-Silanes and Shleifer (DLLS, 2008) are in fact the highest of any country in the world. Though the score on creditor rights was subsequently downgraded to 2 in Djankov, McLiesh and Shleifer, (DMS, 2007), even with a revised score of 2 India ranks higher than all countries and the average for all country groups in the table, including the OECD countries (1.96) and the sixteen emerging economies (average 1.69).

To assess the effectiveness of the legal system for contract enforcement, we consider two measures. First, by the legal formalism index (DLLS, 2003), a measure of the level of intervention in the country's judicial process on a 0 – 7 scale whereby a lower score is more desirable, India's index, 3.34, is considerably higher than for the USA (2.62) and somewhat higher than the OECD average (3.18). However, it is comparable to the score for Vietnam (3.25) and China (3.41) and actually lower than the average for the emerging economies (4.00) and the other country groups except sub-Saharan Africa (3.31). The legality index (Berkowitz, Pistor, and Richard (2003)), a composite measure of the effectiveness of a country's legal institutions, represents the weighted average of five different estimates of the quality of legal institutions and government in the country. The index ranges from 0 to 21, with a higher score indicating a more effective legal system. India's score (12.8) is appreciably lower than for the USA (20.85) and the OECD average (20.08). However, it is better than the average for the sixteen large emerging economies (10.59) and all other developing country groups. In other words, based on available evidence, India's commercial legal system is less effective in contract enforcement than the system in developed countries, though India compares well with other emerging economies in

this respect.

Since the beginning of the process of economic liberalization in India in 1992, two improvements have taken place in the area of court enforcement of loan contracts – the establishment of the quasi-legal Debt Recovery Tribunals that have reduced delinquency and, consequently, improved lending rates (Visaria, 2007), and the passing of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act in 2002 and the subsequent Enforcement of Security Interest and Recovery of Debts Laws (Amendment) Act in 2004. These laws have paved the way for the establishment of Asset Reconstruction Companies and somewhat improved the ability of the banks and financial institutions to act against defaulting borrowers. However, a reliable sample of observations on the effectiveness of the measures is not yet available.

Corruption is a major systemic problem in many developing countries and particularly in India. Studies by the World Bank (e.g. World Development Report, 2005) have found that corruption was the number one constraint for firms in South Asia. The two most corrupt public institutions identified by the respondents in India (as well as in most countries in South Asia) were the police and the judiciary. Based on Transparency International's Corruption Perception Index, India had a score of 3.5 on a 0 - 10 scale in 2006 (a higher score means less corruption), far lower than the score for the USA (7.3) and the OECD average (7.74), and marginally lower than the average for the large emerging economies (3.60). However, India scores higher than Vietnam (2.6), China (3.3), and most developing country groups.

As the discussion above indicates, despite strong protection provided by the law, legal institutions for contract enforcement in India are considerably weak in practice, in part due to corruption within the government. For an assessment of India's market institutions, we consider the size of the domestic capital markets as given by the sum of private bank credit and market capitalization (both as ratios to GDP). The size of the corporate bond market in India is negligible. Table 2 below compares India's capital markets in 2005 (the same year as the corporate financial data that we use in this study) with those of the same country groups and individual countries as in Table 1 before.

[Table 2 here]

From the table, the total size of India's capital markets as a ratio to GDP (0.97) is distinctly lower than for the USA (3.23) and the OECD average (2.19). However, it is equal to the average for the group of sixteen large emerging economies (0.97), and considerably higher than the average for each of the other developing country groups. Of them, sub-Saharan Africa records the lowest figure (0.31). India's capital markets are also considerably larger than the markets in China (0.63) and Vietnam (0.59).

To synthesize the discussion above, Figure 1 plots the size of the external markets in India, the other countries and country groups from Table 2 above versus the effectiveness of their respective legal systems for contract enforcement as indicated by the corresponding legal formalism scores from Table 1.

[Figure 1 here]

India lies far below and to the right of the USA and the average OECD country, suggesting a less effective legal system as well as far smaller external markets. Though the legal environment in India seems marginally more effective than the group of large emerging economies, the external markets are very comparable in size as we have noted above. Compared to Vietnam and China, India offers similar legal effectiveness but larger capital markets. India offers more of both than the developing country groups.

III. Data

As we have indicated above, the dataset used in this study combines corporate financial information from the CMIE *Prowess* database with survey data. For our analysis in this paper, we optimize the use of the two types of data in our dataset. Typically, for information relating to beliefs and perceptions (for example, the importance a given firm attaches to its informal relationships in settling disputes or selling its products), we rely on the survey data, and for hard financial information (such as the amount of trade credit extended by a firm in year 2005) on *Prowess* data. The combined data is very rich. For example, it enables us to identify the extent of informal relationship-based credit in the total inter-firm credit received or extended by each firm in our sample. In the case of relationship-based credit, we are further able to identify the nature of the relationship in question and determine if it is primarily driven by business

connections between the owners/founders of the firms (such as membership in a common trade association etc.) or by social connections (such as friends, family members, or members of the same caste etc.).

A. Corporate Financial Data from Prowess

Our sample includes only SMEs. Our choice of the sample was driven by two factors. The first factor is our focus on trade credit transactions. There is ample evidence that trade credit is a very important source of financing for Indian SMEs[4]. Evidence from existing studies (e.g. Allen, *et al* 2009) also indicates that trade credit deals between Indian SMEs are often not backed by legal or even written contracts. In other words, such transactions are suitable observations on relational contracting. Second, SMEs constitute an important segment of the Indian economy. Micro enterprises and SMEs together account for 8% of India's GDP, 50% of total manufactured exports, 45% of India's total industrial employment, and 95% of all industrial units.[5]

In our sample selection we follow the official definition of an SME (*vide* Micro, Small and Medium Enterprises Development Act 2006, Government of India). The definition is different for manufacturing and services sectors. A manufacturing firm that has investments in fixed assets of plant and machinery below Rs. 100 million (US$ 2.22 million) qualifies as an SME; for firms in the services sector, the ceiling is Rs. 50 million (US$ 1.11 million) in fixed assets.

Many SMEs in India are not organized as business units. The *Prowess* database of CMIE provides information on corporate financing and other firm characteristics of SMEs registered under the Indian Companies Act, 1956. For our analysis in this paper, we use corporate financial information from CMIE *Prowess* for year 2005, the last financial year before our survey (see below).

[4] For a sample of about 9,000 Indian SME's in Allen, et.al 2009 (table 6), almost 16% of their total funding during 2001-2005 came from trade credit. It was by far the single biggest source. Using financial reports of around 2,000 *public* companies from 1990-91 to 2002-03, the *Reserve Bank of India* (2005) finds that the smaller Indian firms depend heavily on trade credit for their funding needs and much more so than the larger firms. Using balance sheet information for nearly 6,000 Indian firms between 1994-2003, Love and Peria (2004) come to a similar conclusion.

[5] See Shamika Ravi, "Entrepreneurship Development in the Micro, Small and Medium Enterprise Sector in India" (2009)

B. Survey Responses

In order to understand the transactions based on informal relationships between the Indian SMEs, we conducted a survey in 2006. At the time of our survey, the *Prowess* database included 680 SMEs that satisfied two important conditions for our purpose: (1) they had no financial business and (2) complete financial information was available for them for the previous five years (2001-2005). The last condition represents a compromise between two conflicting considerations. Relationships take time to develop and nurture which required us to consider firms with a reasonably long life. On the other hand, any time restriction of the kind introduces survivorship bias in the sample. A length of five years seemed to us enough time for the firms to develop and cement relationships, but not long enough for the complications arising from survivorship to distort our analysis unduly. Our target population comprised the 680 firms.

The survey instrument including all the questions was designed by the researchers at Centre for Analytical Finance, Indian School of Business (ISB), Hyderabad, India. Based on a review of survey-based papers in the law and economics literature (e.g. McMillan and Woodruff, 1999a; Johnson *et* al, 2002), the survey questionnaire paid special attention to the important issues in the legal and financial environment in which Indian SMEs operate, while trying to avoid biases induced by the questionnaire and maximizing the response rate. The questions focused on company history, factors affecting company operations, corporate financing practices, relations with banks and financial institutions, informal inter-firm relationships and trade credit transactions, and business and social relationships between the owners/founders of the firms. The final survey instrument was detailed, with a total of 99 questions (most with subparts) in three sections. The survey instrument and the tabulated responses are available on request.

We did not use the telephonic or the mailed questionnaire method to administer the survey. The nature of our questions probing important business and relationships issues required us to ensure that the responses came from the owners or top executives of the surveyed units. We also wanted to make sure that the respondents clearly understood the scope of the questions and the purpose of the survey. Consequently, we administered the survey in face-to-face interviews with the respondents. The survey was conducted in fall, 2006. We were able to administer the complete survey to 141 firms. The success rate of 21% was very satisfactory,

particularly given the length of the survey and our requirement of personal interviews with top executives.

The sample spans several industries including metal and crude oil extraction, engineering, chemicals, construction, real estate, wholesale and retail trade, and software. Two-thirds of the survey firms are in manufacturing, and the other one-third in services. Firms manufacturing chemicals and chemical products constitute almost 15% of the sample. Construction companies, manufacturers of basic metals and manufacturers of food products & beverages account for 9%, 8% and 7% respectively of the sample. In 2005 (the last financial year before the survey), the sample firms ranged in age from 5 years to 129 years, with the median age of 19 years. In terms of asset size and sales, samples firms range from $0.13mn. to $46.31mn., and zero to $76.28 mn. respectively. Location-wise, the surveyed firms cover almost all regions in India, with a greater concentration in Southern India (almost 41%)[6].

For two-thirds of the firms, the top manager belongs to the founding family. For the larger firms (by the number of employees), the proportion increases to three-fourths. For most firms, the owner is actively involved in day-to-day management. Twenty-one percent of the surveyed firms (29 in all) reported cases of customer default.

Table 3A below presents summary of the survey data. Table 3B, on the other hand, reports the summary statistics of the firm characteristics, such as assets, sales, trade credit received and extended, terms of credit, of the surveyed firms in year 2005 using information from *Prowess* database. Between them, the two tables reflect our strategy of relying on *Prowess* for financial information and survey data for other types of information, including qualitative information

[Table 3A & 3B here]

We have noted above that evidence from existing studies indicates that trade credit is a very important source of financing for the Indian SME's. This is true of our sample firms as well. Trade credit accounted for over 16% of their total sources of funds during 1996-2005, next only to stock financing and bank credit. On the other hand, extension of trade credit was the

[6] Based on Registered office addresses.

second biggest use of their funds over the same period, accounting for as much as a third of the total funds spent in a year[7].

C. Possible Sample Biases

The survey approach allows the investigators to ask unique project-specific questions, with the possibility of generating important information that cannot be available from secondary sources. However, the approach is not without potential problems that can introduce biases in analysis based on survey responses (see Graham *et al*, 2008). We recognize the problems and address them, as we believe, successfully for the most part.

There are problems inherent in the survey method itself. Survey questions can be misunderstood, or otherwise generate noisy information. Our method of administering the survey in a face-to-face interview with the respondent, offering the respondent an opportunity to seek clarifications if necessary, alleviates the problem. Then, self-reporting of information by the respondent is usually fraught with the risk of under-statement of undesirable traits and exeggeration of desirable traits. In our particular case, this problem would be minimal, if at all present. The survey questions used in the present study typically avoid all performance-related queries, including particularly financial performance; we use CMIE *Prowess* data for that purpose. Finally, a common, and usually valid, criticism of surveys is that they measure beliefs and perceptions, not actions. In our case, however, it works to our advantage. Typically, for information relating to beliefs and perceptions (for example, the importance a given firm attaches to its informal relationships in settling disputes), we rely on the survey data, while for information relating to financial activities (such as the amount of trade credit received or extended by a firm) we use *Prowess* data.

A final set of problems relating to the nature and size of the sample of firms surveyed may affect the statistical analysis based on the sample. First, the sample may not be representative of the population it is drawn from, namely the population of 680 similar firms in *Prowess* database. To verify this, for year 2005 (the last year before the survey was conducted), we conduct large sample mean difference tests between the sample firms and the 680 SME*s*[8] for

[7]The figures are based on data taken from the *Prowess* database, and not from survey responses, consistent with our strategy of relying on *Prowess* for financial information.

[8] To smoothen the distribution, we exclude outliers from the *Prowess* population by winsorizing the top and the bottom 2.5% of the firms on the basis of total assets.

five important firm-specific variables for our case, including total assets, sales, trade credit received and extended, and bank credit. The hypothesis that the corresponding means are not statistically different is supported by the data in all cases. We do the same analysis for manufacturing and services firms separately, and again do not find significant statistical differences between the means except in one case where there is weak evidence of inequality (between mean sales for the sample firms in services and the corresponding population mean). We wanted to extend this analysis to each industry represented in our final sample. However, the sample size in each industry is too small for the purpose.

Our sample is not a random sample, and includes firms that we were able to survey. To check whether the characteristics of the firms in our sample differ significantly from a randomly drawn sample, we carry out *non-parametric with-replacement* random sampling[9] to generate 2,000 random samples, each of size 141, from the *Prowess* population of 680 non-financial firms that satisfied our sample selection criteria. For the year 2005, we calculate the averages of the corresponding means and standard deviations of different firm-specific variables across the 2,000 random samples. For each variable, we conduct a mean-difference test between our sample firms and the average of the random samples. The hypothesis that the corresponding means are not statistically different is again supported by the data in all cases. We repeat the analysis for manufacturing and services firms separately. As before, except in one case, we do not find any evidence that the means are statistically different.

We conclude that the sample used in this study is free from non-representativeness and non-randomness biases. The details of the test results supporting this conclusion are reported in appendix at the end of this paper.

IV. Variables

A. Relationship Indices

Using the responses to a survey question about the importance of various informal channels (such as business contacts, family members etc.) in resolving contract disputes, we construct three indices for each firm in the sample that responded to the question (130 firms). The indices indicate the degree of its reliance on inter-firm relationships for contract enforcement.

[9] See M N Murthy, *Sampling Theory and Methods*, Statistical Publishing Society, 1967

- Contract enforcement using relationships ($CE^{Relation}$) index, based on responses to a question if the respondent firm relies on informal relationships to resolve contract disputes. The question mentions nine types of relationships, four of them arising from business and the other five from social interactions.
- Contract enforcement using business relationships ($CE^{Business}$) index, based on the four types of business relationships mentioned above;
- Contract enforcement using social relationships (CE^{Social}) index, based on the five types of social relationships mentioned above.

Clearly, by construction $CE^{Business}$ and CE^{Social} indices are partitions of the $CE^{Relation}$ index. Table 4, panel A, reports the questions as well as the mean responses for each question for our sample of firms.

[Table 4 here]

Note from the table that the respondents rated the importance of each relationship on a 1-5 scale (1 = not important at all; 5 = extremely important). For a given firm, the index value is the average of its ratings for all the relationships listed in the question. As an example, suppose the ratings given by a sample firm for the four types of business relationships listed in the question are 5, 4, 3, and 1. Thus, the value of the $CE^{Business}$ index for the firm is 13/4 or 3.25.[10] Clearly, the value of an index ranges from 1 to 5 for each respondent firm. Higher value of an index indicates greater reliance on the relationships (business or social) for resolving disputes. Note that the types of business or social relationships listed in the question are not mutually exclusive. For example, a related party may belong to the same industry (business relationship type 4) *as well as* the same professional association (business relationship type 3) as the respondent firm. Though both associations are possible sources of a business relationship, our index construction method, by averaging the weights a respondent firm attaches to all the listed relationships, addresses the problem that a particular relationship may be over-weighted because it is associated with two or more types listed in the question. Though our index construction procedure is largely similar to Johnson *et al* (2002), an additive index such as they use in their study is not appropriate in our case.

[10] If a firm does not rate a relationship, the non-response is ignored in calculating the index

It is important to note that, in the context of our study, the difference between the business and social relationship variables derives from the *source* of the relationship (e.g. a relative as opposed to a business acquaintance) rather than the *consequence* of the relationship which is the same for both types of indices (such as business transactions).

Panel B of Table 4 reports the summary statistics of the indices for our sample of firms. On an average, firms seem to attach more importance to business relations than to social relations in negotiations with the suppliers/customers involving default or breach of contract. mean (median) value is 3.24 (3.40) for $CE^{Business}$ index and 2.74 (2.60) for CE^{Social} index.

B. Proportions of Relationship-based Trade Credit

The survey included two questions asking the firms to indicate the proportion of their total trade credit coming from and going to specific types of relationships on a 0 – 1 scale. Both questions mention seven types of relationships, three of them arising from business and the other four from social interactions. Table 5, panel A, reports the questions as well as the mean response for each question.

[Table 5 here]

Corresponding to the three relationship indices, for each firm in our sample we would like to determine the proportions of total credit received from and going to the three relationship categories: all relationships, business relationships, and social relationships. To do so, we use two methods. First, we use a simple additive method. As an example, suppose the proportions mentioned by a sample firm for the four types of social relationships listed in the question about trade credit extended are 5%, 10%, 10%, and 5%. Thus, 30% is the proportion of the firm's total trade credit going to all social relationship – based borrowers. Using this method for each firm in the sample that responded to the question, panel B of Table 5 reports the summary statistics for the proportions of the total trade credit that the firms in our sample in a typical year extended to their customers based on relationships (median proportion 0.33 or 33%), based only on business relationships (16%), and only social relationships (17%). 138 firms responded to the question. Similarly using the additive method, panel B also reports the summary statistics for the proportions of the total trade credit that the firms in our sample typically received from their suppliers based on relationships (median 32%), only business relationships (16%), and only social relationships (12%). 125 firms responded to this question. We draw the reader's attention

to a few implications of the reported figures. First, the median value of the proportions of relationship-based trade credit extended and received by the firms in our sample is 33% and 32% respectively, indicating that the average firm in our sample depends on relationships for about a third of its credit sales and credit needs. Second, every firm in our sample appears to have relationship - based customers and suppliers, though the proportions vary considerably across our sample of firms, from 8% to 100% for both credit extended and credit received. Third, business relationships are more important than social relationships in getting trade credit. However, they are about equally effective in generating credit sales.

While the simple additive method is very intuitive, it is also problematic. The different types of business or social relationships listed in the question are not mutually exclusive. For example, a related party that belongs to the respondent's extended family (social relationship type 1) must also speak the same native language (social relationship type 4). Though both associations, individually, are meaningful sources of a social relationship, a particular relationship may be over-weighted because it has both types of association with the respondent firm. To correct this, we use a second method following Rao (2002, ch.4). Under this method, we calculate a weighting matrix such that the corresponding correlations among the four different types of social relationships listed in the question are zero. We conduct a Principal Components Analysis of the responses given by the firms for the four relationships. The weighting matrix in this case is $\Sigma^{-\frac{1}{2}} = \frac{1}{\sqrt{\lambda_1}}u_1u_1' + \frac{1}{\sqrt{\lambda_2}}u_2u_2' + \frac{1}{\sqrt{\lambda_3}}u_3u_3' + \frac{1}{\sqrt{\lambda_4}}u_4u_4'$, where Σ is the dispersion matrix of the responses, $\lambda_1, \lambda_2, \lambda_3$ and λ_4 are eigen - values of Σ and u_1, u_2, u_3 and u_4 are the corresponding eigen - vectors. We use the weights to transform the original responses. In a similar manner, we transform also the responses for the business relationships and all relationships listed in the question. We use the transformed proportions to re-compute all the figures in panel B of Table 5. To save space, we do not report the re-computed figures. However, in our regression tests, we use the figures obtained by using the second method as a robustness check on the results using the first method.

In the rest of the paper, we use the proportions based on the first method as the base case, and refer to them as base - case proportions. To eliminate confusion, we refer to the proportions based on the second method as transformed proportions. We mostly use the transformed proportions to check the robustness of results obtained with base – case proportions.

C. Volume of Relationship – based Credit

Trade credit extended typically takes the form of credit sales. Similarly, trade credit received typically is goods and services bought on credit. Using the proportion figures for a given firm in our sample, and the information about total trade credit it actually received and extended in 2005 from *Prowess* database, we estimate the dollar value of relationship-based credit received and extended by the firm. For each firm in the sample, we compute $TCX^{Relation}$ (trade credit extended to relationship – based customers), $TCX^{Business}$ (trade credit extended to business relationship - based customers), and TCX^{Social} (trade credit extended to social relationship - based customers). We also compute $TCR^{Relation}$ (trade credit from related suppliers), $TCR^{Business}$ (trade credit received from business relationship-based suppliers), and TCR^{Social} (trade credit received from social relationship-based suppliers). Panel C of Table 5 reports the summary statistics of the relationship-based inter-firm credit received and extended by the firms in our sample. The proportions underlying the dollar figures reported in the table are base – case proportions based on the simple (unweighted) additive method. We have also computed the dollar figures using the transformed proportions, but do not report them to save space.

Note from the panel that the minimum number recorded for each variable is zero. Though, as we have observed above, in a typical year each firm in our sample channels a positive fraction of its total credit sales to relationship-based customers and, similarly, receives a positive fraction of its total credit needs from relationship-based suppliers, in 2005 eight firms in our sample had no credit sales at all and 1 firm received no trade credit.

Note also from panel C that all the distributions of relationship – based credit extended as well as received appear to be left – skewed. The means of the distributions exceed the corresponding medians considerably. In the results section we see an explanation for this pattern.

D. Credit Terms

The survey questionnaire included a question asking the respondent firms to state the terms for the trade credit they extend, including the length of the credit period and the discount for timely payment. A payment during the stated period qualifies for the discount. Significantly,

the firms stated that they offer the same credit terms to all customers, including relationship-based customers.

To compute the effective annualized cost of credit in a given case, we use the trade credit discount offered, as stated by the surveyed firms, along with the *actual* length of the period the loan remained outstanding. The latter figure was computed from *Prowess* data for the firms.[11] We were able to determine this cost for a total of 106 firms in our sample. Chart 1 below presents the frequency distribution of the trade credit terms (*TCT*) for the 106 firms. Note that the 10% – 30% cost range includes the highest proportion of the computed costs (41%). The median annual cost is 15.8%.

[Chart 1 below]

E. Default Frequency

The surveyed firms were questioned about the occurrence of default on credit they had extended. Out of the 141 firms in our final sample, 29 reported default but did not specify if the default was on relationship – based credit or not. Using the survey responses, we construct a variable D_i^R representing frequency of default on relationship – based trade credit contracts faced by firm *i* in our sample. The variable takes three forms depending on the type of the relationship in question: $D_i^{Relation}$, $D_i^{Business}$, and D_i^{Social} indicating default on relationship - based credit, business relationship – based credit, and social relationship - based credit respectively. In each form, the variable is discontinuous, with a value between 0 and 1, reflecting the exposure of a firm in our sample to default on relationship – based credit, and zero otherwise. The exposure is measured by the proportion of total credit extended to relationship – based customers. For example, if the proportion is 40% for business relationship-based credit, the variable $D_i^{Business}$ takes a value of 0.4 if the firm reports a default, and zero otherwise. Note that the two sets of proportion variables – base-case proportions and the transformed proportions – lead to two different sets of default frequency variables.

[11] Following standard accounting practice, we computed Average Collection Period (ACP) to estimate the actual length of time it takes a creditor firm to collect its loan: ACP = average volume of trade credit extended in a year ÷ annual sales/365), and indicates the number of days of sales that the volume of uncollected credit amounts to.

F. Correlation Matrix

Table 6 below presents the correlations between the variables discussed above for our sample of firms: default frequency variables ($D_i^{Relation}$, $D_i^{Business}$, and D_i^{Social}), contract enforcement using relationships variables ($CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social}), variables indicating the amount of trade credit extended in relationships ($TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social}), and trade credit terms (TCT_i). For the record, the default frequency variables and trade credit extended variables used in computing the correlations reported in the table are based on base-case proportions.

[Table 6 here]

The correlations reported in the table reflect certain unmistakable patterns. Correlations between the variables of a common group (such as contract enforcement variables) are quite high. Since $CE_i^{Business}$, and CE_i^{Social} indices are partitions of the $CE_i^{Relation}$ index by construction, one would naturally expect the two indices to have a high correlation with the $CE_i^{Relation}$ index. The correlations are indeed as high as 0.91 and 0.94 respectively. However, the correlation between the two partitions is also quite high, 0.70 (significant at 1%). It indicates that the firms that rely on business relationships for contract enforcement also rely on social relationships. We see the same pattern for other groups of variables as well, including default frequency variables ($D_i^{Relation}$, $D_i^{Business}$, and D_i^{Social}), and variables indicating the amount of trade credit extended to relationships ($TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social}).

The correlations across groups are consistent with expectations in some cases. Amount of trade credit extended to relationship-based customers ($TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social}) and cost of credit (TCT_i) are positively correlated with default frequency variables ($D_i^{Relation}$, $D_i^{Business}$, and D_i^{Social}). Though the correlations are not high (in the 20%-29% range), they are significant at 1% or 5% level, consistent with the intuition that default increases in quantity as well as price of credit. However, contract enforcement using relationships variables ($CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social}) appear to have positive correlations with default frequency variables. Though the correlations are not high (under 24% in all cases), they are mostly significant. If relationships are effective in enforcing contracts, one would expect negative correlations. This issue requires further examination. Finally, the correlations between amount

of credit offered ($TCX_i^{Relation}$,$TCX_i^{Business}$, and TCX_i^{Social}) and cost of credit (TCT_i) are negative, though mostly very small. Based on this limited evidence, supply of relationship-based credit does not seem to be influenced by its price.

V. Informal Relationships and Contract Enforcement - Dispute Prevention

A. Basic Tests

Does the reliance of credit providers on informal channels for contract enforcement influence default on relationship – based trade credit? To investigate this issue, we estimate a family of three regression models represented by the following generic equation:

$$D_i^R = \beta_0 + \beta_1 CE_i^R + \beta_2 TCX_i^R + \mathbf{FC}_i\beta + \nu_i, \quad i = 1, 2, \ldots, 120 \qquad (1)$$

In our tests, the dependent variable (D_i^R), frequency of default faced by firm *i* in our sample on relationship - based credit contracts faced, changes depending on the type of relationship. It takes the form $D_i^{Relation}$ for relationship-based credit, $D_i^{Business}$ for business relationship-based credit, and D_i^{Social} for social relationship-based credit. As we have discussed above, in each form the variable is discontinuous, with a value between 0 and 1, reflecting the exposure of a firm in our sample to default on relationship - based credit, and zero otherwise. Since 29 firms in our sample experienced default, the variable has a positive value in 29 cases and zero in others. CE_i^R represents indices indicating reliance on relationships for contract enforcement for firm *i*. Depending on the particular type of relationship, it is $CE_i^{Relation}$, or $CE_i^{Business}$ or CE_i^{Social}. Similarly, TCX_i^R represents the volume of trade credit extended to relationship-based customers and, depending on the relationship, is $TCX_i^{Relation}$, or $TCX_i^{Business}$, or TCX_i^{Social}. In our regression tests, we use credit figures scaled by the total assets of firm *i*.

The $\mathbf{FC_i}$ vector includes a set of characteristics for firm *i* in the sample, including total assets, sales, firm age (all of them appropriately scaled)[12] and two control dummies: Industry (0 = services, 1= manufacturing) and Listing (0 = unlisted, 1= listed). The inputs for the $\mathbf{FC_i}$ vector are taken from corporate financial information in the *Prowess* database.

For a total of 128 firms in our sample, we have all the required information for the variables included in equation (1). However, eight firms had zero credit sales in 2005. For

[12] We scale Sales as Log (1+Total Sales), Total Assets as Log (Total Assets) and Firm age as Log (1+ Age).

them, occurrence of default was perforce zero. We excluded the eight firms from our tests. For the remaining 120 firms, panel A of table 7 reports the results of the three tests with $D_i^{Relation}$, $D_i^{Business}$ and D_i^{Social} respectively as the dependent variable. The tests conducted were two-sided *TOBIT* regressions.

[Table 7 here]

Note from the table that the coefficients of the indices indicating reliance on relationships for contract enforcement – $CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social} – are positive in all three specifications, though none of them are statistically significant. If the informal channels were effective in lowering the occurrence of default on credit sales, the coefficients would be significantly negative. The results indicate that the informal channels are not effective.

The coefficients for variables indicating trade credit extended to relationship-based customers, $TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social}. , are all positive and significant. The results uniformly indicate that default probability increases in the quantity of relationship-based credit. The results are intuitive. They are also economically very significant. For example, the reported coefficient of $TCX_i^{Relation}$ in the table, 1.63, corresponds to an increase in default probability of as much as 0.99, inducing certain default, if the credit extended by the median firm in our sample increases by one standard deviation of the distribution reported in table 5C before[13]. The economic significance of the regression results for $TCX_i^{Business}$, and TCX_i^{Social} are also equally high. The observation that default probability increases sharply in relationship – based credit extended presumably explains the left – skewed distribution of relationship – based credit that we have noticed before (see section IV.C). Most suppliers of credit are cautious about extending credit, particularly given that informal relationships are not effective in preventing default.

Normally, firm characteristics such as assets size, sales, and age are supposed to proxy firm quality. High-quality firms may be selective about their credit customers; they may have efficient screening procedures. Their customers, on their part, may also be less inclined to default against high-quality firms; the value of on-going relationships could be high in such

[13] From Table 5C, standard deviation of $TCX^{Relation}$ distribution is \$2.11 mn. From Table 3B, the total assets of the median firm are \$3.44 mn. Hence, the increase in default probability caused by a one standard deviation change in $TCR^{Relation}$ is 1.63*2.211/3.44 = 0.99

cases. We see evidence of this in the results for sales. Higher sales have a significantly negative effect on default probability. The results for the other firm characteristics are insignificant.

Next, we investigate whether default probability increases in cost of credit charged to credit customers, in addition to quantity of credit. To do so, we test equation (1′) below. Note that it is equation (1) above augmented with TCT_i, credit terms offered by firm *i*, as an additional regressor.

$$D_i^R = \beta_0 + \beta_1 CE_i^R + \beta_2 TCX_i^R + \beta_3 TCT_i + \mathbf{FC}_i\beta + \nu_i \quad i = 1, 2, \ldots, 98 \qquad (1')$$

Panel B of Table 7 reports the results of the tests. Note that the tests are conducted with 98 observations. We have mentioned above that we have credit terms information for 106 firms. Of them, eight firms had no credit sales in 2005. From panel B, the coefficients of TCT_i are significant at 1% level in all three tests, indicating that higher costs of credit increase chances of default strongly. The results are economically significant. For example, the reported coefficients of TCT_i in the three regression models - 0.47, 0.45, and 0.40 - correspond to an increase in default probability of 0.24 , 0.23 , and 0.21 respectively for a one standard deviation change in terms of credit[14]. Interestingly, the coefficients for $TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social} are also stronger than in panel A. Taken together, the results indicate that an increase in either quantity or price of credit increases default probability. The results are intuitive.

However, the coefficients of the other variables remain virtually unchanged including, importantly, the indices for reliance on relationships for contract enforcement, $CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social}. They remain positive but insignificant in all specifications as before.

B. Robustness Tests

To check the robustness of the results of the tests of equations (1) and (1′) discussed above, we estimate the equations again with transformed D_i^R and TCX_i^R variables. Recall from section IV above that the transformation was carried out to eliminate the possible correlations among the different types of relationships listed in a question, so that none of the relationships is over-weighted in estimating the proportions of credit going to relationship – based customers. The results are reported in Table 8 below.

[Table 8 here]

[14] From table 3B, the standard deviation of the TCT_i distribution is 50.1%.

The coefficients of the regressors in table 8 are very similar in size as well as significance to those in table 7 before. The indices for reliance on relationships for contract enforcement - $CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social} – are again positive but insignificant in all specifications. In other words, all the twelve regression models (six in Table 7 and another six in Table 8) that we have estimated uniformly indicate that informal relationship have no effect on occurrence of default. The conclusion that informal relationships are ineffective in preventing contract failure is robust.

Also, as before, an increase in either quantity or price of credit appears to increase default probability. This also is a strong result.

The striking similarity of the results with and without the transformed variables indicates that correlations between different types of relationships were not a serious problem after all. It also indicates that the information value of the survey responses is reassuringly high. The respondent firms were careful to separate the relationships in their responses.

C. Endogeneity Check

To rule out the possibility that the above results for relationships are biased due to an endogeneity problem in our regression models, we conduct tests following Wooldridge (2002, p. 184). If the firms facing higher chances of default on relationship-based credit rely more on informal channels for contract enforcement, the contract enforcement through relationships variables, $CE_i^{R,}$, in equations (1) and (1′) could be influenced by the dependent variables, D_i^R, resulting in a reverse causation problem. For thoroughness, we check this issue for each of the three models in equations (1) and (1′) with base-case as well as transformed D_i^R and TCX_i^R variables, in other words a total of twelve times. Since the procedure is the same each time, we discuss it only once below, but report the results for all cases in tables 7 and 8.

Corresponding to equation (1), we estimate the $CE_i^{R,}$ variables using the following generic equation:

$$CE_i^R = \beta_0' + \beta_1' D_i^R + \beta_2' TCR_i^R + \mathbf{FC}_i\beta' + \nu_i' \qquad (2)$$

As in equation (1), the dependent variable in (2) changes depending on the type of the credit, and becomes $CE_i^{Relation}$, or $CE_i^{Business}$, or CE_i^{Social}. In (2), TCR_i^R is used in place of TCX_i^R for exact identification of equations (1) and (2). TCR_i^R represents, depending on the test, $TCR^{Relation}$, or

$TCR^{Business}$, or TCR^{Social}. The results for equation (2) are not reported, because the Wald test statistic and the corresponding *p*-value in each of the three tests of equation (2) suggest that the two equations, (1) and (2), are exogenous. However, the test statistics are reported at the bottom of panel A of table 7 for base-case variables, and panel A of table 8 for transformed variables. Similarly, the corresponding test statistics for our examination of endogeneity in equation (1′) are reported at the bottom of panel B of tables 7 and 8. Note that in all cases the results reject endogeneity.

VI. Informal Relationships and Contract Enforcement - Dispute Settlement

As we have noted above, out of the 141 firms in our final sample, 29 experienced default on credit sales. Among the 29 firms, only two relied on courts to settle the disputes; the others used informal channels or did not initiate any action.

To proceed further, we are required to address two data issues. First, since the 29 firms that faced customer default do not constitute a random sample, standard regression analysis based on this sample may yield biased estimates. Therefore, we use two – stage Heckman procedure[15] to correct for selection bias. The selection stage involves predicting customer default on all 129 firms in our sample[16].

Second, since the number of observations is only 29, the parameter estimates from logistic regressions may not be reliable. Therefore, we use *with-replacement* non-parametric bootstrapping to generate samples of size 29 using the original data[17].

We test a family of three models represented by the following equation:

$$ROL_i = \beta_0 + \beta_1 CE_i^R + \mathbf{FC}_i\beta + \sigma\hat{\lambda}_i + \epsilon_i, \quad i = 1, 2, ..., 29 \qquad .... (3)$$

The dependent variable, Reliance on Law (ROL_i), is a categorical variable; it takes a value of 1 if the firm relies on the court for redress, and zero otherwise. $CE_i^{R,}$ variable is the same as in regression model (1), and assumes the form $CE_i^{Relation}$, or $CE_i^{Business}$, or CE_i^{Social}.[18] $\mathbf{FC}_i$ vector includes

[15] Heckman, J., 'Sample Selection Bias as a Specification Error'**,** *Econometrica*, Vol. 47, No. 1. (Jan., 1979), pp. 153-161

[16] The regression results for the selection stage are not reported in the paper, but are available on request.

[17] See *An Introduction to the Bootstrap (Monographs on Statistics and Applied Probability)* by Bradley Efron and R.J. Tibshirani,1998

[18] A fourth model with both $CE_i^{Business}$ and CE_i^{Social} as independent variables is considered, but not estimated because of the high correlation between the two variables reported in Table 6.

characteristic variables for firm *i*, including sales, total assets and age of the firm, but not listing and industry dummies as before. They are excluded as they were insignificant in our tests of equation (1). Note that regression equation (3) represents the outcome stage in two-stage Heckman model, and includes estimate of λ_i Heckman correction for selection bias.

Since ROL_i is a categorical variable, we perform logistic regression. As indicated above, we use *with-replacement* nonparametric bootstrapping. The method permits estimating the sampling distribution of a statistic empirically without making assumptions about the distribution of the population, and without deriving the sampling distribution explicitly. We use random-x re-sampling to select 2,000 bootstrap samples[19] from the possible set of size 29^{29}. We fit the model for each sample and note the regression coefficients. We compute the average of these coefficients and their variance. We repeat the bootstrapping process 20 times.

Table 9 presents the results of three tests based on regression equation (3). It reports the ranges for the regression coefficients and corresponding standard errors over the 20 bootstrapping exercises. In each test, ROL_i is the dependent variable. Columns 1- 3 of the table include $CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social} respectively as the independent variable of interest with control variables sales, assets, and age.

[Table 9 here]

The most striking result that emerges from the test results is the strong negative association between reliance on law and reliance on relationships for contract enforcement. In model 1, the coefficient of $CE_i^{Relation}$ is consistently and strongly negative (at 1% level) and ranges from -0.73 to -0.47. The range corresponds to a decrease in the probability of seeking legal sanction in the range 0.11 - 0.01 for the median firm in the set of the 29 firms in our sample that faced default. The results for contract enforcement with business relationships and social relationships are very similar. In columns 2 and 3 in table 9 the reported coefficients of $CE_i^{Business}$ and CE_i^{Social} are strongly negative (at 1% level). The results uniformly suggest substitution of informal channels for courts in settlement of disputes following contract failures.

In all models, the coefficients of sales and age variables are strongly positive (at 1% level). The results indicate that firms with larger sales and older firms are more inclined to use

[19] Usually 500 to 1000 bootstrap samples are sufficient for robust estimates of regression coefficients. But since we are bootstrapping logistic regression, we decided to use more re-samples.

the courts than the others firms. Note that firms that sell more have more to lose when their customers default. Further, age and sales variables are proxy for firm quality and reputation. The results suggest that firms that have more to lose, either by way of reputation or lost sales, are less enthusiastic about using relationships to resolve commercial disputes. Informal channels are more appealing for smaller and younger firms. This implication appears to be contradicted by the coefficient of total assets (strongly negative). However, the link between the size of total assets and trade credit extended is not obvious, unlike the link between sales and trade credit. In other words, the size of total assets as a control variable is not very meaningful.

As indicated above, all parameter estimates in the models are corrected for selection bias following Heckman procedure described above. Note that the coefficient of λ is significant in all models, though the sign is inconsistent across models. The results indicate that it was important to have used the Heckman procedure.

Before closing this section, we note that the strong coefficients of the indices indicating reliance on informal relationships for contract enforcement in tests of dispute settlement following a default are at a sharp contrast to the insignificance of the same indices in tests of dispute prevention in the previous section. As we have hinted in the introduction and discuss in more depth in the final section of this paper, both sets of results are consistent with sound intuition. To us, the contrast indicates that the survey responses convey meaningful information. As we know, the indices are based on responses of the firms in our survey. In other words, the responses support a hypothesis when it is warranted, and reject a hypothesis when it is not.

VII. Conclusions

The empirical findings in the present study do not support the hypothesis that informal relationships effectively deter failure of business contracts in India. Availability of informal channels, whether a business connection or a social relationship, does not prevent customer default; more credit sales actually make it more likely. We have noted above that the median firm in our sample depends on relationship-based credit for only a third of the trade credit it receives. In other words, it can conceivably default on a relational contract for goods received on credit, and seek alternative partners. As we have observed in the introduction, with well - developed capital markets the search cost for alternative partners is limited in India and the repeated-game incentives to continue existing relationships are weak. Since our sample consists

of trade credit contracts, the size of capital markets in India is an appropriate indicator of the strength of market institutions for our thesis. We have noted in section II above that that the size of the external capital markets, as measured by the sum total of bank credit and stock market capitalization in relation to GDP, is higher for India than for many developing countries.

Interestingly, we have also found that following a default many firms, especially the smaller and younger firms, prefer to rely on relationship-based channels to settle the dispute rather than seek redress in the court. We have presented a direct test where the firms faced with a breach of contract by customers/suppliers had the choice of going to the court or working the informal channels. The finding suggests substitution of informal relationships for legal institutions among the smaller firms in India when it comes to dispute resolution following a contract failure. A plausible explanation for both findings together is that, even though informal channels are not effective in deterring contract violations given relatively little market friction, seeking redress through them following a contract violation entails less transactions costs than using an ineffective legal system. In other words, while fairly strong market institutions and low search costs for alternative partners in India explain our first result, a poorly functioning legal system with its attendant high transactions costs explain the second.

As we have noted in section II of this paper, strong market institutions coupled with a weak legal system are characteristic of many other countries. Though the legal environment in India is marginally more effective than the group of sixteen other large emerging economies, the external markets are very comparable in size. We conjecture that relational contracting will be ineffective in those countries as well. However, compared to Vietnam and China, India offers similar legal effectiveness but larger capital markets. India offers more of both than the developing country groups discussed in section II. Relational contracting should have a meaningful role to play in trade and commerce in those countries.

The existing literature on the other countries is sparse. However, we note that the available evidence, limited as it is, supports our conjecture. In their study on dispute prevention without courts in Vietnam, McMillan and Woodruff (1999b) find that informal relationships are effective in contract enforcement (as we have noted above, they explicitly recognize that their finding is due in part to the poor state of market institutions in Vietnam at the time of their

study). Allen *et al* (2005)[20] document the effectiveness of networked relationships in trade and commerce in the most successful sector of the Chinese economy (non-state, non-listed firms). Biggs and Shah (2006) find that SME's in sub-Saharan Africa get around the scarcity of formal institutions by creating private governance systems in the form of tight, ethnically based, business networks. They note that network memberships are valuable "in the sparse business environment of the region". However, even in those countries, the effectiveness of relational contracting will perhaps diminish with time. McMillan and Woodruff (1999b, p. 653) make the following insightful observation: "As market institutions develop so that search costs fall, the cost of breaking a relationship will also fall and firms will become less willing to cooperate with each other. As market information improves in Vietnam, the need for workable laws of contract and courts able to enforce them will become more pressing".

India today has workable market institutions and elaborate contract laws on paper but, unfortunately, an ineffective court system. Our findings call for stronger legal institutions and stricter enforcement of contracts, since there is no effective substitute for them.

[20] "In some cases, there are no formal written contracts between the friends/investors and the entrepreneurs, implying that reputation- and relationship-based implicit contractual agreements have worked effectively", Allen et al (2005, pp. 93-94)

Appendix

1. **Test for Representativeness:** In our case, out of the 680 non-financial SMEs in the *Prowess* database for which financial information was available for at least last five years when the survey was conducted, 141 firms responded to the survey. Given that the sample firms account approximately 21% of the population, it is important to ensure that they are representative of the *Prowess* SME population. To verify this, for year 2005 (the last year before the survey was conducted), we conduct large sample mean difference tests between the sample firms and the *Prowess* SME population for important firm-specific variables, including total assets, sales, trade credit extended and received. As the table below indicates, the hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We do the same analysis for manufacturing and services firms separately, and again do not find significant statistical differences between the means except in one case where there is weak evidence of inequality (between mean sales for the sample firms in services and the corresponding population mean). We meant to extend this analysis to each industry represented in our final sample. However, the sample size in each industry is too small for the purpose.

2. **Test for Randomness:** Our sample is not a random sample, and includes firms that we were able to survey. To check whether the characteristics of the firms in our sample differ significantly from a randomly drawn sample, we carry out *non-parametric with-replacement* random sampling to generate 2,000 random samples, each of size 141, from the *Prowess* SME population. For the year 2005, we calculate the averages of the corresponding means and standard deviations of different firm-specific variables across the 2,000 random samples. For each variable, we conduct a mean-difference test between our sample firms and the average of the random samples. As the table below indicates, the hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We repeat the analysis for manufacturing and services firms separately, but the results do not change.

		Surveyed Firms (1)	*Prowess* Population (2)	Random Sample (3)	*p*-values (1)-(2)	*p*-values (1)-(3)
No. of Firms	*All*	141	680	141	N/A	N/A
Manufacturing (in %)		66.7	73.8	66.7	0.07	0.5
Services (in %)		33.3	26.2	33.3	0.39	0.5
Firm Characteristics (in Mn.$)						
Total Assets	*All*	5.31 (6.9)	4.29 (4.39)	4.27 (4.31)	0.34	0.37
	Manufacturing	4.23 (3.5)	4.06 (3.69)	4.06 (3.67)	0.73	0.8
	Services	7.5 (10.6)	5.04 (6.48)	4.93(6.01)	0.14	0.16
Total Sales	*All*	6.91 (10.4)	6.45 (17.62)	6.46 (14.87)	0.75	0.82
	Manufacturing	6.75 (7.7)	5.53 (7.9)	5.52 (7.7)	0.39	0.47
	Services	7.23 (14.58)	8.39 (31.4)	8.22 (23.5)	0.06	0.06
Trade Credit Extended	*All*	1.3 (2.7)	1.03 (1.8)	1.02 (1.7)	0.45	0.49
	Manufacturing	0.98 (1.26)	0.98 (1.42)	0.98 (1.39)	0.52	0.99
	Services	0.93 (2.28)	1.0 (2.24)	1.0 (1.93)	0.88	0.46
Trade Credit Received	*All*	1.53 (3.4)	0.84(2.23)	0.83 (1.82)	0.24	0.28
	Manufacturing	1.05 (1.52)	0.78 (1.26)	0.78 (1.21)	0.35	0.41
	Services	2.53 (5.55)	0.92 (3.79)	0.93 (2.63)	0.10	0.18

(The table reports the means of different firm characteristics and values in parentheses are standard deviations)

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Table 1: Law and Institutions in India and Other Countries

The table compares legal systems and institutions related to investor protection in India with those in several other countries (USA, Vietnam, China) and country groups (OECD, sixteen large emerging economies not including India, and five other groups of developing economies). Creditor rights scores (scale 0 – 4) are from Djankov, McLiesh and Shleifer (DMS, 2007) and Anti-director rights scores (scale 0 – 6) are from Djankov, La Porta, Lopez-de-Silanes and Shleifer (DLLS, 2008). Legal Formalism Index, from DLLS (2003), measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts. The index ranges from 0 to 7, where a higher score means greater formalism or a higher level of intervention in the judicial process. Legality Index, from Berkowitz, Pistor, and Richard (2003), ranges from 0 to 21 with a higher score indicating a better legal environment. Corruption Perception Index values, from Transparency International (2006), are based on surveys of firms in different countries on corruption the firms face in conducting business in each country. The index ranges from 0 to 10, with a higher value indicating less corruption.

	Creditor Rights	Anti-Director Rights	Legal Formalism Index	Legality Index	Corruption Perception Index
India	**2**	**5**	**3.34**	**12.8**	**3.5**
Panel A: Select Countries					
USA	1	3	2.62	20.85	7.3
Vietnam	1	N/A	3.25	N/A	2.6
China	2	1	3.41	N/A	3.3
Panel B: Country Groups Average					
OECD	1.96	3.26	3.18	20.08	7.74
Large Emerging Markets (excluding India)	1.69	3.63	4.00	10.59	3.60
Latin America & Caribbean	1.63	2.79	4.51	12.71	3.7
East Asia & Pacific	1.67	3.4	3.50	11.82	2.99
Middle East & North Africa	1.71	2	4.18	12.54	3.16
South Asia (excluding India)	1.75	4	3.59	9.69	2.89
Sub-Saharan Africa	1.41	4.33	3.31	11.87	2.95

Notes: *OECD group includes* Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, USA. *Large Emerging Markets* group includes Argentina, Brazil, China, Egypt, Indonesia, Korea (South), Malaysia, Mexico, Pakistan, Peru, Philippines, South Africa, Sri Lanka, Taiwan, Thailand, Turkey. *Latin America and Caribbean group* includes Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Cuba ,Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala ,Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Lucia, Suriname, Uruguay, and Venezuela, RB; *East Asia & Pacific group* includes, Cambodia, China, Indonesia, Kiribati, Lao PDR, Malaysia, Mongolia, Myanmar, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam; *Middle East & North Africa group* includes Algeria, Djibouti, Egypt, Arab Rep. Iran, Islamic Rep., Iraq, Jordan, Lebanon, Libya, Morocco, Syrian Arab Republic, Tunisia; *South Asia group* includes, Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka; *Sub-Saharan Africa group*

includes, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Rep. Côte d'Ivoire, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe. For some countries data for some variables was not available.

Table 2: Capital Markets in India and Other Countries

The table compares stock markets and banking sector of India with those of several countries (USA, Vietnam, China) and country groups (OECD, sixteen large emerging economies not including India, and five other groups of developing economies).. All the measures are taken from Levine (2002) or calculated from the World Bank Financial Database using the definitions in Levine (2002). We use 2005 figures for all countries.

	Bank Credit/GDP (1)	**Market Cap./GDP (2)**	**External Finance /GDP (1+2)**
India	0.37	0.60	0.97
Panel A: Select Countries			
USA	1.88	1.35	3.23
Vietnam	0.58	0.01	0.59
China	0.31	0.32	0.63
Panel B: Country Groups Average			
OECD	1.23	0.96	2.19
Large Emerging Markets (excluding India)	0.32	0.65	0.97
Latin America & Caribbean	0.39	0.37	0.62
East Asia & Pacific	0.41	0.51	0.67
Middle East & North Africa	0.37	0.76	0.78
South Asia (excluding India)	0.31	0.32	0.58
Sub-Saharan Africa	0.19	0.36	0.31

Notes: *OECD group includes* Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, USA. *Large Emerging Markets* group includes Argentina, Brazil, China, Egypt, Indonesia, Korea (South), Malaysia, Mexico, Pakistan, Peru, Philippines, South Africa, Sri Lanka, Taiwan, Thailand, Turkey. *Latin America and Caribbean group* includes Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Cuba ,Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala ,Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Lucia, Suriname, Uruguay, and Venezuela, RB; *East Asia & Pacific group* includes, Cambodia, China, Indonesia, Kiribati, Lao PDR, Malaysia, Mongolia, Myanmar, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam; *Middle East & North Africa group* includes Algeria, Djibouti, Egypt, Arab Rep. Iran, Islamic Rep., Iraq, Jordan, Lebanon, Libya, Morocco, Syrian Arab Republic, Tunisia; *South Asia group* includes, Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka; *Sub-Saharan Africa group* includes, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Rep. Côte d'Ivoire, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe. For some countries data for some variables was not available.

Table 3 Panel A: Summary of Survey Data

The table reports summary of survey responses by the 141 firms in our sample in some key dimensions, including location, industry, listing information, age, etc. The firms are classified on the basis of number of employees. The survey was conducted in year 2006. The respondents were either owners or top executives of the surveyed firms.

		Number of Employees			
	All	**0-50**	**50-100**	**100-200**	**200 and above**
No. of Firms	141	36	34	33	38
(in %)		25.5	24.1	23.4	27.0
Location					
Northern India (in %)	18.4	16.7	14.7	12.1	28.9
Eastern India (in %)	9.9	2.8	14.7	21.2	2.6
Western India (in %)	30.5	33.3	17.6	42.4	28.9
Southern India (in %)	41.1	47.2	52.9	24.2	39.5
Industry					
Manufacturing (in %)	66.7	63.9	67.6	63.6	71.1
Services (in %)	33.3	36.1	32.4	36.4	28.9
Listing Information					
Yes (in %)	75.2	77.8	67.6	78.8	76.3
No (in %)	24.8	22.2	32.4	21.2	23.7
Age (in Years)					
0-10 (in %)	7.1	5.6	5.9	9.1	7.9
10-20 (in %)	53.2	69.4	44.1	45.5	52.6
20 & above (in %)	39.7	25.0	50.0	45.5	39.5
Day-to-Day Management					
Owner/Partner (in %)	62.9	52.8	69.7	66.7	63.2
Hired Manager (in %)	37.1	47.2	30.3	33.3	36.8
Top Manager belonging to Founding Family					
Yes (in %)	66.7	61.1	68.8	62.5	73.7
No (in %)	33.3	38.9	31.3	37.5	26.3
Cases of Customer Default on Trade Credit					
Yes (in %)	20.6	13.9	32.4	36.4	2.6
No (in %)	79.4	86.1	67.6	63.6	97.4

Table 3 Panel B: Summary Statistics of Firm Characteristics

The table reports summary statistics of the firm characteristic variables for the 141 surveyed firms. The variables are used in regression models of the present study, and are based on CMIE-*Prowess* data for year 2005.

Variables	**No. of Obs.**	**Min**	**Mean**	**Median**	**Max**	**Standard**

						Deviation
Total Assets (in Mn. $)	141	0.13	5.31	3.44	46.31	6.89
Total Sales (in Mn. $)	141	0.00	6.91	2.85	76.28	10.42
Trade Credit Extended (in Mn. $)	141	0.00	1.30	0.56	24.29	2.69
Trade Credit Received (in Mn. $)	141	0.00	1.53	0.47	23.77	3.47
Trade Credit Terms (in %)	106	0.53	33.46	15.79	425.4	50.98

Table 4 Panel A: Relationship Variables from Survey Responses - Contract Enforcement

The table reports the mean response by the firms in our sample to a survey question. The survey was conducted in year 2006. The question is designed to gauge the importance a respondent attaches to informal relationships for contract enforcement. The question has nine sub-parts. For each firm, the responses to the first four parts are used in constructing the $CE^{Business}$ index, while the responses to the remaining five parts are used in constructing the CE^{Social} index. Responses to all nine parts are used in constructing the $CE^{Relation}$ index.

	Sample Mean		
Importance of the following in negotiations with suppliers/customers involving default or breach of contract (Scale: 1= not important to 5= extremely important)			
Geographic proximity of the other party	3.1	Contract Enforcement using Business Relationships $CE^{Business}$	Contract Enforcement using Relationships $CE^{Relation}$
Advocacy on behalf of other party by another business man in industry	3.2		
Met other party before in a professional setting	3.2		
Affiliation in common industry associations	3.7		
Other party related to you through extended family	2.6	Contract Enforcement using Social Relationships CE^{Social}	
Other party socially known to you	2.7		
Other party belongs to your caste	2.5		
Other party has same native language as yours	2.7		
Advocacy on behalf of other party by relative, friend or social contact	3.1		

Table 4 Panel B: Summary Statistics of Contract Enforcement Variables

The table reports the summary statistics of the variables indicating reliance on informal relationships for contract enforcement in panel A above.

Variables	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
(Scale: 1 - 5)						
$CE^{Relation}$	130	1.00	2.99	2.90	4.40	0.77
$CE^{Business}$	130	1.00	3.24	3.40	4.60	0.78
CE^{Social}	130	1.00	2.74	2.60	4.20	0.90

	Sample Mean		
Proportion of trade credit extended to following categories of customers			
The customer is located your city/town	0.065	***Proportion of credit extended to business relationships***	***Proportion of credit extended to relationship-***
You have some information on his reliability through industry sources	0.064		
You have met him before in a professional setting	0.064		

Table 5 Panel A: Relationship Variables from Survey Responses - Credit Extended and Received

The table reports the mean response by the 141 firms in our sample to two survey questions. The survey was conducted in year 2006. The questions are designed to estimate the proportion of total credit sales to relationship-based customers and proportion of total credit received from relationship-based suppliers.

The customer is related to you through your extended family	0.045	***Proportion of credit extended to social relationships***	***based customers***
The customer is socially known to you	0.055		
The customer belongs to your caste	0.054		
The customer has the same native language as yours	0.054		
Proportion of trade credit received from following categories of suppliers			
The supplier is located in your city/town	0.067	***Proportion of credit from business relationships***	***Proportion of credit from relationship-based suppliers***
You have some information on his reliability through industry sources	0.069		
You have met him before in a professional setting	0.064		
The supplier is related to you through your extended family	0.041	***Proportion of credit from social relationships***	
The supplier is socially known to you	0.054		
The supplier belongs to your caste	0.051		
The supplier has the same native language as yours	0.055		

Table 5 Panel B: Summary Statistics of Credit Extended and Received Variables: Proportions

The table reports summary statistics of the credit extended and received variables in panel A above. The proportions are computed using the simple additive method (see section IV of text).

Table 5 Panel C: Summary Statistics of Credit Extended and Received Variables: Volume (Mn. $)

The table reports the summary statistics of the dollar value of credit extended and received variables in panel B above. $TCX^{Relation,}$ $TCX^{Business}$, and TCX^{Social} are products of trade credit extended from *Prowess* and proportion of credit extended to relationships from panel B above. Similarly, $TCR^{Relation,}$ $TCR^{Business}$, and TCR^{Social} are products of trade credit received from *Prowess* and proportion of credit received from relationships from panel B above

Variables	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
$TCX^{Relation}$	137	0.00	0.67	0.18	21.66	2.11
$TCX^{Business}$	137	0.00	0.70	0.19	24.29	2.33
TCX^{Social}	137	0.00	0.53	0.12	16.19	1.63
$TCR^{Relation}$	124	0.00	0.71	0.13	21.20	2.26
$TCR^{Business}$	124	0.00	0.70	0.13	16.80	2.21
TCR^{Social}	124	0.00	0.71	0.12	23.77	2.37

Variables (Scale: 0 to 1)	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
Proportion of credit extended to relationships	138	0.08	0.41	0.33	1.00	0.26
Proportion of credit extended to business relationships	138	0.03	0.20	0.16	0.46	0.12
Proportion of credit extended to social relationships	138	0.04	0.21	0.17	0.65	0.16
Proportion of credit from relationships	125	0.08	0.40	0.32	1.00	0.25
Proportion of credit from business relationships	125	0.03	0.20	0.16	0.46	0.12
Proportion of credit from social relationships	125	0.04	0.20	0.12	0.54	0.15

Table 6: Correlation Matrix

The table presents the correlations between default frequency variables ($D_i^{Relation}$, $D_i^{Business}$, and D_i^{Social}), contract enforcement using relationships variables ($CE_i^{Relation}$, $CE_i^{Business}$, and CE_i^{Social}), variables indicating the amount of trade credit extended in relationships ($TCX_i^{Relation}$, $TCX_i^{Business}$, and TCX_i^{Social}), and trade credit terms (TCT_i). The default frequency variables indicate the frequency of default faced by firm *i* in our sample on relationship – based credit. The variables are discontinuous, with a value between 0 and 1, reflecting the exposure of a firm in our sample to default on relationship – based credit, and zero otherwise. The exposure is measured by the proportion of total credit extended to relationship – based customers. The contract enforcement variables are from table 4A, the trade credit extended variables are from table 5C, and credit terms are from table 3B above. The default frequency and trade credit extended variables used in computing the correlations reported in the table are based on base-case proportions of total credit (see section IV of text).

	$D^{Relation}$	$D^{Business}$	D^{Social}	***CE*** ^{Relation}	***CE*** ^{Business}	***CE*** ^{Social}	***TCX*** ^{Relation}	***TCX*** ^{Business}	***TCX*** ^{Social}	***TCT***
$D^{Relation}$	1									
$D^{Business}$	0.98***	1								
D^{Social}	0.97***	0.92***	1							
CE ^{Relation}	0.21**	0.24***	0.16*	1						
CE ^{Business}	0.20**	0.21**	0.17**	0.91***	1					
CE ^{Social}	0.19**	0.24***	0.12	0.94***	0.70***	1				
TCX ^{Relation}	0.23***	0.20**	0.25***	0.34***	0.31***	0.32***	1			
TCX ^{Business}	0.21**	0.21***	0.20**	0.42***	0.36***	0.41***	0.97**	1		
TCX ^{Social}	0.23***	0.18**	0.28***	0.23***	0.22**	0.20**	0.96***	0.86***	1	
TCT	0.27***	0.24**	0.29***	-0.01	-0.02	0.01	-0.16	-0.13**	-0.19*	1

*: significant at 10%; **: significant at 5%; ***: significant at 1%;

Table 7: Informal Relationships and Contract Enforcement – Dispute Prevention

Panel A of the table reports two – sided *TOBIT* regression results of the following generic equation:

$$D_i^R = \beta_0 + \beta_1 CE_i^R + \beta_2 TCX_i^R + +\mathbf{FC}_i\beta + \nu_i \ldots\ldots \quad (1)$$

The dependent variable (D_i^R), default on trade credit contracts faced by firm *i* in our sample, changes depending on the type of credit: $D_i^{Relation}$ for relationship-based credit, $D_i^{Business}$ for business relationship-based credit, and D_i^{Social} for social relationship-based credit. It is a discontinuous variable, with a value between 0 and 1 reflecting the exposure of a firm in our sample to defaults by relationship-based customers, and zero otherwise. CE_i^R represents indices indicating reliance on relationships for contract enforcement. Depending on the particular relationship, it is $CE^{Relation}$, or $CE^{Business}$ or CE^{Social}. Similarly, TCX_i^R represents trade credit extended in relationships and, depending on the relationship, is $TCX^{Relation}$, or $TCX^{Business}$, or TCX^{Social}. The **FC*i*** vector includes a set of characteristics for firm *i* in the sample, including total assets, sales, firm age and two control dummies: Industry and Listing. All regressions are with constant; constant coefficient is not reported. Standard errors are reported in brackets.

Panel B of the table reports two – sided *TOBIT* regression results of equation (1) above augmented with TCT_i , credit terms offered by firm *i*, as an additional regressor.

$$D_i^R = \beta_0 + \beta_1 CE_i^R + \beta_2 TCX_i^R + \beta_3 TCT_i + \mathbf{FC}_i\beta + \nu_i \qquad (1')$$

To check endogenity/ simultaneity of equation (1), we predict RCE_i variables using following regression model:

$$CE_i^R = \beta_0' + \beta_1' D_i^R + \beta_2' TCR_i^R + \mathbf{FC}_i\beta' + \nu_i' \quad \ldots\ldots \qquad (2)$$

In (2) TCR_i^R is used in place of TCX_i^R for exact identification of equation (1) and equation (2). TCR_i^R represents, depending on the test, $TCR^{Relation}$ or $TCR^{Business}$ or TCR^{Social}. The Wald test statistic and *p*-value for exogenity of equations (1) and (2) are reported at the bottom of panels A and B respectively,

PANEL A				PANEL B		
	$D_i^{Relation}$	$D_i^{Business}$	D_i^{Social}	$D_i^{Relation}$	$D_i^{Business}$	D_i^{Social}
Reliance on Informal Relationships for Contract Enforcement						
CE ^{Relation}	0.07			0.12		
	[0.125]			[0.131]		
CE ^{Business}		0.13			0.12	
		[0.121]			[0.119]	
CE ^{Social}			0.01			0.07
			[0.093]			[0.107]
Trade Credit Extended in Informal Relationships $^{\#}$						
TCX ^{Relation}	1.63**			2.04**		
	[0.793]			[0.819]		
TCX ^{Business}		1.63**			1.83***	
		[0.685]			[0.666]	
TCX ^{Social}			1.62*			2.14**
			[0.839]			[0.914]
Price						
Trade Credit Terms				0.47***	0.45***	0.40***
				[0.162]	[0.148]	[0.147]
Firm Characteristics						
TOTAL ASSETS ^{a}	0.13	0.12	0.11	0.11	0.125	0.126
	[0.135]	[0.133]	[0.116]	[0.138]	[0.128]	[0.123]
SALES ^{a}	-0.207*	-0.207*	-0.174*	-0.23**	-0.241**	-0.239**
	[0.120]	[0.116]	[0.104]	[0.128]	[0.114]	[0.118]
AGE ^{a}	-0.02	-0.04	-0.01	0.07	0.039	0.066
	[0.179]	[0.177]	[0.153]	[0.177]	[0.165]	[0.159]
LISTING DUMMY ^{b}	-0.21	-0.23	-0.17	-0.09	-0.136	-0.055
	[0.247]	[0.241]	[0.214]	[0.251]	[0.232]	[0.227]
INDUSTRY DUMMY ^{c}	0.08	0.07	0.05	-0.01	-0.041	-0.012
	[0.200]	[0.195]	[0.172]	[0.204]	[0.189]	[0.184]
Observations	120	120	120	98	98	98
Pseudo R^2	0.06	0.08	0.06	0.14	0.15	0.14
Wald Statistics for exogenity of equations (χ^2)	0.03	0.21	0.07	0.37	1.06	0.01
p-value	0.86	0.64	0.80	0.54	0.30	0.91

*: significant at 10%; **: significant at 5%; ***: significant at 1%; #: Scaled by Total Assets; ^{a}: Here we have used Log (1+Total Sales), Log (Total Assets) and Log (1+ Age), ^{b}: 1=Listed and 0= Unlisted, $^{c:}$ 1:=Manufacturing and 0= Services

Table 8: Informal Relationships and Contract Enforcement – Dispute Prevention Robustness Test

The table reports robustness checks on the results reported in Table 7 before. We recalculate default frequency variables ($D_i^{Relation}$, $D_i^{Business}$, D_i^{Social}) and credit extended variables ($TCX^{Relation}$, $TCX^{Business}$ *and* TCX^{Social}) with transformed proportions of credit extended to relationships (see text section IV). Panels A and B of the table report two – sided *TOBIT* regression results of equations (1) and (1′) respectively with recalculated variables. Wald test statistics and *p*-values for exogeneity of the two equations are reported at the bottom of the panels.

PANEL A				PANEL B		
	$D_i^{Relation}$	$D_i^{Business}$	D_i^{Social}	$D_i^{Relation}$	$D_i^{Business}$	D_i^{Social}
Reliance on Informal Relationships for Contract Enforcement						
$CE^{Relation}$	0.08			0.13		
	[0.125]			[0.137]		
$CE^{Business}$		0.12			0.10	
		[0.116]			[0.134]	
CE^{Social}			0.01			0.10
			[0.096]			[0.103]
Trade Credit Extended in Informal Relationships #						
$TCX^{Relation}$	1.61**			2.00**		
	[0.783]			[0.845]		
$TCX^{Business}$		1.49*			2.16**	
		[0.792]			[0.916]	
TCX^{Social}			1.69**			1.78**
			[0.692]			[0.694]
Price						
Trade Credit Terms				0.46***	0.42**	0.43***
				[0.170]	[0.162]	[0.149]
Firm Characteristics						
TOTAL ASSETS [a]	0.138	0.104	0.133	0.113	0.105	0.09
	[0.136]	[0.124]	[0.129]	[0.152]	[0.146]	[0.133]
SALES [a]	-0.215*	-0.188*	-0.196*	-0.236*	-0.230*	-0.19
	[0.121]	[0.110]	[0.112]	[0.141]	[0.137]	[0.121]
AGE [a]	-0.008	-0.009	-0.018	0.07	0.075	0.049
	[0.179]	[0.163]	[0.172]	[0.185]	[0.178]	[0.165]
LISTING DUMMY [b]	-0.226	-0.18	-0.251	-0.116	-0.077	-0.13
	[0.249]	[0.226]	[0.239]	[0.264]	[0.255]	[0.234]
INDUSTRY DUMMY [c]	0.086	0.054	0.072	0	-0.015	-0.008
	[0.201]	[0.181]	[0.193]	[0.215]	[0.205]	[0.193]
Observations	119	119	120	97	97	98
Pseudo R^2	0.06	0.07	0.06	0.14	0.14	0.15
Wald Statistics for exogenity of equations (χ^2)	0.60	0.69	0.28	0.11	0.04	0.11
p-value	0.43	0.40	0.59	0.74	0.84	0.73

Note: Compared to table 7, table 8 has one observation less in columns 1 and 2 of both panels A and B. The response for one firm in respect of one type of business relation is not available. The non-response is ignored (coded as zero) in computing base-case proportions used in Table 7.However, the weighting matrix used in transforming the proportions that are used in Table 8 require specific responses.

*: significant at 10%; **: significant at 5%; ***: significant at 1%; #: Scaled by Total Assets; [a]: Here we have used Log (1+Total Sales), Log (Total Assets) and Log (1+ Age), [b]: 1=Listed and 0= Unlisted, [c:] 1:=Manufacturing and 0= Services

Table 9: Informal Relationships and Contract Enforcement – Dispute Settlement

The table reports *LOGIT* regression results of the following generic equation:

$$ROL_i = \beta_0 + \beta_1 CE_i^R + \mathbf{FC}_i\beta + \sigma\hat{\lambda}_i + \epsilon_i \qquad \ldots. (3)$$

The dependent variable is a categorical variable, taking value 1 for the firms who rely on courts for settling disputes following customer(s) default, and zero otherwise. CE_i^R represents indices indicating reliance on relationships for contract enforcement. Depending on the particular relationship, it is $CE^{Relation}$, or $CE^{Business}$ or CE^{Social}.. $\mathbf{FC}_i$ vector includes characteristic variables for firm *i*, including sales, total assets and age of the firm. The results in the table report the outcome stage of the two-stage Heckman model. λ represents Heckman correction for selection bias in the first stage. Due to small sample size we use random-*x* re-sampling to select 2,000 bootstrap samples and fit the model for each sample. We compute the average of the coefficients and their variances of the 2,000 samples. We repeat the bootstrapping process 20 times. The range for coefficients and deviance over the 20 processes is reported below for each model. The corresponding range for standard errors is reported in brackets. All regressions are with constants; constant coefficients are not reported.

	1	**2**	**3**
Reliance on Informal Relationships for Contract Enforcement			
***CE*^{Relation}**	-0.73 to -0.47 *** [0.063 to 0.064]		
***CE*^{Business}**		-0.43 to -0.32*** [0.04 to 0.03]	
***CE*^{Social}**			-0.10*** to 0.01 [0.01 to 0.01]
Firm Characteristics			
SALES [a]	0.23 to 0.30 *** [0.02 to 0.019]	0.18 to 0.26 *** [0.01 to 0.02]	0.06 to 0.11*** [0.02 to 0.01]
TOTAL ASSETS [a]	-0.28 to -0.20 *** [0.025 to 0.024]	-0.24 to -0.11 *** [0.02 to 0.03]	-0.02 to 0.04* [0.02 to 0.02]
AGE [a]	0.51 to 0.59 *** [0.038 to 0.035]	0.52 to 0.73 *** [0.04 to 0.05]	0.58 to 0.74*** [0.04 to 0.03]
Lambda hat $(\hat{\lambda})$	-0.70 to -0.15 ** [0.18 to 0.17]	0.92 to 1.17** [0.08 to 0.09]	0.53 to 0.93** [0.14 to 0.13]
Deviance	9.69 to 10.17	9.46 to 9.77	9.7 to 9.96
No. of Observations	Range for parameter estimates being reported for 20 different sets of 2000 samples		

*: significant at 10%; **: significant at 5%; ***: significant at 1%; [a]: Here we have used Log (1+Total Sales), Log (Total Assets) and Log (1+ Age).

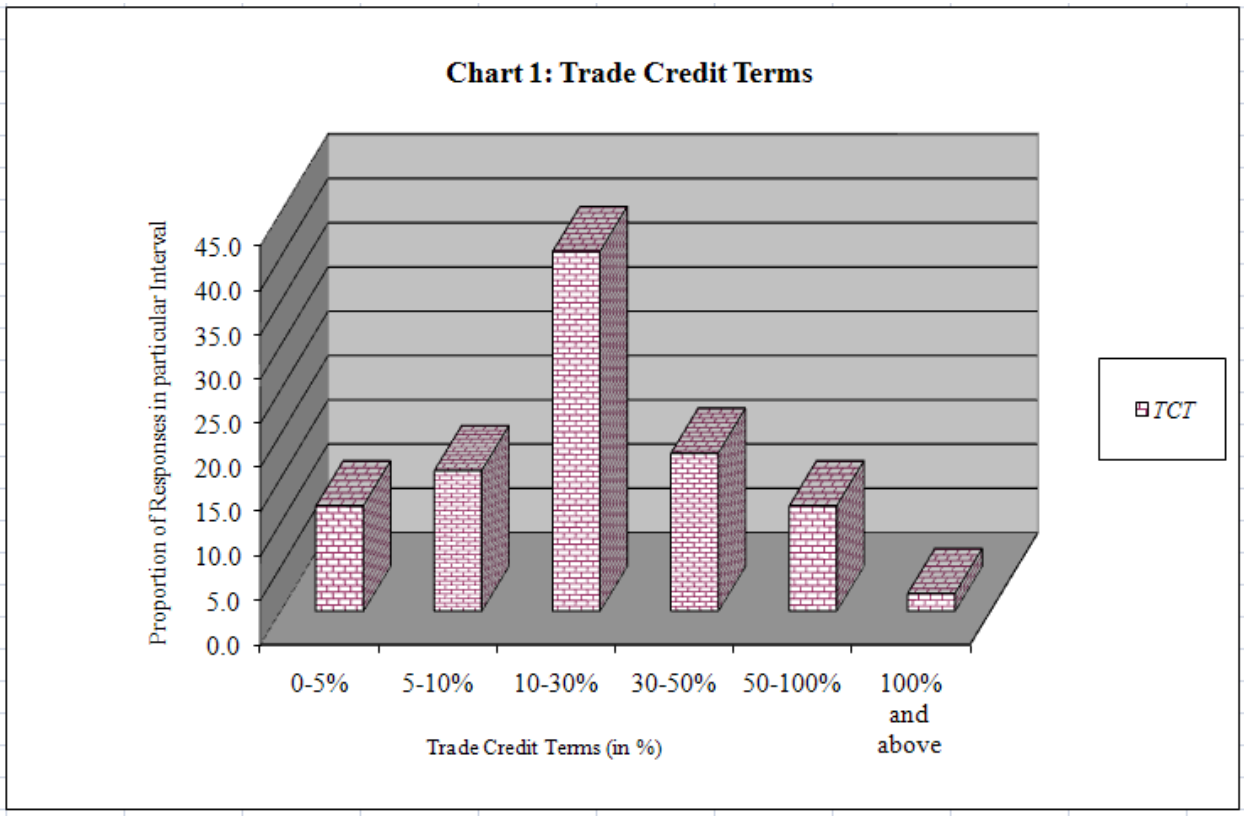
Chart 1: Trade Credit Terms
Proportion of Responses in particular Interval
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0-5%
5-10%
10-30%
30-50%
50-100%
100% and above
Trade Credit Terms (in %)
TCT

Figure 1: Law, Institutions and Capital Markets: Comparison of India and other countries

The plot below shows the size of Capital Markets and Legal Formalism Index, averaged over different country groups. **Size of Capital Markets:** Sum of the ratios of (private) bank credit and market capitalization to GDP, for Year 2006 *Source:* A New Database on Financial Development and Structure, (updated May,2009)- Thorsten Beck , Asli Demirguc-Kunt and Ross Eric Levine. **Legal Formalism Index:** The index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts, and is formed by adding up the following indices: (i) professionals vs. laymen, (ii) written vs. oral elements, (iii) legal justification, (iv) statutory regulation of evidence, (v) control of superior review, (vi) engagement formalities, and (vii) independent procedural actions. *The index ranges from 0 to 7, where 7 means a higher level of control or intervention in the judicial process.* **Source:** "Courts" (S. Djankov, R. La Porta, and F. Lopez-de-Silanes, A. Shliefer), *Quarterly Journal of Economics*, May, 2003.