Understanding Informal Financing

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Abstract

This paper offers a unified framework to understand informal financing. We explore various sources of informal financing based on their mechanisms to deal with asymmetric information and enforcement and examine their role in supporting firm growth. We find that constructive informal financing such as trade credits and family borrowings that rely on information advantages or an altruistic relationship is associated good firm performance. Underground financing such as money lenders who use violence for enforcement is not associated with firm growth. Furthermore, constructive informal financing is prevalent in regions where access to bank loans is extensive, while its role in supporting firm growth decreases with the availability of bank loans. Finally, we find that similar relations exist in many large or fast growing emerging economies. Overall, the empirical results in this paper not only reconcile the contradictory evidence in the existing literature on the role of informal financing, but also suggest formal and informal financing can be complements as well as substitutes.

JEL G21, G30, O16, O17
Keywords: Informal financing, asymmetric information, social collateral, firm growth.

1. Introduction

A strand of literature has debated the role of informal financing in supporting firm and economy growth. For example, Allen, Qian, and Qian (2005) (AQQ 2005 hereafter) argues that informal financing has supported the growth of private sector in China as the driving force of China's phenomenal economic growth. Fisman and Love (2003) show that in countries with less developed financial intermediaries, industries that are more dependent on the substitute of trade credit, grow relatively more rapidly. Cull, Xu, and Zhou (2009) and Ayyagari, Demirguc-Kunt and Maksimovic (2010) (ADM 2010 hereafter), on the other hand, suggest that there is no or limited role played by the informal financing in firm growth in China. The practical experiences are also mixed: Wenzhou, a symbolic city for China's economy boom, has been referred to both as a successful and as an unsuccessful example of relying on informal financing.

Despite extensive discussions in the literature, the term "informal finance" has been only vaguely defined by referring to a variety of financing sources apart from banks and stock markets. It includes but is not restricted to: trade credit, interpersonal borrowing (money from friends or families), private money houses, pawnshops, community cooperatives, etc. (Tsai 2004). These broadly defined sources exist and play roles respectively in specific institutional environments or at specific economic development stages. They also possibly rely on different mechanisms, and hence achieve different results.

Our paper aims to take a detailed and deep look into this type of finance, to unbundle the various informal financing sources, and to understand their mechanisms and effectiveness in promoting economy growth in a general and unified framework. Admittedly, there is a large strand of literature that extensively discusses how each individual form of informal financing works, such as trade credits and family borrowing. Our paper takes a different approach: in

unbundling informal financing, we actually group individual forms by the common mechanism through which they overcome the frictions that impede formal finance.

For a financing channel to play an effective role, it needs to overcome asymmetric information in pricing, monitoring risk, and recourse in case of default. Banks/markets' failure in these dimensions for SMEs leads to inadequate financing for them. The theoretical work on informal financing typically assumes that the informal sources (investors) have superior information through business relations or social networks to help monitoring and enforcement, and hence reduce moral hazard and/or adverse selection problems.[2] In particular, those based on social networks often involve an altruistic relationship in addition (Lee and Persson 2012). However, there are also informal financing sources that are not confined to direct business or social relations, but possibly to an indirect and much broader network, e.g, lending agencies or loan brokers working for underground financial institutions. These institutions may charge high interest and fees to cover the extreme risk in their business. Therefore, in the first step of the analysis, we classify informal financing into two types based on whether there exists an information advantage to overcome frictions.

We define constructive informal financing as those transactions that derive their information and enforcement technology from business or social relationships, mainly trade credits and family borrowing. These types of financing typically aim at supporting business operations, use business or social relationships to reduce asymmetric information and to assist collection, recovery or recourse. The pricing of such loans considers the credit worthiness, collateral usage, and risk of production and recovery. For example, Biais and Gollier (1997) and Peterson and

[2] For information advantage, there are studies by Stiglitz(1990), Varian(1990), Banerjee, Besley, and Guinnane (1994), and Jain (1999). For risk assessment, there are studies by Mookherjee and Png (1989), Prescott (1997), and Gine (2011). Finally, for reducing adverse selection, there are studies by Ghatak(1999) etc.

Rajan (1997) argue that trade credit can solve the asymmetric information problem associated with bank financing, which precludes small or young firms from bank credits, because usage of trade credits incorporates private information between suppliers and their customers.

Underground financing, on the other hand, we define as being transactions where there is no superior information advantage and which may rely on a network only in a loose sense. These financings are often made to speculative activities, charge extremely high interest rates or fees, and employ violence rather than rational recourse to collect payments or renegotiate in the case of delinquency. In terms of pricing, contract, and enforcement, these financing channels operate within a grey area or beyond legal boundaries, e.g., loan sharks.

There are also informal sources that are hard to classify unconditionally, for example, rotating savings and credit associations (Besley, Coate, and Loury 1993). These group lending methods increase members' welfare under certain conditions but may have a negative implication on social relationships, including violence in some circumstances (Montgomery 1996 and Ghatak and Guinnane 1999).

Using the World Banks' survey on SMEs, we empirically examine the role of each category above in supporting firm and economy growth. We choose Chinese firms as our primary sample because the literature's controversy regarding the role of informal financing mainly comes from China, and also because there are a variety of informal financing practices in China. Nevertheless, we use the international sample to verify that the Chinese example is not an outlier and our approach of categorizing informal financing is applicable to other countries.

Admittedly, financing and firm growth is endogenous. We address this issue by applying both a Heckman approach and a propensity score matching method. In the former approach, we control for selection bias in examining the finance and growth relation. In the latter approach,

taking firms that actually use a particular financing source as the treatment sample, we match each treatment firm with a controlling firm that has the same propensity to use this source but factually does not. We then draw the inference about financing-growth relation within the matched sample.

We find that constructive informal financing is positively associated with firm growth but underground financing is not. In many countries, underground financing is actually negatively associated with firm growth. Furthermore, constructive informal financing is prevalent in regions where access to bank loans is extensive, but its role in supporting firm growth may decrease with the expansion of bank loans.

Our classification of informal financing and evidence on their respective roles in supporting firm growth not only offer empirical support to the large strand of theoretical literature that emphasizes superior information and monitoring technology in explaining the popularity of informal financing, but also reconcile the contradictive evidence in the empirical literature on the economic role of informal financing. In particular, while AQQ (2005) document informal financing as the driving force in supporting the private sector in China; ADM (2010) show that bank financing, not informal financing, is associated with growth of Chinese firms. We reconstruct ADM (2010)'s key tables but differentiate constructive informal financing from underground financing. We find that the constructive informal financing is positively associated with firm growth.[3]

[3] Another data treatment issue that drives the different results in AQQ (2005) and ADM (2010) is how the unidentified sources "other" are labeled. AQQ (2005) treat them as part of informal financing since all the formal sources have been exhausted in the grouping. ADM (2010) however treat it as internal financing, possibly due to the reason that this treatment will bring the internal financing level comparable to other countries. In our paper, we exclude the "other" from analysis since the sources hence the mechanisms are not identified.

Our findings also shed light on the debate in the literature: whether firms use informal financing as a second-best choice when formal financing is unavailable or prefer a particular source due to specific firm conditions. Though our paper does not address this question directly, our mechanism-based classification provides a framework that makes informal financing and bank financing more comparable. As both sources rely on agents' sophistication in dealing with asymmetric information, monitoring, and recourse effectively, the development of constructive informal financing and bank finance are complementary. Consistent with this premise, we show that firms operating in regions with extensive bank loan access have prevalent access to constructive informal financing.

Studies on China's financial system reform debate whether government's ban on some informal financing in the 1990s was politically or economically driven. Our mechanism-based approach offers a benchmark to evaluate relevant propositions.

Finally, our empirical analyses with the international sample suggest that the mechanism-based approach is applicable to other economies. The general lesson is that information acquisition and enforcement capacity play key roles for financial intermediaries to work regardless of specific formality. While banks use collateral to reduce risk, suppliers who lend to client firms can use their implicit equity stake in the firms to provide protection. Broadly speaking, the effect of financial intermediation depends on its underlying information mechanism rather than its formality.

The reminder of the paper is organized as follows. In Section 2, we discuss various sources of informal financing, the mechanisms they rely on, and the role they play in supporting firm growth. Section 3 introduces the data. Section 4 presents the empirical results. Section 5 conducts robustness checks in international sample. Section 6 concludes the paper.

2. Informal financing mechanisms and classification

The role of financial intermediaries such as banks and the direct financing equity markets is to bridge between those with a surplus and those with a deficit of capital. However, asymmetric information between banks/markets and firms may preclude financing for valuable projects. The asymmetric information problem is particularly severe for small firms, firms without bank relationships, and during credit tightening periods. It is also particularly severe in developing countries that usually have less developed financial systems, inadequate business laws, and insufficient intermediary service. For example, Brandt and Li (2003) show that private firms are significantly less likely to obtain loans, subject to higher loan standards, and receive smaller loans, consequently more likely to resort to trade credit financing compared to large firms.

China provides a rich paradigm to study informal finance: development of the financial system lags behind the fast growing economy, which nurtured millions of small firms that are usually discriminated against by banks and financial markets. Both government policies and empirical evidence shows that banks prioritize state-owned firms in terms of credit allocation. The rationales for banks to bias against private sector include the state ownership of banks, asymmetric information between banks and private firms, and lack of sound accounting practices, credit evaluation methods, or protection on contract enforcement. To overcome financing constraints, private firms in China have widely adopted many alternative financing sources.

Tsai (2004) is one of the pioneering works on informal financing in China. Through rich field interviews, she documents a broad set of informal sources used by Chinese entrepreneurs: interpersonal lending, trade credits, money lenders, loan sharks, rotating savings, credit organization, pawnshops, indigenous banks, money houses, mutual assistance societies, etc.[4] She

[4] We borrow one example from Tsai (2004) about an owner of a factory with more than 30 employees, in Zhejiang province. Owner Lin never borrowed from formal sources, as he said, "It's not worth it to me to apply for a loan

also documents many anecdotal stories on how informal financing is used to support entrepreneurship. She differentiates these informal sources mainly along the legal boundary. For example, interpersonal lending and trade credit, the most basic strategies that entrepreneurs use to satisfy short liquidity needs, are legal because the interest rate does not exceed the government required ceiling[5]. In contrast, loan sharks and private money houses charge much higher interest rate or fees and are regarded as illegal by the People's Bank of China. Some informal sources' legal status varies over time and across regions. For example, rotated saving was once a praised practice in rural China but now is banned in most Chinese cities. Some pawnshops are legally registered, while some others are registered with non-financial regulators and may or may not engage in illegal lending practices.

We want to classify informal financing sources, ex-ante, based on the mechanisms they rely on. This is because the effectiveness of these informal sources in supporting firm operation largely depends on how they overcome the asymmetric information. The mechanism they use should correspondingly address the moral hazard and adverse selection problems that drive away formal financing away in the first place.

Adopting four criteria: (a) information technology; (b) monitoring and risk control; (c) pricing risk; and (d) recourse mechanism in case of delinquency, we classify informal financing into two categories. The first category, namely constructive informal financing, includes trade

from a state bank or rural credit cooperative because the credit officers are dirty and rip me off given my family background. If I applied for a 100,000 RMB (US$12,000) loan, I would only receive 60,000 RMB (US$7,200) because the credit officer would pocket the other 40,000 RMB (US$4,800). Meanwhile, I would still be expected to pay interest on 100,000 RMB". Lacking official connections thus less interested in formal finance, Owner Lin managed to invest 700,000 RMB (US$84,000) in his motorcycle parts factory by using 100,000 RMB (US$12,000) of his own savings, borrowing 200,000 RMB (US$24,000) interest free from his four older siblings, and borrowing 400,000 RMB ($48,000) at 24% annual interest through moneylenders. The latter loans were guaranteed by his sisters who have good credit among moneylenders in the textile sector.

[5] By the law established by Chinese Supreme Court and enacted since Aug 1991, the ceiling of the interest rate is four times the rate for a similar bank loan.

credit, small Loan companies, banks' credit extension arms, registered pawnshops or financing companies, direct and informed lending between direct family member and close relatives. These informal sources use personal, community, or business relationships to reduce asymmetric information and reduce risk through economic collateral. The price of funding reflects both the risk and the closeness of the relationship – the value of social bonding. In case of delinquency or default, there are sufficient economic and social connections that facilitate renegotiation and resolutions.

The other category, namely underground financing, includes loan sharks, unregistered pawnshops, lending agencies and loan brokers. These informal sources have little information technology to rely on: they are less concerned about the risk of project, even less to monitor or control risk. The pricing of loans is usually fixed at a predatory high rate. In case of delinquency, violence maybe used to force payment. We present the categorization in table 1.

[Insert table 1 about here]

Given that regulators concern with the social impacts of informal financing institutions, our classification is naturally correlated with these financing channels' legal status and lending targets: the constructive sources are often legally permitted and target entrepreneurship activities. Underground sources on the other hand are often illegal and target speculative activities such as gambling. However, our mechanism-based approach is still distinct from legality. For example, some of the legally registered pawnshops may lend to gamblers rather than entrepreneurs. The ex-ante criterion to tell the difference is not their legal status rather their economic activities and composition of the clients. Another example is credit cooperatives such as rotation savings, credit organizations, rural cooperative foundations, and mutual benefit funds that existed in China till late 90s. These indigenously organized informal institutions played an extremely

important role in the early stage of the China's reform especially in transiting the rural households from agriculture to entrepreneurship (Qian and Huang 2011). However, they were declared to be illegal by People's Bank of China in late 90s and banned from practice. Despite their declared illegal status, if financing in these forms were identified, our classification rule would label them constructive informal financing because of their relationship based nature, their purpose to support entrepreneurship, and their mutual monitoring mechanism to reduce risk and facilitate recourse.

Our mechanism-based classification offers a general framework to understand informal financing. Applying this unified framework, we can identify constructive informal financing in different information environments: Although their specific form may change over time or across countries, the essential mechanisms share similarities. This approach predicts ex-ante whether a specific informal source fills the financing gap for SMEs and supports economic growth effectively by verifying whether this source has a mechanism to address informational issues -- the difficulty in information production and risk control that cause formal financing through banks and markets to fail. On the other hand, financing sources that fail these measures are not likely to have any positive effect on firm performance. In what follows, we empirically test the above hypothesis using survey data on Chinese SMEs.

3. The Data

3.1 The survey

We use the same survey data for Chinese firms as in ADM (2010). This World Bank Investment Climate survey was undertaken in early 2003 in collaboration with the Enterprise Survey Organization of the Chinese National Bureau of Statistics. It is part of the World Bank

Enterprise Surveys which use standardized survey instruments and a uniform sampling methodology to investigate the investment climate of countries across the world. The Enterprise Surveys sample from the universe of registered businesses following a stratified random sampling methodology in each country.

The Chinese survey covers 2,400 firms from 18 cities that are representative of a wide range of regions in China. The firms are randomly selected from both manufacturing and services industries with a restriction on minimum firm size measured by the number of employees. The minimum number of employees was set at 20 for manufacturing firms, and at 15 employees for services firms.

There are two sections of survey questionnaires. The first section asks for general information about the firm, its relations with clients, suppliers and government, and the manager's opinion on the business environment. The general information allows us to identify firms' registration status: state owned companies (SOEs), incorporated, collectives or cooperatives, and other legal structures; ownership structure: domestic or foreign; and detailed percentage owned by individuals, managers, institutional investors, firms and banks.

The second section is based on interviews with the firm's accountant and personnel manager and asks for balance sheet information and other quantitative information on employee training, schooling, and wages. While most of the qualitative questions pertain only to the year 2002, a short panel from 1999 to 2002 is available for the quantitative questions.

On the firms' financing situation, the interviewees are asked to identify various sources that finance firms' working capital and new investment respectively and the proportionate contribution of each source. The financing sources include: state-owned commercial banks, other commercial banks, urban credit cooperatives, rural credit cooperatives, foreign-owned

commercial banks, trade credits from suppliers or customers, investment funds, special development funds, state services; retained earnings; loans from family and friends, moneylenders, informal banks, sales of stock to the management or legal persons, public issue of marketable shares to outside investors, and other unidentified sources. The interviewees indicate the percentage of each source over the total funding used. These percentages add up to 100% for working capital and new investment respectively.

3.2 Sample descriptions

We describe the sample firms in table 2. Sample firms are mostly small with average total assets of 24.49 million USD (median of 2 million USD) in year 2002 (USD/CNY8.28 in 2002). They are highly leveraged with debt/equity ratio mean at 5.24 or median at 1.1. Although small, they are not necessarily start-ups, because the sample mean age is 16 years (median 10 years). 40% of the sample firms are incorporated and a quarter of them are state controlled. They grow fast, with mean log(sales) growth from 1999 to 2002 of 34.28% or median of 7.13%.

Only 24% of the sample firms have borrowed from banks. Based on the survey answers, the application process is extremely inefficient. For long-term bank loans, it takes on average 42 days from filing the application to being able to withdraw funds.

[Insert table 2 about here]

3.3 Group of informal financing sources

We group the trade credits and personal lending as constructive informal financing, because they use social or business relationships to reduce asymmetric information. In case of delinquency and default, the social collateral and implicit stake arising from business transactions serve natural mechanisms for renegotiation and restructure solutions. In both channels, reputation arising from repeated games can also serves as a risk-reducing mechanism.

We use the "other informal" item to measure underground financing. Presumably, money lenders, pawnshops, and informal banks are all in this group. As we discussed in section 2, while some of these sources are illegal and destructive, some others actually work in a constructive way. Since the survey does not differentiate between them, we can only take them all in the underground financing in our empirical analysis. This treatment will create a bias against us to find distinctive roles between constructive informal financing and underground financing. In other words, our results would be stronger if we could tell them apart.

Even though the survey questionnaires exhaust various financing resources that World Bank surveyors are aware of, the largest financing component (37%~42%) for Chinese firms is still unidentified "other" sources. In ADM (2010), this component is put in internal financing and in AQQ (2005), informal financing. Based on our field experiences, these sources include but are not limited to informal financial institutions that operate beyond China's current regulatory boundary, such as the cooperatives and credit organizations that are banned by the central bank. These sources may or may not use constructive mechanisms. They may also include sources that are specified in the questionnaire but the entrepreneurs simply do not want to disclose, or may be misclassifications. Unable to identify the source and the corresponding working mechanisms, we treat them neither as internal financing nor as informal financing in the analysis.

While ADM (2010) use only observations on working capital financing, we investigate both working capital and new investment in new land, buildings, machinery and equipment. We are particularly interested in the new investment category, because it is much more striking to use informal financing to support long-term investment than for operational purposes. For example, Lee and Person (2012) suggest that family borrowing may be only used in less risky projects, as entrepreneurs do not want to impose excess risk on families which carry other important social

values. Therefore, evidence of how informal financing is used potentially contributes fresh insights and new perspective to this literature.

3.4 Summary statistics of financing sources

In table 3, we describe the percentage of each financing component, with panel A for each individual form, and panel B, groupings. In panel C, we present the correlations among these sources and their correlations with firm growth.

As panel A shows, while the "other" category ranks first, the second largest source is bank loans, which is 21% for working capital and 27% for new investment and most of them coming from local banks. The retained earning is the third largest source covering 16% for working capital and 13% for new investments. The equity financing comes next, with the majority coming from selling shares to other legal identities around 7%, funds raised from employees through equity are also significant covering more than 3% of the working capital and new investment, while the public issuance of equity only counts for about 1% of the funding. The distribution pattern paint a clear picture that the most important and largest components of the financial system in China – State owned banks and public equity market – contribute little to financing private firms.

Panel B shows that disclosed informal financing contributes about 8%-10% to total financing for firms' working capital as well as new investments. The majority, 6.7%~7.9% is in the constructive category and about 1.8% is in the underground financing.

Finally, panel C shows that firms' sales growth is positively associated with the usage of constructive informal financing in both new investment and in working capital. Bank financing and underground informal financing, however, have negative or very minimal correlations with

firms' sales growth. The usages of constructive informal financing in new investment and in working capital are highly correlated.

[Insert table 3 about here]

4. Empirical Analysis

4.1 Choice of informal financing

In table 4, we run logit regressions to explore the determinants of informal financing choices. The dependent variable is a dummy variable, which equals one if a particular type of informal financing is used for a particular operation purpose, otherwise 0. For example, the variable Dummy (constructive informal financing in new investment) equals one if the surveyed firm uses constructive informal financing in funding its new investment, otherwise zero. As such, there are four regressions respectively for four dependent variables in total: two financing sources by two operation functions. The explanatory variables include firm size, age, leverage, profitability, ownership structure, product market competitiveness, and industry fixed effect. We also control for the development of regional banking industry measured by the percentage of firms in the city that access bank loans.

As table 4 shows, the likelihood of using constructive informal financing is negatively associated with firm size, with marginal effects of -2.5% and -2.7% for working capital and new investment respectively. Both effects are significant at the 1% level. The likelihood of using constructive informal financing is also lower in the SOEs and old firms. In particular, SOEs are 10.5% and 7.4% less likely to use constructive informal financing to fund working capital and new investment, respectively. Both effects are significant at the 1% level. The likelihood of using underground financing is also negatively associated with firm size and state ownership but only significant in the working capital scenario. None of the economic factors except for the firm

age can explain the usage of underground financing. We also surprisingly find that the fraction of firms in the city accessing bank loans predicts the firm's usage of constructive financing in working capital with a marginal effect about 37.2%.

Our findings on the determinants of informal financing choices are consistent with Chinese government policies, our field observations, and evidence in existing literature that government biases resource allocation towards the state sector and large firms, leaving private firms and small firms largely constrained in obtaining financing. The positive and significant relation between the prevalence of access to bank loans and the usage of constructive informal financing suggests that bank loans and informal financing, though naturally substitutes for each other, may actually have a complementary relation in terms of their development and availability. We will explore this issue further in section 4.4 below.

[Insert table 4 about here]

4.2 Informal financing and firm growth

Endogeneity is always a concern in examining the finance-and-growth relationship. On one hand, firms with access to finance can grab investment opportunities and grow; on the other hand, firms that grow will have easy access to finance. Leading or lagging variables is one way to shed light on the causality question. The best leading-lagging relation offered by this survey data is to use financing in year t-1 to t to explain the sales change at the end of year t over the end of year t-1[6], which should be conservatively interpreted as a contemporary association. We therefore use two additional methods to address this endogeneity problem: the Heckman (1979) selection model and the propensity score matching method.

[6] This is exactly what ADM (2010) does in arguing that financing leads to growth.

The Heckman Model

In the 1st stage of the Heckman approach, we predict the usage of a particular financing source for either working capital or investment purpose based on the choice models in table 4. The only difference here is that we define Dummy (constructive informal financing) to equal one if the firm uses this source for either purpose. The same is true for underground financing. As the survey however does not inform whether collateral is used in accessing informal financing, we therefore use the fraction of firms accessing bank loans and the ownership of the firms as the instrument for informal financing. In the 2nd stage of the Heckman approach, we regress the firm growth over the year on financing choice at the beginning of the year. The control variables include firm characteristics, industry competition, other financing, and Heckman's lambda etc.

Table 5 presents results from the Heckman approach. The first two columns present the 1st and 2nd stage for constructing informal financing and the last two columns for underground financing. As table 5 shows, constructive informal financing is consistently and positively associated with firm growth both as the choice variable and as the control variable. The magnitude is around 8% and significant at the 5% level. Underground financing, however, is negative but insignificantly associated with firm growth. We conduct sensitivity tests by varying the specification of size using either continuous log(assets) or quintiles of asset size in the regressions and find that the above results are robust to the specification of control variables.

[Insert table 5 about here]

Propensity Score Matching Method

In the propensity score matching approach, we match firms based on the likelihood that each particular financing is used for each particular purpose. That is Dummy (constructive informal financing for new investment) equals one if the firm uses constructive informal financing to

finance new investment, otherwise zero. In the 1st stage, we predict the likelihood of each firm using a particular type of financing for a particular purpose as in the analysis for table 4. We then construct one matched sample for each type of financing. The treatment samples are firms that used the particular source for the particular function. The controlling samples are drawn from firms that do not use that particular source for that particular function. For each treatment firm, the controlling firm is chosen by matching (the same or the closest with less than 2% deviation) the corresponding type of likelihood. In the 2nd stage, we regress the firms' sales growth on the actual usage of financing sources for the particular purpose in each matched sample.

We report the results from the propensity score matching method in table 6 for usage of informal financing in new investment. When the treatment sample and control sample is correctly matched, the distribution of firm characteristics should be random across the treatment and control samples. Consistent with this prediction, panel A of table 6 shows that there is no significant difference in firm characteristics and financing likelihood that the matching is based on between the treatment sample and the controlling sample. The only difference is the actual usage of financing and the dependent variable that is to be explained.

Panel B presents the regression results within the matched samples. For each matched sample, we run two regressions that vary in firm size measurement one with log(assets) and the other size quintiles. Consistent with results in table 5 where the Heckman approach is used, constructive informal financing, in propensity matching method, is also consistently and positively associated with firm growth with the magnitude being around 17% and significant at the 5% level. Underground financing has no significant relation with the firm growth.

[Insert table 6 about here]

Findings from Heckman model and propensity score matching method are both consistent with the prediction from the mechanism-based approach: informal financing that uses business or social advantages to overcome information asymmetry and facilitate monitoring and renegotiation are effective financial intermediary channels, hence bring in positive economic performance. Although the empirical findings here shows no significant relation between underground financing and firm growth, we cannot exclude the possibility that underground financing may have a destructive effect on firm growth. This is because our empirical measurement of underground financing based on this survey data has to include some of the unidentifiable constructive sources that are banned by the central bank for other regulatory purposes.

4.3 Family values, financing cost, and project risk

Our constructive informal financing include both the family borrowing in which family relationship plays a key information role and trade credit in which business relationship plays a key role. It is worth differentiating them to shed light on the risk and costs relevant to informal financing in today's China. As Lee and Person (2012) argue, family borrowing, in addition to the information technology involves altruism which makes the financing cost likely cheaper than trade credit. On the other hand, social collateral values more than the economics stakes involved in the projects, therefore pushes entrepreneurs to use it as the last resort in order to reduce the risk imposed on altruist relatives. In summary, this theory implies that trade credits are more costly than family borrowing, while the latter is matched with less risky projects than the former.

We therefore analyze interpersonal borrowing and trade credit's relation with firm growth by coding them separately and for working capital and new investment respectively. The results are reported in table 7. We find that interpersonal borrowing from family and relatives are

associated with around 12% of sales growth, and the relation is significant at the 5% level. Trade credit however is not significantly associated with firm growth.

This finding, from Lee and Person's (2012) perspective, suggests that there are many low risk and profitable projects in China, but access to financing at a reasonable cost is the largest hurdle to achieve growth. As financing through the formal sector is costly, trade credits channeled through formal sources (Cull, Xu, and Zhou 2009) are likely to be very costly too. We analyze access to trade credit and find that large firms and firms with bank loan access are more likely to have access to trade credit (untabulated). This empirical evidence explains why trade credit cannot play an effective substitution role in China. As a result, family lending becomes an important factor for China's economic growth.

[Insert table 7 about here]

4.4. Substitutes or complements: bank financing and informal financing

As family transfers play an important role in supporting firm growth, economic improvement by households reinforces the advancement of the corporate sector. Therefore, our earlier findings that informal financing are more prevalent in regions where banks grant more credit to firms is quite intuitive. That is formal and informal financing are complementary to each other in terms of their development. In this subsection, we further analyze their relation in terms of their role in supporting firm growth.

We regress firm growth on the usage of constructive informal financing, the % of firms in the region that access bank loans, their interactive and other control variables. As table 8 shows, regional development in bank financing is positively and significantly associated with firm growth. The coefficient is large ranging between 36% and 50%, and always significant at the 5% level. Usage of constructive informal financing is also positively associated with firm growth

with a coefficient of 8% ~12% on average. The coefficients on their interactions, however, are negative and in one of the specifications, significant.

These findings in table 8 deliver three strong messages. First, the development of the banking industry is highly associated with firm growth. Second, constructive informal financing is also important for firm growth. Finally, constructive informal financing plays a slightly diminishing role where the banking industry is more developed. Together with the early finding that constructive informal financing is more prevalent in cities where more firms access bank loans, we can see that informal financing can effectively support economic growth when bank credits supply lags behind economic demand. Its development, however, largely depends on banking development and hence on the economic advance of householders. Therefore formal and informal financing are both substitutes and complements.

[Insert table 8 about here]

5. Is China an outlier?

As the World Bank Enterprise Surveys covers registered businesses across countries with similar survey questions, we are able to conduct the same empirical examination in other countries. We do not expect the results found in China to be robust in all other countries, because institutional background, social structure, and family interactions vary across countries and they play the key role in forming informal financing mechanisms. An important question is whether China is an outlier and if so to what extent China is it an outlier. Therefore, we examine informal financing in another 12 emerging countries covered by the survey. These 12 countries are either among the top 10 largest emerging economies or the top 10 fastest growing emerging economies in the world.

5.1 Informal financing across countries

In table 9, we present, for these 12 countries together with China, the year when the surveys are conducted, the sample size, and the composition of financing for each country. In panel A, we present the percentage of each financing source for working capital and in panel B, new investment. In panel C, we present the descriptive statistics for the control variables.

Consistent with Beck, Demirguc-Kunt, and Maskmovic (1998)'s description of financing patterns around the world, panel A shows that for most countries the largest financing component is "retained earnings", followed by "bank financing". The percentage of informal financing, based on our categorization of constructive financing (trade credit + personal lending) and underground financing (other informal) on average accounts for 13.02% (median) or 13.16% (mean) of total financing of working capital. It is the lowest at 4.25% in Egypt and the highest at 20.42% in Brazil. China at 9.87% actually locates in the lower middle part of the range. Panel B shows a similar pattern in the financing for new investments. In particular, the % of informal financing in China is 8.75%, which is comparable to the mean across countries of 7.50%. Therefore, China is not an outlier in using informal financing. In fact, it is quite an "average" country compared to other large or fast developing economies.

[Insert table 9 about here]

The reason that informal financing in China appears to be much higher than in other countries according to AQQ (2005) and Allen, Carletti, Qian, and Valenzuela (2013), is that they group the "other" item (38.57%) into informal financing. There is an issue whether "other" is really informal financing, because the survey questionnaires have listed various sources of "informal" as well as a choice of "other informal". Possibly due to variation of certain financing items' definitions across countries, some formal/informal financing items are recorded in the

"other" item. One rationale that ADM (2010) treat them as retained earnings is that these countries' retained earnings appear to be lower than others. Indonesia (19.47% in other) and Sri Lanka (15.81% in other) may have this similar problem as China. In this paper we have chosen to be conservative and only include what is definitely informal financing.

We present the firm and industry characteristics in Panel C. Firm size, measured by total assets, varies across countries. Sample firms in Chile and Pakistan are particularly large with average total assets of $3,373 million and $1,454 million, respectively. China's sample average of firm size and age are close to the median across countries averages. Using the same criteria as for Chinese firms, *Dummy SOE* in the international sample equals one if the government holds more than a 50% stake in the firm, otherwise zero. *Bank Loan Dummy* equals one if a firm has an overdraft facility or line of credit, otherwise zero.

The survey asks firms to rank the degree to which access to Finance becomes a major constraint for business development. The rank ranges from 0 to 4, with 4 indicating the most severe constraint and 0, the least. The constraint in access to finance is most severe in Brazil (2.59) and least severe in South Africa (0.79). This question, however, is not available for the Chinese sample. Hence we are unable to infer whether China is an "average" country in terms of the severity of access to finance impeding their development. Another shortcoming of the international survey sample is that information on competitors is missing for some countries: Chile, China, Egypt, Turkey, and Vietnam. Therefore, we construct a dummy variable to indicate whether competition information is missing for a firm. The mean of this dummy is 58% for the international sample.

5.2 Informal financing and firm growth across countries

In analyzing the relation between informal financing and firm growth, we use the Heckman approach to control for endogeneity. In the first stage, we analyze the determinants of constructive informal financing and underground financing respectively. The dependent variable *Dummy(constructive informal financing*) equals one if constructive informal financing is used in either working capital or new investment. The same is done for underground financing. As we don't have the city level information on financial development for other countries as we do for China, we use the rank of how severe access to finance imposes constraints on firm business as the instrumental variable. Other explanatory variables include firm size, age, state ownership, industry competition, bank financing, other financing, and industry fixed effect. In the second stage, we regress firms' log(sales growth) on constructive informal financing and underground financing respectively. The control variables include all the above and Heckman's lambda from the first stage.

We present the results in table 10, with panel A for constructive informal financing and panel B for underground financing. As the table shows, with occasional exceptions, firms' usage of informal financing, both for constructive informal ones and underground ones, are significantly and positively associated with firms' rank of severity that access to finance becomes their development constraint. In Chile, the Philippines, and Sri Lanka, the usage of constructive informal financing are also significantly and positively associated with firms' access to bank loans just as in China. These relations, however, are obfuscated when it comes to underground financing.

For the role of supporting firm growth, we find that, in the Turkish sample, usage of constructive informal financing is positively and significantly associated with log(sales) growth

(coefficient 0.098 and t stats 2.06). This relation however does not show up in other countries, and even goes the opposite way for Thailand. The results on Thailand are overall quite puzzling, because even bank loan access in that country is negative and significantly associated with firm growth.

For the analysis of underground financing, Egypt and South Africa drop out of the sample because of perfect prediction in the 1st stage. In the remaining 10 countries, 7 of them display a negative relation between underground financing and firm growth. This negative relation is significant in Bangladesh, Brazil and Sri Lanka.

In sum, the Heckman analyses deliver the following results. First, the constraint on access to finance encourages the usage of informal financing as substitutes. Second, access to constructive informal financing is complimentary to access to bank loans, because they are positively associated with each other. Third, constructive informal financing (underground financing) is positively (negatively) associated with firm growth in some other countries just as in China. Overall, these results suggest that China is not the only country that benefits from informal financing and that our approach of categorizing informal financing is applicable to other countries to certain extent.

[Insert table 10 about here]

As the "other" item represents an important component of financing and we are not very sure what it includes, we want to examine whether this item has driven the discrepancy in the literature regarding the role of informal financing. We apply the same Heckman approach to this item as to the informal financing. We find that the severity of access to finance as a business constraint does not explain the "other" financing. Furthermore, "other" is associated with firm growth neither in the Chinese sample nor in the majority of other countries. As such, the opaque

"other" drives neither our results in this paper nor the discrepancy in the literature regarding the role of informal financing. Nevertheless, this category calls for more attention and probable comparative approach to understand the informal financing across countries.

6. Conclusion

We propose an approach to differentiate informal financing by whether the providers have effective information technology to overcome moral hazard and adverse selection problems that impede formal financing for SMEs. We find that constructive informal financing that has an information advantage and monitoring mechanisms through social or business networks can fix the gap between bank and small firms, and hence support firm growth. Underground financing, on the other hand, without such mechanisms cannot achieve the effect. We also find that the development of the banking industry complements the development of constructive informal financing. While they both play important roles in supporting economic growth, the marginal effect of constructive informal financing, however, declines when bank credits become prevalent.

Our approach advocates an understanding of informal financing in terms of its information mechanism. The empirical evidence based on this approach reconciles the differences in the existing literature in terms of the role of informal financing. Furthermore, although some studies argue that the Chinese government's ban on informal financing are largely politically driven, our findings suggest that it is partially economic-justifiable, because it also attempts to eliminate some informal sources that involve violence, potentially social-destructive, and fail to bring constructive values to firms and the overall economy.

Finally, the international evidence suggests that China is quite an "average" in terms of using informal financing. Access to formal finance is a severe business constraint on small

private firms in most large and fast growing economics, so informal financing becomes more developed. Constructive informal financing is associated with positive firm growth in some countries and underground financing is associated with negative growth in most countries. As such, our information-mechanism-based understanding of informal financing is applicable to other countries.

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Table 1: Classification of informal financing

Criterion	Constructive informal financing	Underground financing
Information technology	Personal relationship, social relationship, or business relationship	No relationship or indirect network
Monitoring and risk assessment	Social collateral Economic collateral	None
Pricing	Linked to risk and collateral	Fixed predatory rate or fees
Recourse/renegotiation in case of delinquency	restructuring arrangement	Violence
Lending targets	Entrepreneurship, business operation, production	speculation, consumption, or gambling
Examples	Trade credit, small loan company, banks' credit extension arms, registered pawnshops or financing companies, interpersonal lending between family and relatives	Loan sharks, unregistered pawnshop, self-claimed lending agency or loan brokers
Legal status	Legal or socially acknowledged	Illegal or socially impermissible

Table 2: Descriptions of sample firms in the survey

We describe the surveyed sample firms in this table. For the 2,400 Chinese firms covered in the survey, we summarize their size (total assets), leverage (debt/equity), fixed assets, sales, age, and their ownership structure in year 2002. The amount of total asset, fixed asset and sales are converted from RMB to USD dollar based on the exchange rate in 2002: USD/CNY=8.28.

We also describe their sales growth and productivity growth from year 2001 to 2002, reinvestment rate, interest burden, profit margin, etc. in year 2002. Sales growth = ln(sale in 2002/sales in 2001); Labor productivity =(Sales-total materials cost)/total number of workers; Labor productivity growth =ln(productivity in 2002/productivity in 2001). Interest burden=interest payment/revenue; Margin=profit/revenue.

Finally, we describe their bank loan access: the percentage firms with bank loan access, approval time (Long Term Loan) and approval time (Short Term Loan) are the days it takes from filing loan application to drawing funding. The loan interest rate is the actual interest rate in the loan contract.

Variable	N	Mean	Median	Std	Min	Max
Total Asset (USD million)	2,130	24.49	1.94	122.04	-78.65	2,187.04
Fixed Asset (USD million)	2,105	14.73	0.73	95.72	0.00	2,007.21
Leverage (Debt/Equity)	2,090	5.24	1.11	100.27	-259.33	4,475.94
Age (year)	2,155	16.29	10.00	14.45	3.00	53.00
Sales (USD million)	2,155	15.26	1.12	84.92	0.00	2,632.09
# of employees	2,155	537.73	121	2560.14	16.00	70169.00
Dummy (SOE)	2,155	0.22	0.00	0.41	0.00	1.00
Dummy (Corporate)	2,155	0.40	0.00	0.49	0.00	1.00
Dummy (Cooperative/Collectives)	2,155	0.16	0.00	0.37	0.00	1.00
Sale Growth (%)	2,142	34.28	7.13	345.33	-99.00	5,851.99
Labor Productivity Factor Growth (%)	1,463	0.47	3.99	8.15	-667.96	801.89
Re-investment Rate (%)	1,911	18.51	0.00	32.91	0.00	100.00
Margin (Profit/Revenue %)	2,145	-23.46	0.65	253.27	-6489.68	1865.14
Interest Burden (%)	2,146	6.14	0.00	109.10	-17.77	4904.46
Dummy (Bank loan access)	2,142	0.24	0.00	0.43	0.00	1.00
Approval time (Days, Long Term Loan)	888	42.73	30.00	57.59	1.00	547.00
Approval time (Days, Short Term Loan)	1,142	23.26	15.00	28.52	1.00	300.00
Bank loan interest rate (%)	1,100	5.37	5.45	4.90	0.01	100.00

Table 3: Financing components of surveyed firms.

We describe the percentage of each financing components contributed to firms working capital and new investment. In panel A, we present the percentage of each detailed components. In panel B, we present the percentage of each group. The six groups are: (1). Bank Financing, which includes local commercial banks and foreign commercial banks; (2). Equity Financing, which includes the private issuance of equity to both management, employee, other agents and public issuance of equity of outside investors; (3). Government support which include investment funds or special development financing or other state services; (4).Internal funding which includes retained earnings and others; (5) Constructive informal financing which includes Trade credit and loans from family and friends; (6). Underground financing takes "other informal" item, presumably include money lender, pawnshops, loan sharks and informal banks, etc.

Panel A: Percentage of each financing components

	No. of obs.	Local Banks	Foreign Banks	Equity Fin. (employees)	Equity Fin. (legal person)	Equity Fin. (public issue)	Retained Earnings	Trade Credit	Inter-personal loan	Govt. Fund	Others
New investment	2,155	20.96	0.13	3.09	7.74	1.19	15.94	1.11	5.61	0.59	41.74
Working capital	2,155	27.54	0.18	3.23	7.28	0.71	13.33	2.39	5.52	0.42	37.60

Panel B: Percentage of each financing source groups

	No. of obs.	Bank Financing	Equity Financing	Government Fund	Retained earnings,	others	Constructive informal Financing	Underground Financing
New investment	2,155	21.09	12.02	0.59	15.94	41.74	6.72	1.89
Working capital	2,155	27.72	11.22	0.42	13.33	37.60	7.91	1.80

Panel C: Correlation among financing sources and firm growth

	Log (Sale growth)	Bank loan Dummy	Constr. informal financing	--New Investment	--Working Capital	Under. financing
Log (Sale growth)	1					
Bank loan Dummy	0.032	1				
Constructive informal Financing	**0.06****	0.03	1			
-- New Investment	**0.07****	-0.05*	**0.79*****	1		
-- Working Capital	**0.05****	0.03	**0.98*****	**0.76*****	1	
Underground financing	-0.01	-0.05	**0.09*****	**0.08*****	**0.1*****	1

Table 4: Determinants of informal financing sources

We explain the usage of informal financing with firm characteristics, profitability, ownership structure, and product market competitiveness. The dependent variable equals 1 if the corresponding type of informal financing is used for the corresponding operation purpose, otherwise 0. The explanatory variables are ln(assets), ln(age), Past year sales growth, profit margin. Dummy (Collateral) equals 1 if the firm was able to provide collateral for its existing bank loans, otherwise zero. Dummy (Negative equity) equals 1 if the firm's equity value is negative, otherwise zero. To control for the bank financing environment, we compute the % of firms in the city (in the survey sample) that have access to bank loans. For the ownership, dummy (Corporate) takes the value of 1 if the firm is organized as a corporation (public or private) and 0 otherwise. Cooperatives/Collectives Dummy takes the value of 1 if the firm is organized as a Cooperative or a Collective. State Ownership Dummy takes the value of 1 if the state owns more than 50% of the company. We report the marginal effect, and the t-statistics are in parentheses below the coefficients. ***, **, and * represents significance at the 1%, 5%, and 10% respectively.

Dependent =	Constructive informal financing		Underground financing	
Usage of informal finance	Working capital	New investment	Working capital	New investment
	(1)	(2)	(3)	(4)
Ln(Asset)	-0.025***	-0.027***	-0.006*	-0.003
	(-4.74)	(-6.03)	(-1.95)	(-1.36)
Ln(age)	-0.041***	-0.018	0.005	0.013*
	(-2.60)	(-1.33)	-0.64	(1.83)
Sales growth (1999 to 2001)	-0.027	-0.084	-0.134	-0.043
	(-0.22)	(-0.55)	(-0.32)	(-0.22)
Profit Margin	0.019	0.008	-0.001	-0.002
	(1.53)	(1.03)	(-0.65)	(-1.57)
Dummy (Collateral)	0.026	0.010	0.012	-0.003
	(1.26)	(0.63)	-1.04	(-0.33)
Dummy (Neg Equity)	0.027	0.049	0.001	-0.008
	(0.64)	(1.18)	-0.04	(-0.37)
Fraction of firms in the city	0.372***	0.083	-0.018	-0.075
accessing bank loans	(3.22)	(0.85)	(-0.25)	(-1.18)
Dummy (SOE)	-0.105***	-0.074***	0.016	-0.008
	(-3.58)	(-2.73)	-0.92	(-0.62)
Dummy (Corporate)	0.019	0.033*	0.029**	0.015
	(0.87)	(1.79)	-2.1	(1.27)
Dummy (Coop./Coll.)	-0.028	-0.012	0.001	-0.017
	(-0.91)	(-0.48)	-0.04	(-1.15)
Dummy (16~100 Competitors)	-0.040	-0.047**	-0.018	-0.016
	(-1.55)	(-2.36)	(-1.33)	(-1.38)
Dummy(>100 Competitors)	0.038	0.015	-0.005	-0.008
	(1.62)	(0.78)	(-0.40)	(-0.79)
Observations	1,216	872	1,216	872
Pseudo R-squared	0.11	0.19	0.03	0.06

Table 5: Informal financing and firm growth – Heckman's approach

In the 1st step, we explain the determinants of usage of constructive informal financing. In the second stage, we examine the financing and growth nexus with controlling for the predicted likelihood of the constructive informal financing with Heckman's lamda. The instruments in the 1st stage are the percentage of firms in the city having bank loan access and firm ownership. In the parenthesis below the coefficients are t-statistics. ***, **, and * represents significance at the 1*, 5%, and 10% level respectively.

Dependent =	Dummy (Const. Combined.)	Log (Sales growth)	Dummy (Underground Comb.)	Log (Sales growth)
	(3)	(4)	(3)	(4)
Bank loan dummy		0.055*		0.058*
		(1.66)		(1.74)
Constructive informal financing		0.079**		0.082**
		(2.01)		(2.09)
Underground financing		-0.052		-0.050
		(-0.81)		(-0.78)
Fraction of firms in the city	0.329***		0.007	
accessing bank loans	(3.30)		(0.11)	
Dummy (SOE)	-0.115***		0.005	
	(-4.68)		(0.31)	
Dummy (Corporate)	0.041**		0.026**	
	(2.13)		(2.10)	
Dummy (Coop./Coll.)	-0.024		0.004	
	(-0.94)		(0.25)	
Log(Asset)	-0.015***	-0.010	-0.005*	-0.014
	(-3.60)	(-1.30)	(-1.83)	(-1.48)
Log (Age)	-0.026**	-0.038*	0.003	-0.039**
	(-1.97)	(-1.70)	(0.41)	(-2.12)
Sales growth (99 to 01)	-0.014	-0.021	-0.289	-0.255
	(-0.12)	(-0.11)	(-0.48)	(-0.59)
Profit Margin	0.012	-0.031***	-0.002	-0.032***
	(1.41)	(-4.01)	(-0.75)	(-4.34)
Dummy (Negative Equity)	0.053	-0.181***	0.001	-0.182***
	(1.48)	(-3.37)	(0.07)	(-3.40)
Lambda		-0.002		0.080
		(-0.04)		(0.60)
Constant		0.315***		0.189
		(3.80)		(0.84)
Market competition are controlled for in using Dummy(16~100 competitors) and Dummy(>100 competitors)				
Observations	1,664	1,664	1,664	1,664
R-squared		0.03		0.03

Table 6: Informal financing and firm growth – propensity score matching method.

In the 1st step, we analyze the determinants of financing. For each of the treatment firm that does use the specific financing source for the specific function purpose, we find a matching controlling firm for it. The controlling firm meets two requirements: first it is a firm that does not use that specific financings sources for nay function, and second it has the same likelihood (if not the same, the closest with less than 2% deviation) based on the 1st stage model's prediction of the informal financing source usage. In the 2nd stage, we regress the firm growth on dummy(using specific financing sources for specific function) within the matched sample and with other financing sources and firm characteristics controlled for.

In panel A, we compare the firm characteristics of the treatment sample and controlling sample. In panel B, we report the regression results from the matched sample. T-statistics are in the parentheses. *,**, and *** represent the significance at the 10%, 5%, and 1% level respectively.

Panel A: Comparison of firm characteristic in the matched samples

Matched sample by the likelihood of access to:	Constructive informal financing in new investment		Underground financing in new investment	
	Treatment sample mean – controlling sample mean	t-stat of the difference in mean	Treatment sample mean – controlling sample mean	t-stat of the difference in mean
Log Sales Growth (%)	0.151*	(1.85)	0.030	(0.18)
Dummy (Bank loan)	-0.043	(-0.66)	-0.208	(-1.64)
% of firms in the city using constr. inf. fin.	0.002	(0.16)	0.003	(0.18)
Dummy (Collateral)	-0.011	(-0.15)	0.083	(0.57)
Sales growth (99~01)	0.002	(1.30)	0.002	(0.88)
Margin (Profit/Sales, %)	0.121	(0.57)	-0.765	(-1.04)
Dummy (Negative Equity)	0.000	0.00	0.000	0.00
Log Asset	0.007	(0.03)	-0.294	(-0.43)
Dummy (State)	-0.011	(-0.45)	0.000	0.00
Dummy (Corp)	0.021	(0.30)	0.000	0.00
Dummy (Coop/Col)	0.043	(1.04)	0.042	(1.00)
Dummy (16~100 Competitors)	0.000	0.00	0.000	0.00
Dummy(>100 Competitors)	-0.021	(-0.29)	-0.125	(-0.86)
Log(Age)	0.062	(0.72)	-0.108	(-0.45)

Panel B OLS results within the matched sample: Dependent = Log(sale growth 2001 ~ 2002)

	Constructive informal financing		Underground financing	
	(1)	(2)	(1)	(2)
Dummy (Bank loan)	0.189**	0.188**	0.122	0.068
	(2.00)	(2.01)	(0.54)	(0.31)
Dummy (Const. informal fin.in new investment)	0.167**	0.172**		
	(2.08)	(2.13)		
Dummy (Underground fin. in new investment)			-0.049	0.033
			(-0.24)	(0.18)
Log (Asset)		-0.012		-0.033
		(-0.51)		(-0.63)
Very large	-0.268*		-0.177	
	(-1.71)		(-0.52)	
Large	-0.159		0.418	
	(-1.25)		(1.26)	
Medium	-0.178		0.292	
	(-1.38)		(0.80)	
Small	-0.275**		0.139	
	(-2.35)		(0.42)	
Dummy (Negative Equity)	-0.263	-0.28	-0.537	-0.447
	(-1.53)	(-1.60)	(-1.04)	(-0.88)
Dummy (SOE)	0.102	0.122	-0.059	-0.095
	(0.4)	(0.47)	(-0.19)	(-0.31)
Dummy (Corporate)	-0.044	-0.046	0.406*	0.209
	(-0.45)	(-0.48)	(1.75)	(0.95)
Dummy (Coop./Coll.)	-0.208	-0.12	-0.152	-0.29
	(-1.24)	(-0.73)	(-0.19)	(-0.41)
Dummy (16~100 Comp)	-0.113	-0.073	-0.185	0.012
	(-0.85)	(-0.54)	(-0.56)	(0.04)
Dummy(>100 Comp)	-0.135	-0.131	-0.235	-0.22
	(-1.43)	(-1.38)	(-1.00)	(-0.87)
Log(Age)	-0.128*	-0.133*	0.134	0.127
	(-1.73)	(-1.77)	(1.06)	(1.03)
Constant	0.577***	0.508*	-0.462	0.082
	(2.84)	(1.83)	(-0.89)	(0.11)
Observations	188	188	48	48
R-squared	0.13	0.1	0.25	0.15

Table 7: Within constructive informal financing: trade credit and personal borrowing from family and relatives

In this table, we explain firm growth with financing sources, firm characteristics, and product market competitiveness. We separate constructive informal financing into trade credit and interpersonal (family) borrowing. The numbers in parentheses are *t*-statistics. ***, **, and * represents significance at the 1%, 5%, and 10% respectively.

Dependent =	Ln(sale growth 2001 ~ 2002)			
Usage of informal finance	Working capital		New investment	
	(1)	(2)	(3)	(4)
Interpersonal Borrowing	0.114**		0.126**	
	(2.46)		(2.17)	
Trade Credit		0.005		0.099
		(0.08)		(0.94)
Dummy(bank loans)	0.053	0.055*	0.058	0.059
	(1.60)	(1.68)	(1.57)	(1.59)
Dummy (Neg Equity)	-0.135**	-0.133**	-0.145**	-0.142**
	(-2.53)	(-2.49)	(-2.20)	(-2.14)
Ln(Asset)	-0.008	-0.012	-0.007	-0.011
	(-1.15)	(-1.62)	(-0.82)	(-1.31)
Dummy (SOE)	0.024	0.021	0.003	0.001
	(0.63)	(0.54)	(0.06)	(0.02)
Dummy (Corporate)	-0.033	-0.022	-0.032	-0.022
	(-1.02)	(-0.68)	(-0.88)	(-0.61)
Dummy (Coop./Coll.)	-0.049	-0.050	-0.020	-0.021
	(-1.13)	(-1.16)	(-0.38)	(-0.41)
Dummy (16~100 Competitors)	-0.047	-0.048	-0.075*	-0.074*
	(-1.31)	(-1.32)	(-1.80)	(-1.76)
Dummy(>100 Competitors)	-0.119***	-0.116***	-0.140***	-0.134***
	(-3.66)	(-3.58)	(-3.69)	(-3.52)
Ln(age)	-0.046**	-0.045**	-0.046**	-0.046**
	(-2.29)	(-2.26)	(-1.99)	(-2.00)
Constant	0.325***	0.363***	0.334***	0.374***
	(3.74)	(4.23)	(3.36)	(3.84)
Observations	1,721	1,721	1,214	1,214
R-squared	0.02	0.02	0.03	0.03

Table 8: Complementary role of bank financing and constructive informal financing
In this table, we explain firm growth with financing sources, firm characteristics, ownership, and the competiveness on the product market. We include a new variable, % of firms in the city using constructive informal financing, and its interaction with bank loan access. The numbers in parentheses are *t*-statistics. ***, **, and * represents significance at the 1%, 5%, and 10% respectively.

Dependent =	Ln(sale growth 2001 ~ 2002)			
Usage of informal finance	Working capital		New investment	
	(1)	(2)	(3)	(4)
Dummy (Constructive Informal financing)	0.233*	0.079**	0.400**	0.127**
	(1.88)	(2.02)	(2.45)	(2.40)
% of firms in the city using bank loan	0.452**	0.362**	0.501**	0.390**
	(2.46)	(2.12)	(2.43)	(1.98)
% of firms in the city using bank loan	-0.598		-1.109*	
* Dummy (Constructive inf. fin.)	(-1.31)		(-1.77)	
Ln(Asset)	-0.009	-0.009	-0.006	-0.006
	(-1.28)	(-1.35)	(-0.75)	(-0.76)
Log(Age)	-0.045**	-0.045**	-0.046**	-0.047**
	(-2.24)	(-2.23)	(-1.99)	(-2.04)
Dummy (Negative Equity)	-0.138***	-0.138***	-0.151**	-0.149**
	(-2.60)	(-2.60)	(-2.29)	(-2.26)
Dummy (SOE)	0.029	0.030	0.009	0.010
	(0.75)	(0.77)	(0.22)	(0.22)
Dummy (Corporate)	-0.029	-0.029	-0.029	-0.031
	(-0.91)	(-0.91)	(-0.81)	(-0.85)
Dummy (Coop./Coll.)	-0.041	-0.042	-0.012	-0.013
	(-0.94)	(-0.97)	(-0.22)	(-0.26)
Dummy (16~100 Competitors)	-0.048	-0.047	-0.079*	-0.075*
	(-1.31)	(-1.31)	(-1.90)	(-1.80)
Dummy(>100 Competitors)	-0.117***	-0.117***	-0.141***	-0.138***
	(-3.61)	(-3.61)	(-3.72)	(-3.65)
Constant	0.227**	0.253***	0.213**	0.244**
	(2.50)	(2.85)	(2.06)	(2.39)
Observations	1,721	1,721	1,214	1,214
R-squared	0.03	0.02	0.03	0.03

Table 9: Financing sources by country

This table presents the financing composition (% of the total financing) for each country. *Bank Financing* includes financing from domestic and foreign banks; *Operation Financing* includes Credit Card and Leasing arrangement. *Constructive informal financing* include *trade credit* and *Interpersonal loans. Underground financing is measured with other informal financing. Access to Financing as Business Constraint* ranges from 0 to 4 indicating how severe the access to financing imposes constrains on the firms' business development (4 indicates most severe, 0 indicates least severe).

Panel A: Financing in working capital (%)

Country	Year of Survey	# of firms	Bank Financing	Equity Financing	Government Fund	Retained earnings	Operation Financing	Trade Credit	Inter-personal loan	Other Informal	Other	Constructive +Undergrou nd (TC, IPL, OI)
Bangladesh	2002	974	33.21	0.51	0.48	55.82	0.51	4.17	4.26	0.46	0.58	8.90
Brazil	2003	1,505	26.95	3.03	2.26	43.99	1.50	15.37	2.52	2.53	1.84	20.42
Chile	2004	922	27.35	0.48	1.76	52.16	1.82	6.80	0.97	0.36	8.31	8.13
China	2003	1,902	26.51	11.54	0.38	13.13	NA	2.29	5.76	1.82	38.57	9.87
Egypt	2004	704	6.05	2.66	0.20	85.62	0.28	1.67	2.49	0.09	0.94	4.25
Indonesia	2003	482	17.74	1.61	0.94	39.93	1.18	3.63	8.89	6.61	19.47	19.13
Pakistan	2002	936	4.92	12.87	1.28	65.27	1.43	4.70	6.99	1.29	1.26	12.98
Philippines	2003	650	8.48	5.99	0.29	61.87	0.62	11.54	8.25	1.09	1.87	20.89
South Africa	2003	505	15.64	0.65	0.15	66.94	1.03	11.68	1.14	0.21	2.57	13.02
Sri Lanka	2004	369	22.69	12.76	1.89	32.15	1.44	10.24	2.67	0.35	15.81	13.26
Thailand	2004	1,385	45.69	11.04	0.58	24.82	NA	13.61	1.48	1.11	1.38	16.19
Turkey	2005	599	19.65	10.23	6.40	49.25	3.72	6.57	3.56	0.16	0.46	10.29
Vietnam	2005	1,096	27.60	26.36	0.84	27.23	0.72	7.43	5.30	0.65	3.04	13.38
Total		12,029	24.36	8.43	1.21	42.72	1.26	7.75	4.10	1.31	9.10	13.16

Panel B: Financing in New investments (%)

Country	Year of Survey	# of firms	Bank Financing	Equity Financing	Government Fund	Retained earnings	Operation Financing	Trade Credit	Inter-personal loan	Other Informal	Others	Constructive +Underground (TC, IPL, OI)
Bangladesh	2002	884	29.60	0.38	0.26	60.04	1.77	2.64	4.31	0.35	0.65	7.30
Brazil	2003	1,248	14.24	4.27	8.61	56.26	3.52	8.69	1.12	1.05	2.25	10.85
Chile	2004	655	30.74	1.21	2.55	47.48	6.08	3.51	0.60	0.23	7.60	4.34
China	2003	1,331	20.53	12.35	0.48	15.29	NA	1.04	5.93	1.78	42.60	8.75
Egypt	2004	523	6.63	3.70	0.19	87.03	0.08	0.80	0.95	0.00	0.62	1.75
Indonesia	2003	203	19.61	1.72	2.35	39.53	3.43	2.44	10.78	7.76	12.37	20.99
Pakistan	2002	222	6.70	15.95	1.28	56.97	3.50	1.96	10.20	2.71	0.72	14.87
Philippines	2003	179	13.29	4.34	0.20	57.96	1.52	7.96	10.17	0.59	3.97	18.73
South Africa	2003	462	16.12	0.09	0.50	59.51	16.25	0.62	0.84	0.22	5.86	1.68
Sri Lanka	2004	252	15.16	2.66	2.17	50.84	4.54	2.13	1.58	0.28	20.63	3.99
Thailand	2004	1,382	58.33	13.45	0.35	19.33	NA	3.53	1.82	0.68	1.95	6.03
Turkey	2005	402	23.24	9.56	5.67	46.82	7.09	4.40	2.62	0.17	0.42	7.20
Vietnam	2005	930	28.04	26.97	3.23	30.41	0.55	1.01	4.64	0.54	3.82	6.19
Total		8,673	26.52	8.96	2.39	42.13	3.98	3.23	3.34	0.93	9.58	7.50

Panel C: Summary statistics of firm and industry characteristics

Country	Year of Survey	# of firms	Log (Asset in USD million)	Age	Dummy SOE	Dummy (16~100 Com)	Dummy (>100 Comp)	Dummy (Missing Com.)	Bank Loan Dummy	Access to financing as business constraint
Bangladesh	2002	976	2.66	13.25	0.00	0.36	0.33	0.06	0.66	2.06
Brazil	2003	1,508	6.80	19.72	0.00	0.02	0.01	0.71	0.75	2.59
Chile	2004	935	3373.46	26.24	0.01	0.00	0.00	1.00	0.84	1.12
China	2003	2,155	24.49	15.97	0.22	0.00	0.00	1.00	0.26	NA
Egypt	2004	702	3.21	20.62	0.02	0.00	0.00	1.00	0.12	1.51
Indonesia	2003	481	54.31	19.31	0.03	0.06	0.01	0.22	0.24	1.23
Pakistan	2002	132	1454.29	23.87	0.01	0.56	0.14	0.01	0.23	1.86
Philippines	2003	630	8.90	19.60	0.00	0.08	0.01	0.19	0.31	0.90
South Africa	2003	508	16.33	26.87	0.00	0.08	0.01	0.02	1.00	0.79
Sri Lanka	2004	383	2.20	31.40	0.11	0.03	0.01	0.54	0.61	0.84
Thailand	2004	1,385	10.54	15.45	0.00	0.42	0.10	0.00	0.85	0.87
Turkey	2005	641	7.69	19.86	0.01	0.00	0.00	1.00	0.54	2.31
Vietnam	2005	1,104	3.45	12.49	0.21	0.00	0.00	1.00	0.41	1.83
Total		11,752	371.09	18.54	0.07	0.13	0.05	0.58	0.51	1.61

Table 10: Informal financing and firm growth -- Heckman's test

In this table, we present the Heckman tests' results on the relation of informal financing usage and firm growth. In panel A, the analysis is on constructive financing and panel B, underground financing. In both panels, we report the key coefficients and standard errors for the regression for each country.

In the first stage, we analyse the determinants of using informal financing with probit model. If the interest is constructive informal financing, the dependent variable is Dummy (constructive informal) equal 1 if constructive informal is used in working capital or investment, otherwise zero. The similar is done for underground financing. The explanatory variables include firm size, age, state ownership, industry competition, and most important access to bank loans and a scale measure to measure the severity of *access to financing as business constrains*. Its value varies from 0 to 4. Industry fixed effect is also controlled for.

In the second stage, we regress the firms' sale growth on usage of informal financing and Heckman's lamda from the first stage. Other controlling variables include firm size, age, state ownership, industry fixed effect, and usage of other financing sources: bank loan, others.

Panel A: Constructive informal financing and firm growth

	Banglades h	Brazil	Chile	Egypt	Indonesia	Pakistan	Philippines	South Africa	Sri Lanka	Thailand	Turkey	Vietnam
Stage 1: the determinants of using constructive financing												
Financing Access	-0.022**	0.033***	0.048***	0.001	0.046***	0.052	0.058***	0.025	0.047**	0.026**	0.038***	0.047***
as constraint	(-2.02)	(3.51)	(5.36)	(0.13)	(2.95)	(1.58)	(3.54)	(1.09)	(2.10)	(2.36)	(2.64)	(4.47)
Bank Loan Dummy	-0.015	-0.000	0.087**	0.051	0.035	0.115	0.126***	NA	0.233***	0.036	0.033	-0.001
	(-0.47)	(-0.01)	(2.50)	(1.30)	(0.73)	(1.18)	(2.71)	NA	(3.89)	(0.84)	(0.79)	(-0.03)
Control variables are: Log(firm asset), log(age), Dummy(state ownership), Dummy(16~100 competitors), Dummy(>100 competitors), Dummy(missing Competitor inf), industry fixed effect												
Observations	941	1,484	918	510	468	118	616	341	368	1,280	576	1,053
Psuedo R-square	0.02	0.01	0.05	0.05	0.03	0.07	0.04	0.03	0.14	0.07	0.03	0.03
Stage 2: Constructive informal financing and firm growth												
Constructive Inform	-0.021	-0.027	0.013	-0.024	-0.003	-0.002	-0.004	-0.029	-0.036	-0.058**	0.098**	-0.030
	(-0.89)	(-1.55)	(0.34)	(-0.31)	(-0.07)	(-0.02)	(-0.15)	(-0.65)	(-0.81)	(-2.45)	(2.06)	(-0.96)
Bank Loan Dummy	0.044*	0.061***	0.013	0.568	0.087*	0.130	0.057		0.000	-0.073*	0.027	0.039
	(1.92)	(2.78)	(0.25)	(1.03)	(1.85)	(0.86)	(1.60)		(0.00)	(-1.70)	(0.57)	(1.20)
Control variables are: Log(firm asset), log(age), Dummy(state ownership), Dummy(16~100 competitors), Dummy(>100 competitors), Dummy(missing Competitor inf), underground financing, other financing, industry fixed effect												
Observations	941	1,484	918	510	468	118	616	341	368	1,280	576	1,053
R-squared	0.04	0.07	0.02	0.06	0.12	0.08	0.04	0.07	0.10	0.06	0.06	0.03

Panel B: Underground financing and firm growth

	Banglades h	Brazil	Chile	Egypt	Indonesia	Pakistan	Philippines	South Africa	Sri Lanka	Thailand	Turkey	Vietnam
Stage 1: the determinants of using underground financing												
Financing Access	0.009**	0.033***	0.004***		0.018*	-0.019	0.015***		0.004	0.014***	0.003	0.009***
as constraint	(2.20)	(6.23)	(2.62)		(1.75)	(-0.64)	(4.59)		(1.10)	(4.03)	(0.59)	(3.47)
Bank Loan Access	0.003	-0.038**	-0.010**		-0.080**	0.046	0.029**		0.012	0.002	0.003	-0.014
	(0.33)	(-2.36)	(-2.34)		(-2.50)	(0.51)	(2.18)		(1.02)	(0.16)	(0.17)	(-1.49)
Control variables are: Log(firm asset), log(age), Dummy(state ownership), Dummy(16~100 competitors), Dummy(>100 competitors), Dummy(missing Competitor inf), industry fixed effect												
Observations	846	1,484	685		452	69	608		199	1,277	232	932
Psuedo R-square	0.09	0.08	0.28		0.11	0.15	0.18		0.28	0.11	0.1	0.13
Stage 2: Underground financing and firm growth												
Underground	-0.135*	-0.070**	-0.260		0.096	-0.029	-0.010		-0.212**	-0.047	0.126	0.023
Financing	(-1.68)	(-1.99)	(-1.49)		(1.15)	(-0.26)	(-0.14)		(-2.26)	(-1.06)	(1.51)	(0.25)
Bank Loan Access	0.044*	0.056***	-0.030		-0.037	-0.028	0.048		-0.205*	-0.047	-0.011	-0.005
	(1.93)	(2.58)	(-0.56)		(-0.36)	(-0.42)	(1.47)		(-1.70)	(-1.11)	(-0.16)	(-0.13)
Control variables are: Log(firm asset), log(age), Dummy(state ownership), Dummy(16~100 competitors), Dummy(>100 competitors), Dummy(missing Competitor inf), underground financing, other financing, industry fixed effect												
Observations	846	1,484	685		452	69	608		199	1,277	232	932
R-squared	0.05	0.07	0.02		0.11	0.17	0.04		0.07	0.06	0.08	0.03