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Information Sharing in Trade Credit Markets: Evidence from Kenyan Retail Shops

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Abstract

In developing countries financial frictions hinder firm growth. Credit constraints result from poor contract enforcement and asymmetric information in the credit market. One solution is to provide infrastructure for lenders to share information on borrowers' credit history, which can mitigate adverse selection and improve repayment incentives, reduce resource misallocation and accelerate firm growth. Information flow facilitates informal enforcement which may be particularly important in an environment where formal (legal) enforcement is weak. I investigate the barriers to and impact of introducing an information sharing service for small and medium enterprises (SMEs) and their trade credit providers (suppliers) in the retail sector in Kenya, by means of randomized information intervention and subsidy of take-up. I focus on borrowers and lenders' decisions to adopt and share information, as well as the impact of the service in reducing information asymmetry, increasing borrowers' repayment incentives, buyer-supplier relationships and spillover among retail shops. I find that offering free credit reports to retail shops increases credit report ownership and knowledge, as well as shops' likelihood of applying for supplier credit, but not access to supplier credit. Lack of response from the supplier side seems driven by their unwillingness to rely on information in the credit reports as well as some suppliers' lack of ability to provide credit.

1 Introduction

Financial frictions contribute to slow firm growth, misallocation and low aggregate productivity in developing countries (Rajan and Zingales, 1998; Hsieh and Klenow, 2009; Buera et al., 2011). Despite high returns to capital firms often face credit constraints (Udry and Anagol, 2006; De Mel et al., 2008; McKenzie and Woodruff, 2008; Fafchamps et al., 2014). In the formal banking sector firms are often credit rationed due to stringent collateral requirements and inflexible credit limits (Banerjee and Duflo, 2014).

Apart from financial institutions, firms could borrow informally from other sources. Trade credit provided by suppliers is an important form of firm financing and widely used by firms in developed countries.[1] A few reasons may explain why suppliers lend to buyer firms, including their relative advantage in information and enforcement compared to financial institutions (e.g. obtaining more information on borrowers through transactions with them), price discrimination, and transactions cost.[2] Furthermore, there is evidence that in the US firms borrow more from suppliers when they have more difficulty borrowing from financial institutions, suggesting that trade credit could be a substitute for bank credit.[3]

Fisman and Love (2003) show that the lack of bank financing is mitigated by trade credit provision in countries with underdeveloped financial markets. However, there are reasons to think that the allocation of trade credit is far from efficient in developing countries and firms are still much more credit rationed on this front than those in developed countries, due to the combination of enforcement and information problems.

Developing countries have much less effective legal systems to enforce contracts compared

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[1]In the United States, small businesses rely on trade credit for about 60 percent of their external finance (Mach et al., 2006). Mian and Smith (1994) report that "for the 3500 non financial Nasdaq firms covered by COMPUSTAT, accounts payable were 26 percent of corporate liabilities, at the end of 1992." Rajan and Zingales (1998) report that accounts payable amounted to 15 percent of the assets for a sample of nonfinancial US firms on Global Vintage while debt in current liablities accounted for just 7.4 percent.

[2]For a review see Petersen and Rajan (1997).

[3]Petersen and Rajan (1997) show that among small firms in the United States, those with less well-established banking relationships held significantly higher levels of accounts payable. Nilsen (2002) shows that during monetary contractions, small firms, which are likely to be more credit constrained, react by borrowing more from their suppliers.

to developed countries. In this setting information is important in two ways: it can facilitate informal contract enforcement by increasing repayment incentives, and it can reduce adverse selection by revealing information about borrower type.

First, information can help sustain informal contract enforcement. Repeated bilateral interaction sustains cooperation, as the fear of losing the current relationship deter parties from opportunistic behavior. However when there are multiple sources of lending (which is likely the case in realistic settings), bilateral punishment may not be enough since a borrower can default, run away and borrow from another lender. Multilateral punishment where lenders collectively punish borrowers who have defaulted can help sustain cooperation and achieve efficiency gain over bilateral punishment by providing more incentive to cooperate.[4] Clearly the flow of information on borrowers' behavior among lenders is necessary for this to work. Without information flow, we are back to the case of bilateral punishment: it is more difficult to sustain cooperation (Raub and Weesie, 1990), and even if that is achieved, relationships are characterized by gradual trust building and it could take a long time for full cooperation to be attained (Datta, 1996; Ghosh and Ray, 1996, 1999).

Apart from facilitating informal enforcement, information flow is also important is in a context where borrowers have hidden types that affect their probability of repayment (e.g. productivity, patience) and lenders can learn about the types of the borrowers from their past history. Stiglitz and Weiss (1981) show that when adverse selection is severe there will be credit rationing in equilibrium. Information sharing among lenders could reduce the amount of information asymmetry and increase lending (Pagano and Jappelli, 1993).

Credit bureaus facilitate information flow in the credit market, but both consumer and commercial credit bureaus are much less utilized in developing countries compared to developed countries.[5]

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[4]The theoretical point is illustrated by Kandori (1992). Historical examples include the "coalition" of Maghbiri traders (Greif, 1993) and the system of private judges used by early Medieval European merchants (Milgrom et al., 1990).

[5]Consumer credit bureaus collect individual consumer's credit history. The coverage of population by either private credit bureaus or public credit registries is 77.8% for high income countries, and 34% for low and middle income countries, accord-

Despite low levels of credit bureau presence, trade credit providers could in principle share information informally among themselves to achieve multilateral punishment and faster learning of borrwer types. This happens to some extent,[6] however it is mostly restricted to business networks,[7] causing less connected or younger firms to have a disadvantage in accessing trade credit and potentially leading to the exclusion of some ethnic groups. Suppliers gather information on potential borrowers by investigating and visiting borrowers. However, given the cost of screening and monitoring there could be too little lending.[8]

Information gathering by one supplier is costly hence they may not have the incentive to provide public goods by sharing it: suppliers can lose competitive edge by revealing good borrowers and attracting more competition for them. Given this, truthful information sharing may only be possible in close knit communities where communication and sanctions are easier to implement.[9] Milgrom et al. (1990) shows that a formal institution, the system of private judges enforcing the private code of commercial law, supported information sharing and multilateral punishment among early Medieval merchants in Europe in the absence of state enforcement of contracts, partly by lowering cost and providing incentive for information transmission.[10]

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ing to World Bank Indicators (http://data.worldbank.org/indicator/IC.CRD.PRVT.ZS., http://data.worldbank.org/indicator/IC.CRD.PUBL.ZS). Commercial credit bureaus collect firm's credit history. In the US major commercial credit bureaus that supply information on potential borrowers to trade credit providers include Dun and Bradstreet, Experian, Equifax, TransUnion, Cortera; the largest one, Dun and Bradstreet, says they have business credit information on more than 240 million companies from 30000 data sources, updated 5 million times per day, serving more than 34000 companies (https://businesscredit.dnb.com/m/about-us.html). McMillan and Woodruff (1999) and Fafchamps (2004) find that most firms in Vietnam and Sub-Saharan Africa did not utilize commercial credit bureaus to obtain information on potential borrowers.

[6]Among firms studied by McMillan and Woodruff (1999) 12 percent talk with other suppliers of the customer at least monthly.

[7]Especially among the Kenyan firms studied by (Fafchamps, 2004) where business people of South Asian descent often have business networks separate from others.

[8]Aleem (1990) studies informal rural credit markets in Pakistan and finds that moneylenders spends significant time and resources on screening, monitoring and debt collection. Give that trade credit providers are suppliers who have other main business, they likely do not devote as much effort on providing trade credit.

[9]Examples include the Chinese in Southeast Asia (Rauch and Trindade, 2002), South Asians in East Africa (Fafchamps, 2004), and historically the Maghbiri traders (Greif, 1993).

[10]In addition to showing that multilateral punishment is an equilibrium, they do not take the incentive to share information as granted and show that the system makes it incentive compatible for cheated agents to report the incident.

In this paper, we test whether introducing the infrastructure for formal information sharing in a developing country increases information sharing and credit provision. We address this question in the context of small and medium enterprises (SMEs) in the retail sector in Kenya. SMEs employ a large fraction of the population in developing countries, yet they face more credit constraints than larger firms due to the severity of asymmetric information (McKenzie and Woodruff, 2008; Teima et al., 2010). Even though many developing countries including Kenya recently introduced credit information sharing among financial institutions,[11] not many SMEs are covered by credit bureaus since few borrow from banks despite owning a bank account.[12] Their borrowing from informal sources including suppliers is not recorded in their credit history by default, since information sharing by credit providers other than financial institutions is not mandated by law. In the US, trade credit providers voluntarily subscribe to services by commercial credit bureaus to access credit history information (including bank and trade credit) of customers, and submit information on trade credit given to customers in return. We introduce a similar service to retail sector SMEs and their suppliers in Kenya which essentially lowers the cost of truthful information sharing.

We aim to understand the barriers to and impact of introducing formal information sharing in the trade credit market. Our setting, Kenyan retail shops of fast moving consumable goods, is a ubiquitous sector in Sub-Saharan Africa characterized by a large number of small retail shops as well as low levels of trust and trade credit provision between retail shops and their suppliers. Working with a credit bureau in Kenya,[13] we introduce formal credit information sharing on both the supplier and the buyer sides. On the former, we subsidize

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[11]Kenya passed the Banking (Credit Reference Bureau) Regulations in 2008 which requires that starting February 2009 all financial institutions share information (positive and negative) on all loans with credit reference bureaus licensed by the Central Bank (https://www.centralbank.go.ke/index.php/bank-supervision/credit-reference-bureaus).

[12]According to Teima et al. (2010), in 2010 close to 76 percent of formal SMEs in emerging markets have a banking relationship via deposit/checking accounts, while only about 35 percent have access to bank credit.

[13]All three credit reference bureaus licensed by the Central Bank of Kenya are private companies. The one we work with runs a commercial credit bureau and provides services to SMEs in addition to functioning as a credit reference bureau (collecting information on all loans from financial institutions).

suppliers' subscription to the trade credit bureau database. In the database suppliers can access credit history of retail shops they supply or could potentially supply to (shared by other trade credit providers and banks) and in return submit information on trade credit given to customers. On the latter, we conduct a randomized control trial on retail shops who buy from the suppliers. In one treatment arm we offer information of and subsidy for a credit bureau service where an SME can receive a credit report on their business and use it to apply for credit from suppliers and banks. This allows us to identify the effect of having access to credit reports. In another treatment arm we inform shop owners of the fact that we invited suppliers to join the credit information sharing service, without offering subsidy for SMEs to get credit reports.

This design enables us to answer a few questions. First, we would like to understand whether there are barriers to introducing a trade credit bureau to this context. We hypothesize that retail shops demand credit reports which can potentially help them reveal positive information to suppliers and access more credit, and take-up should be high due to the subsidy. However, there are some reasons that could lead to low take-up: unfamiliarity with a new service and low demand for credit. By looking at take-up decisions we can find out whether retail shop owners value credit reports and and how they self-select into adoption by business characteristics. By looking at report utilization after they receive it we can learn about their revealed demand for credit (including trade and bank credit). Similarly, suppliers' willingness to join is also ex ante unclear due to conflicting incentives: the benefit of accessing information submitted by others and the cost of sharing information on their own customers. There may also be little trust in the credit bureau, or insufficient demand if they were content with the current level of informal information sharing among themselves.

The second set of questions concern the impact of information sharing on the trade credit market, in particular whether it mitigates adverse selection and increases repayment incentives as hypothesized by the theoretical literature. We can find out whether it reduces information asymmetry by looking at whether access to credit report help retail shops with

a good credit history access more credit from suppliers and/or banks. The duration of time it takes for a retail shop to buy from a supplier before getting credit is also informative of the amount of information asymmetry and supplier's screening cost. We can also find out whether knowledge of information sharing increases borrowers' repayment incentive by looking at the repayment behavior of the retail shops given only information about the existence of the credit bureau and its take-up among suppliers, but not the subsidy (thus not the credit reports).

The third set of questions concern the broader impact of introducing information sharing. We look at spillovers from shops that are given access to credit reports on neighboring shops who did not, in particular two types of effects: business outcomes (credit access, business stealing) and information spillover (on knowledge of credit information sharing). We also look at the impact of increased access to credit on firm performance: if indeed some shops access more credit due to the intervention, how it causes firms to expand.

We find that at baseline, retail shops' borrowing from banks is limited. Access to regular supplier credit is even rarer, even though on average the retail shops have been buying from their main suppliers for four years. Many shop owners report liquidity as a main challenge in running their business and would like to borrow more. Very few own a credit report or know what it is. This suggests potential demand for credit reports and supplier credit.

Suppliers report giving credit to very few retail shop customers, even though most are regular customers and many have asked for credit. Suppliers rely on their own interactions with a customer, own investigation and personal relationships in deciding whether to give out trade credit. There is some degree of informal information sharing suppliers on customers' behavior. Few have heard of credit bureaus, and none is using their service. There is some interest in understanding customers' credit history with other lenders and making credit decisions accordingly, but also some reluctance in giving credit to a first-time customer. Some suppliers say they would be able to give out more credit if they found more qualifying customers. Ex ante it seems unclear whether credit reports for retail shops can convince

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suppliers to give (more) credit to some of them, since it depends on suppliers' trust in a product which is new to most of them (credit reports).

In terms of adoption of credit bureau services, most retail shop owners who were offered credit reports signed up to receive one for free (with our subsidy). Suppliers show less interest: for wholesalers who are SMEs themselves, we offered them the same SME credit reports, but less than half signed up, potentially due to them being less borrowing constrained and seeing it as less of a priority. For distributors, we offered them free subscription to the supplier information sharing service, and even though seven out of eleven distributors attended a meeting we organized, and four expressed interest, eventually only two managed to sign up. This could be due to lack of interest from suppliers' in more information sharing on customers, lack of interest due to the lack of other suppliers' participation and sharing information (which would make the service more useful), or cost involved in adopting a new technology.

At endline, offering credit reports to retail shop owners caused a significant increase (39 percentage points) in credit report ownership from a very low baseline level, as well as increase in knowledge on what a credit report is, though this increase is lower than expected (19 percentage points). We find no effect of the treatment on the likelihood that retail shop owners believe their repayment behavior may be reported by their supplier. This could either be due to this information being not remembered as it was less directly related to the credit report itself, or respondents correctly anticipating suppliers' rarely signing up for the CIS service. Accordingly, there is no impact on their self-reported default behavior.

Shop owners offered a credit report were more likely to ask a supplier for credit when compared to pure control shops. Those offered a credit report were more likely to volunteer to show them their credit report in this process (7.1 percentage points). However, this did not lead to an increase in access to supplier credit. This is the case even for shops who got credit from some but not all supplier at baseline, which are the ones we expected to benefit the most from credit reports (since they had positive information to reveal and were

"undervalued" by some suppliers who weren't giving them credit). Similarly, offering credit reports to retail shops did not have any significant impact on downstream business outcomes.

Shops in the vicinity of those offered a credit report, but were not offered one themselves, were also more likely to ask suppliers for credit (the magnitude of the latter is similar to the effect of being offered a credit report). This could be due to information on credit reports spreading from those offered a report to neighboring shops. However, based on the lack of increase in credit report knowledge or ownership among spillover shops, this seems unlikely. It may be that these shops became aware of nearby shops (those offered a credit report) going to suppliers and asking for credit and followed suit. They also experienced higher access to supplier credit at endline, even compared to shops that received a credit report, though we think this is explained by a combination of 1) asking for more supplier credit, 2) one of the major suppliers losing trust in credit report and hence penalizing those who asked for credit with a report. There was also no significant impact on downstream business outcomes. Shops that received only information on credit reports and credit information sharing services for suppliers showed no increase in credit report ownership, knowledge, access to trade credit and downstream business outcomes, indicating that simply giving information to shop owners does not change behavior in the above ways.

We turn to supplier outcomes to understand why credit reports did not help retail shops access more trade credit despite making them ask for it more. At endline, suppliers (both distributors and wholesalers) have much higher knowledge and adoption of credit bureau services, though we cannot causally attribute to our study. However, even though suppliers think information in credit reports is accurate, they seem reluctant to rely on it to decide whether to give credit to a retail shop customer. Another possible explanation is that suppliers are not able to give out more credit to qualifying customers since they themselves are credit constrained. This is more plausible for wholesalers than distributors, since at baseline the majority of distributors, and a minority of wholesalers, say they are able to give more trade credit if there were more qualifying customers, and also only a small number of

distributor say they wish to borrow more than they currently do while all wholesalers say so.

Even though offering credit reports to retail shop owners causes more of them to own credit reports and ask for trade credit from suppliers, it does not improve access to trade credit even among shops which we expected to benefit the most (those getting credit from some but not all suppliers at baseline). This lack of response from the supplier side seems to come not from suppliers' distrust of the accuracy of the credit reports, but rather their skepticism on the usefulness of credit reports in predicting how well a customer will repay them, as well as the inability to give out credit – the latter more so among wholesalers (smaller suppliers) than distributors (larger ones). Hence credit reports are not able to reduce information asymmetry in our context. Nor is it able to improve repayment incentive, due to suppliers not adopting the formal credit information sharing system, and shops either correctly anticipating this or not remembering information on this that we gave to them during intervention.

Apart from the above, another barrier to introducing credit bureau service to a context where it is new is the quality of the credit bureau service itself. Even though at endline retail shop owners are mostly satisfied with the accuracy of the reports (after reconciling alleged errors), and suppliers think they are accurate, we cannot rule out the possibility that the errors and delays by the credit bureau have discouraged some retail shop owners from using their reports. In the future, even if suppliers become convinced to utilize information in the reports to make credit decisions, quality of the credit bureau service is still crucial to ensure trust from retail shops and suppliers in the long term.

This paper is related to the literature on information sharing in credit markets. On the theoretical side, Pagano and Jappelli (1993) shows how information sharing can mitigate adverse selection in credit markets, and Padilla and Pagano (2000) focuses on moral hazard. On the empirical side, Jappelli and Pagano (2002), Brown et al. (2009) and Djankov et al. (2007) find that information sharing in credit markets is associated with more lending on the

firm and country level. Closely related to this paper is De Janvry et al. (2010) which analyzes an experiment where a Guatemalan microfinance lender graduatelly rolled out the use of credit bureaus across its branches and randomly selected groups of borrowers were informed about it, finding that both adverse selection and moral hazard were reduced. We add to the literature by studying barriers to introducing information sharing and agents' incentives to adopt, which is crucial for the *trade credit* context since unlike financial institutions information sharing by trade credit providers is voluntary and barriers to adoption could prevent transition to a potentially welfare improving equilibrium.

This paper is also related to the literature on relational contracting and informal contract enforcement in developing countries (McMillan and Woodruff, 1999; Fafchamps, 2004; Deb and Suri, 2013; Casaburi and Reed, 2013; Blouin et al., 2013; Ghani and Reed, 2014; Sanchez de la Sierra, 2014; Macchiavello and Morjaria, 2015). Finally this paper is related to the large literature on identifying barriers to firm growth in developing countries, including credit (De Mel et al., 2008; McKenzie and Woodruff, 2008; Fafchamps et al., 2014; Banerjee and Duflo, 2014; Banerjee et al., 2015), managerial capital (Bloom et al., 2013; Bruhn et al., 2018; Karlan et al., 2015; Kremer et al., 2016; Beaman et al., 2014; Anderson-Macdonald et al., 2014; Drexler et al., 2014), and labor market frictions (Hardy and McCasland, 2015; Cohen, 2016).

2   Context and Experimental Design

2.1   Context

The study focuses on small retail shops of fast moving consumable products in Kenya. In this sector shops are small and usually located in vicinity to one another, often selling very similar products and buying from the same suppliers, and hence constraints on borrowing, including supplier credit, seem ex ante to be a plausible constraint on business growth. These small shops sell a wide variety of products. Their main products are everyday con-

sumable products (flour, sugar, cooking oil, tea, etc.),[14] and for these they rely on two types of suppliers: distributors and wholesalers. Distributors are larger firms which buy various products directly from manufacturers and then distribute to downstream buyers (including retail shops and wholesalers). Wholesalers are typically large retail shops which buy various products from distributors (and sometimes manufacturers) and sell to both retail shops and consumers. Even though wholesalers usually sell to retailers at a markup relative to distributors, retailers sometimes buy from wholesalers for convenience as there are wholesalers in every town, as opposed to distributors which are mostly located only in large towns. Apart from everyday consumables, the retail shops also sell other products (e.g. stationaries, phone cards, Coca Cola), which they get from the same distributors or wholesalers, or specialized suppliers. In our study we examine the relationship between retail shops and their main suppliers, i.e. wholesalers and distributors.[15]

2.2   Sample Selection

The study took place mostly in one county in Western Kenya. We located 998 retail shops in the study area.[16] Out of these, 37 refused to participate in the study. We also excluded shops

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[14]There is demand for such shops in residential neighborhoods, as supermarkets are only located in town centers and transportation is time consuming due to poor road conditions; these shops typically sell products at smaller quantities than supermarkets (though at a markup), which is preferred by consumers with liquidity constraint.

[15]Compared to developed countries where manufacturers often distribute directly to supermarket chains which sell to consumers, in our context the sector has more layers of intermediaries (wholesalers and suppliers), similar to other sectors in developing countries like agricultural trade (Fafchamps, 2004). This could be due to lack of expansion of supermarket chains (due to frictions in credit, labor, transportation, regulation etc., or lack of demand from low income consumers) and the resulting need for local retailers and intermediaries that specialize in distributing a bundle of products. Similarly, given the existence of distributors, the seemingly redundant existence of wholesalers could be because small retail shops cannot get all they need from large distributors at once (due to credit, transportation, labor, time or storage constraints) and sometimes resort to local suppliers to cope with demand shocks (Kremer et al., 2016). Layers of intermediaries could increase markup and price paid by consumers (see Atkin et al. (2015) for an example of a large retail chain reducing prices relative to small local retail shops).

[16]Small retail shops in Kenya differ in their degree of formality. The most informal ones, "kiosks", are shops located in structures built with corrugated metal sheets. We excluded kiosks from our study, as they are more likely to be informal, and formality was a requirement to be eligible to get an SME credit report with the credit bureau. Hence we do not examine informality itself as a barrier to accessing credit or information sharing. We worked with shops that were located in building structures, commonly referred to as "dukas", similar to the ones studies by Beaman et al. (2014) and Kremer et al. (2016).

that were established less than a year prior to when we first surveyed them (because the credit bureau required shops to have been in business for at least one year before applying for an SME credit report; there were 201 such shops), 66 businesses with more than one branches (as they were more established, and it would be more difficult to collect their business outcomes through survey), 30 that did mostly wholesale rather than retail (which we included in the sample of wholesalers), and 25 whose owner planned to leave business soon (there were some overlaps in the above categories). We were left with 659 eligible retail shops whose owners agreed to participate in the study. We tracked their main suppliers of fast moving consumable products and found 11 distributors and 56 wholesalers serving retail shops in the area.

2.3 Intervention

We worked with a company which was one of the three licensed credit references bureaus in Kenya. Kenya passed the Credit Reference Bureau Regulation in 2008 which mandates all bank and micro-finance institutions to share positive and negative information on all loans with licensed credit reference bureaus. Apart from being a credit reference bureau, our partner company also provided a service of credit rating and reporting on SMEs. If an owner of an SME signs up to this service, the credit bureau would send someone to visit the business to collect information which they then use to generate a credit report on the business. The report contains basic information (owner, location, lines of business, history of business, sales, expenditures etc.) and their history of trade and bank credit (information on bank loans is already in the credit bureau's database due to mandated information sharing by banks; information on trade credit is collected by asking business owners, though to ensure truthfulness the self-reported information is then verified with the relevant suppliers). The report also includes a credit rating assessment on the business. The report is valid for one year after it is created. An example of an SME credit report is included in the appendix.

In addition the credit bureau also provided a service for lenders aiming to facilitate

information sharing among them, called Credit Information Sharing (CIS). It includes a database of information on lending made by lenders who subscribe to the service (including credit terms and repayment by borrowers) to individuals and firms in Kenya. Financial institutions are required by law to share such information with credit bureaus, and hence their lending information is automatically included in the database; in addition, some other lenders in Kenya (e.g. utility companies, trade credit providers) subscribe to the service on a voluntary basis. Subscribers submit information in return for access to the database.

To understand the barriers to and impact of introducing formal information sharing in this trade credit market, we introduced it on both the supplier side (distributors and wholesalers) and the buyer side (retail shops, henceforth referred to as shops) in the following fashion:

Suppliers For large suppliers, i.e. the 11 distributors, we introduced to them the CIS service (see description above.) We offered to sign them up to the service and fully subsidize the subscription fee.[17] We also organized training for suppliers (both distributors and wholesalers) on how to assess SMEs based on their credit reports. For the 56 wholesalers who were SMEs themselves, we also invited them to sign up for the same credit bureau service that we introduced to retail shops (see below).

Retail shops Ultimately we want to look at the impact of increasing sharing of credit information on borrowers, which are retail shops in our context. An environment with more credit information sharing has two main differences with the status quo: lenders are better able to distinguish among potential borrowers using information on their credit history, and borrowers have more incentive to repay. We attempt to introduce the two mechanisms separately by randomly assigning shops to three treatment arms:

1. **Credit report** For shop owners in this treatment, we offered them to get a credit report on their business for free, which they can use to apply for credit from suppliers; we

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[17]There was a one time fee of 15,000 Kenyan shillings, or about 150 USD. We did not subsidize wholesalers to join as there were too many of them, and most of them did not have the sophisticated accounting system required.

also informed them that we offer suppliers the option to share credit information with one another. Hence we simultaneously introduced both mechanisms above. Specifically, we visited retail shops, introduced them to the SME Credit Reporting service by the credit bureau, and offered full subsidy for a one-year subscription.[18] We also told them that we invited the local suppliers to subscribe to CIS which would facilitate their sharing credit information with one another. If a shop owner signed up to the SME credit report service, after the credit bureau collects information from them (including information on bank loans and trade credit) and generates a report, we would visit the shops to deliver the reports and explain how to use them; if there are errors or disputes, we would ask the credit bureau to investigate and correct them.[19]

2. **Information-only** We gave shop owners the same information (on the SME Credit Reporting service and on suppliers being invited to join CIS) without offering subsidies for the credit reporting service. Hence we only introduced the second mechanism above.

3. **Control** We did not give any information on credit reports to these shop owners.

2.4 Randomization

Since we were giving some shops access to credit reports, there may be spillover among shops: shops receiving credit reports may access more credit from suppliers, and as a result other shops may face decreased access to supplier credit, which could further lead to business stealing; shops that did not receive information about credit reports may also hear about it from shops that did. In order to account for and measure spillovers, we followed a two stage design similar to Duflo et al. (2003) and Haushofer and Shapiro (2016), where we grouped

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[18]At 3,600 Kenyan shillings, or about 36 USD, if the firm has a license from the county government but is not registered at the National Companies Registry, which is the case for most shops here; at 6,000 Kenyan shillings, or about 60 USD, if the firm is registered at the National Companies Registry.

[19]The main deviation from how the reports are supposed to work (apart from errors in the report) is the following: the credit bureau was supposed to ask shops about their trade credit history with suppliers and then verify it with suppliers, but we learned at some point that they did not verify the information with suppliers, and hence we did it ourselves to ensure the truthfulness of the information in the reports.

shops into clusters and vary treatment intensity at the cluster level:

1. First we grouped shops into clusters based on geographical distance.[20] See Figure 1 for the distribution of clusters in the study area (each pin representing a cluster), and Figure 2 for an example of shops and clusters in a town (each pin representing a shop, and each color representing a cluster).

2. Then we randomly selected 2/3 of the clusters to be treatment clusters, stratified by cluster size (47 out of 67 are assigned to treatment).[21] Within each treatment clusters, we randomly selected 1/2 of shops to receive the "credit report" treatment (we call them "credit report treatment shops", and there are 227 of them); the other 1/2 of the shops in treatment clusters did not receive treatment but are near credit report treatment shops, and we use them to estimate spillover effects (we call them "spillover shops", and there are 238 of them). Shops in the other 1/3 of the clusters did not receive treatment (there are 194 shops in these control clusters'). We will estimate treatment effects including spillovers following the methodology of Haushofer and Shapiro (2016).
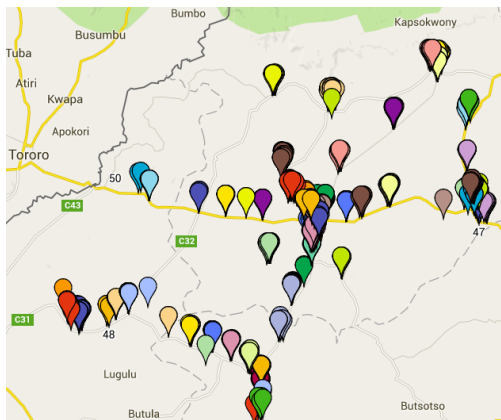
Figure 1: Distribution of clusters in study area

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[20]We used the complete-linkage clustering algorithm, where we grouped nearby shops in the same cluster until the radius of the largest cluster reached 3 km, and generated 67 clusters among the 659 sampled shops (cluster sizes ranging from 1 to 35, with an average of 9.95).

[21]When there are less than 3 shops of a certain cluster size, we grouped them together with the nearest cluster size group until the number of members gets above 3.
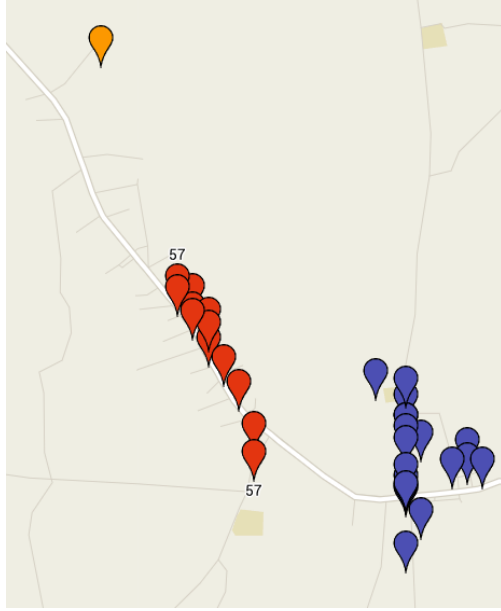
Figure 2: Distribution of clusters and shops in a town

The above description applies to assignment to the "credit report" treatment. For the "information only" treatment, we randomly selected half of the shops in the control clusters to receive it (105 out of 194 shops), the rest (89 shops) received no treatment and are considered "pure control" shops. [22] In the analysis of the treatment effect of the credit report itself, we compare "credit report treatment shops" and "spillover shops" to "pure control shops"; in the analysis of the treatment effect of knowledge on credit information sharing without the credit report itself, we compare "information-only treatment shops" to "pure control shops".

2.5 Research Questions and Hypotheses

This section outlines research questions and hypotheses in cases where we have a clear hypothesis ex ante.

1. Do retail shop owners demand credit reports?

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[22]In theory "pure control" shops could be subject to information spillover from nearby "information-only" shops. We still chose this design to increase the power of the "information-only" treatment, as our prior was that the information spillover effect fro the "information-only" shops to "pure control" shops would be weak.

Take-up should be high since the reports are free due to full subsidy. Retail shops with more positive information to reveal (i.e. with good trade credit history) should be more likely to self-select into adoption than the rest.[23]

2. Do credit reports help retail shops access more supplier credit?

   We hypothesize that given the current barriers to information sharing among suppliers, many shops that are "creditworthy" access limited supplier credit, and hence credit report as a credible way of revealing shops' creditworthiness should help them access supplier credit. Of course this depends on not only take-up of the report among shops, but also suppliers' trust of information in the reports and whether they find it informative for trade credit decisions. Also, if suppliers update positively on retail shops' creditworthiness based on credit reports, we expect this to happen to a greater extent for shops that are creditworthy but "undervalued" by some suppliers. We proxy this by whether the shop accessed credit from some but not all suppliers at baseline (107 out of 659 shops in the sample). We expect the treatment effect of credit reports to be positive for these shops, and positive but smaller in the full sample.

3. Does being offered a credit report increase knowledge of credit information sharing and decrease default?

   Since during out intervention we will explain to shop owners the nature of credit reports and credit information sharing among suppliers, including the information sharing platforms we will introduce to suppliers, we expect the intervention to increase knowledge of credit reports, awareness of suppliers' information sharing, and potentially decrease default at endline. Though it is unclear whether we can detect an effect on default since these events are rare.

4. Do credit reports affect downstream business outcomes for retail shops?

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[23]We are not assessing demand for credit reports in general as we try to maximize take-up to look at its treatment effect. Retail shops demand credit reports as they can help them credibly reveal positive information to suppliers, but demand in the absence of subsidy is unclear since this is a new product.

If they increase access to supplier credit, we may observe improvement in downstream business outcomes of retail shops, e.g. revenue and profit.

5. Do offering credit reports to some retail shops generate spillover effects?

There are a few channels of spillover effects: knowledge on credit reports, demand for credit reports, access to supplier credit and other business outcomes. Untreated shops near shops that received an offer of credit report may learn about it, have better knowledge on credit reports and credit information sharing, and come to demand credit reports. If more treated shops than nearby untreated shops own credit reports and they help with access to supplier credit, treated shops may crowd out access to supplier credit among nearby untreated shops who share suppliers. They may also expand their business and steal customers from nearby untreated shops.

6. Does offering some retail shops information on credit reports and suppliers' credit information sharing increase knowledge on these topics and decrease default?

We expect retail shops who are given this information (without being offered credit reports) to increase related knowledge and potentially default less often. Though it is unclear whether such improvement in knowledge will persist and whether we have enough sample to detect any effect on default.

7. Do suppliers demand a credit information sharing product for suppliers?

We also offer suppliers a product which enables them to share information on customers' repayment of trade credit with one another. Suppliers' incentive to join is ex ante unclear: they could benefit from more information on customers, but it is an empirical question whether that outweighs the cost of submitting information they gathered themselves. In addition, there might be little trust in the credit bureau, or insufficient demand if they were content with the current level of informal information sharing among themselves.

2.6　Data and Timeline

During July to September 2015 we conducted baseline survey on 659 retail shop owners and a subset of their suppliers (5 of the 11 distributors and 9 of the 56 wholesalers). The intervention lasted from September 2015 to January 2017, and was composed of the following steps: we visited credit report treatment shops and offering to sign them up to get a free credit report during September to November 2015, the credit bureau collected information on credit report treatment shops who signed up in order to make credit reports during October to December 2015, we delivered credit reports to credit report treatment shops who signed up (including verifying information in the reports, sending back to the credit bureau for correction of errors, and collecting and verifying trade credit information) during December 2015 to July 2016. During this process, we also explained to shop owners how they could use this report to apply for supplier credit and that we had trained some of the suppliers, though we did not mention bank loan, and most of the banks had not partnered with the credit bureau to recognize their SME credit report at the time. We called information-only treatment shops to deliver information from November 2016 to January 2017. Finally, we conducted endline survey on retail shops during March to May 2017, and endline survey on suppliers during September to October 2017.

Figure 3: Timeline

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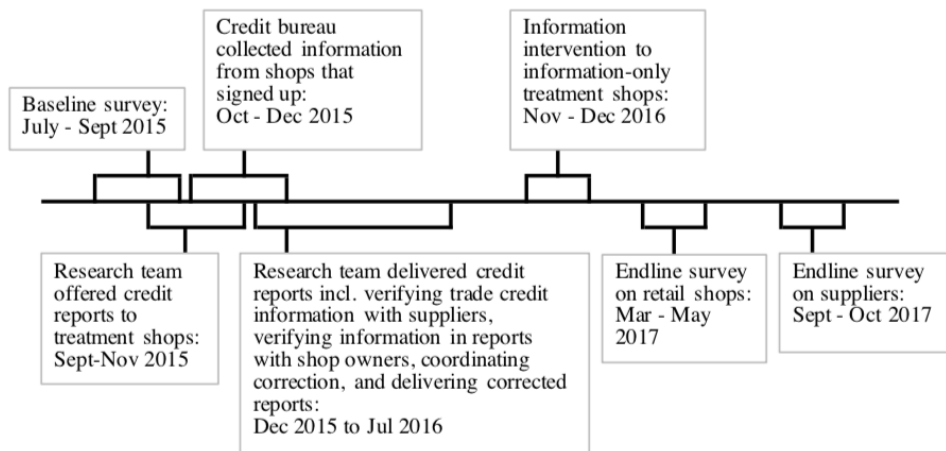
2.7 Sample Characteristics: Retail Shops

Table 1 to Table 5 present background characteristics of retail shops and their owners from the baseline survey. Column 1 shows means from the pure control group, column 2 shows the difference between credit report treatment shops and pure control shops, column 3 shows the difference between spillover shops and pure control group, column 4 shows the difference between credit report treatment shops and all control shops (pure control and spillover), and column 5 shows the difference between information-only treatment shops and pure control shops.[24]

The regression specifications for columns 2 through 5 are the following:

$$y_{ij} = \beta_0 + \beta_1 T_{ij} + \beta_2 \alpha_j + \epsilon_{ij} \tag{1}$$

where y_{ij} is the baseline outcome of interest for shop i in cluster j, T_{ij} is a treatment indicator that depends on the regression specification (see below), α_j indicates fixed effects (see below), and ϵ_{ij} is the error term, clustered at the appropriate level. The specific combination of treatment indicator, fixed effects, and clustering of standard errors are:

- Column 2 (credit report treatment effect): the regression is run on credit report treatment shops and pure control shops, T_{ij} equals 1 if a shop is a credit report treatment shop and 0 otherwise, fixed effects are at the strata level (since randomization of clusters is stratified by cluster size) and standard errors are clustered at the cluster level (since credit report treatment shops and pure control shops are always in different clusters and treatment is at the cluster level).

- Column 3 (spillover effect): the regression is run on spillover shops and pure control shops, T_{ij} equals 1 if a shop is a spillover shop and 0 otherwise, fixed effects are at the strata level (since randomization of clusters is stratified by cluster size) and standard

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[24]Throughout the paper we convert monetary values to US Dollars using the exchange rate in July 2015 when the baseline survey started.

errors are clustered at the cluster level (since spillover shops and pure control shops are always in different clusters and treatment is at the cluster level).

- Column 4 (information treatment effect): the regression is run on information-only treatment shops and pure control shops, T_{ij} equals 1 if a shop is an information-only treatment shop and 0 otherwise, fixed effects are at the cluster level (since information-only treatment shops and spillover shops are sometimes in the same clusters) and standard errors are not clustered (since here treatment is at the individual level).

- Column 5 (pooled treatment effect): the regression is run on credit report treatment shops, spillover shops, information-only treatment shops and pure control shops, T_{ij} equals 1 if a shop is a credit report treatment shop and 0 otherwise, fixed effects are at the cluster level (since credit report treatment shops and spillover shops are in the same clusters) and standard errors are not clustered at the cluster level (since treatment shops and spillover shops are sometimes in the same clusters).

Nearly 66 percent of respondents had at least some or completed secondary school, and almost all had some or completed primary school. The shops had been open for more than four years on average, and about 77 percent were owner-operated and had no employee. Less than half kept some kind of written records, though credit report treatment shops were more likely to do so than pure control shops. Even fewer (less than a third) had systematic business records or calculated profit or loss. Over 90 percent of businesses were formal (i.e. registered with the county). The average self-reported sales from the past month is over 1,800 USD, though only a minority of shop owners (236 out of 659) were able to respond to this question. Hence we also asked them about the total monthly purchase value of consumable products from main suppliers as a proxy for sales (which was done by asking about each main supplier), and the average is about 1,400 USD (correlation with sales for those who reported both: 0.66). We asked respondents to self-report profit from the past month, and got an average between 100 and 200 USD, though again only 238 out of 659 respondents

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could respond. We also calculated profit by subtracting reported expenditures (of various categories, not accounting for labor cost) from reported sales for the past month and got a higher value of above 300 USD.

In terms of financial access, about 70 percent had a bank or microfinance account. Only about 36 percent had taken a loan for their business from a bank or microfinance institution, even though over 68 percent said that they knew how to apply for a loan for their business from a bank or microfinance institution, and more than 80 percent owned land (with more than 65 percent owning a title deed of the land which can be used as collateral). When asked whether they wished they could borrow more from a financial institution than they currently did, about 59 percent of respondents said yes. When asked an open ended question about the main challenges of running their business, about 73 percent of respondents mentioned lack of funds. When asked an open ended question about what they would do if they had an extra 10,000 Kenyan shillings (about 100 USD), about 68 percent of respondents said they would invest in this retail shop. These suggest that these retail shops may be borrowing constrained.

Shops had on average slightly below two main suppliers of consumable products. Despite having been in a business relationship with the suppliers for about four years on average, less than 30 percent of shops had ever gotten credit from one of their main suppliers of fast moving consumable products, and even less got it regularly (credit report treatment shops were more likely than pure control shops to get regular credit from these suppliers). On average less than 10 percent of value of products purchased from these suppliers was made on credit on a regular basis. About 16 percent of shops had delayed or defaulted payment with a supplier.

In terms of ownership and knowledge of credit reports, about 5 percent of respondents said they owned a credit report at baseline. About 9 percent said they knew what a credit report was (including those who owned one; this is likely an overestimate as we did not probe much into their knowledge of credit reports before the intervention), and credit report

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treatment shops were more likely to say so than pure control shops. When asked an open ended question about where suppliers would report default or delay of payment by borrowers, very few people mentioned credit bureau as an option: none among pure control shops, and about 3 percent among credit report treatment shops.

There is imbalance on a number of variables measuring baseline access to supplier credit between credit report treatment and pure control shops, as well as between spillover and pure control shops, particularly on variables measuring regularly accessing supplier credit. This is due to skewed distribution of cluster-level averages and within-cluster differences of these variables. Because very few shops had regular access to supplier credit at baseline (8 percent in the full sample), this variable is distributed unevenly both across clusters and within clusters across treatment arms (credit report treatment and pure control). Hence, we are not able to remove the imbalance by removing outlier clusters or matching. In all estimations of intent-to-treat effects below we control for baseline values of variables related to financial access and supplier credit that have imbalance at baseline.[25]

In sum, at baseline, retail shops in our sample were small and mostly owner-operated. Even though most businesses were formal, most owners owned some valuable assets (land or vehicles) and the majority of owners said they know how to apply for loans, only a minority had borrowed from financial institutions. Access to supplier credit was even more limited, with a very small fraction having access to it regularly. A majority wished to borrow more and cited liquidity as a main challenge. Very few had a credit report or knew what it was. This suggests potential demand for credit reports that can show their creditworthiness to suppliers and the potential of business growth through accessing more supplier credit.

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[25]Specifically, we control for: years shop has been open, keeping some written records, saying they know how to apply for a bank loan, saying they wish to borrow more from a financial institution than they currently do, average length of relationship with suppliers, number of suppliers giving regular credit, saying they had a credit report at baseline, and having defaulted or delayed payment with suppliers.

2.8 Sample Characteristics: Suppliers

Around the same time of the retail shop baseline survey, we surveyed 13 suppliers (distributors or wholesalers). They include 7 of the 11 distributors and 6 of the 56 wholesalers. Table 6 to Table 8 present background characteristics of these suppliers from the baseline survey.

Suppliers had been in business for longer than retail shops in our sample. They were also larger in terms of number of workers and amount of revenue, and distributors were much larger than wholesalers. All had access to trade credit from their own suppliers, and most borrowed from banks. A small number of distributors and all of the wholesalers said they wished to borrow more (from any source) than they currently did.

In terms of trade credit they gave to their retail shop customers (which constitute the bulk of their customer base), a significant fraction were regular customers (80 percent for distributors, and 42.9 percent for wholesalers), but only a small fraction got credit (5 percent for distributors, and 17.4 percent for wholesalers) despite many more having asked for credit (39.5 percent for distributors, and 45.9 percent for wholesalers). All said that a customer needed to have been with them for some time before qualifying for credit. Retail shop owners that knew the supplier were much more likely to get credit than those who didn't, and so were those located in the same town as the supplier, showing the potential importance of personal relationships and ability to enforce repayment (even though some retail shops that don't know the supplier get credit from some wholesalers, and some wholesalers say personal relationships aren't required to get credit).

Suppliers relied mostly on personal inspection or relationships when deciding whether to give credit to a customer, and some got information from banks or competitors. When a customer defaults, they most commonly report to the police, court, and debt collectors. None used services from credit bureaus, though a minority had heard of it. The majority of distributors, and a minority of wholesalers, said they were able to give more trade credit if there were more qualifying customers. Most say they would be more willing to give

credit to customers with a good history with other supplier, though many (especially among wholesalers) were reluctant to give credit to a first-time customer. The majority said they would be interested in paying to get a credit report of a new customer, and were willing to pay on average 3 USD for one. Most said they would be willing to join a credit bureau and submit credit history with customers in exchange for access to credit history of (potential) customers, and all said they would be willing to submit a customer's credit history if requested by a customer who joins a credit bureau.

These summary statistics on suppliers show that at baseline suppliers had limited knowledge of credit bureau but were interested in their services, and some were able and willing to give credit to customers with a good credit history.

3   Results

3.1   Take-up of Credit Bureau Service

Out of the 227 shops assigned to the "credit report" treatment, 190 or 83.7 percent signed up for the credit bureau's SME credit reporting service with our full subsidy. Table 9 shows a linear regression of the decision to take up the credit report among those offered it on respondent and shop characteristics. There are only three predictors of take-up that are statistically significant: having taken a loan for business from a financial institution, mentioning credit bureau when being asked where suppliers report default, and having no employee are all positively correlated with take-up. The first two suggests that shop owners with more experience with credit or knowledge on credit information sharing were more likely to take up, while the last may suggest that smaller shops that were trying to grow were more likely to take up. Overall, we are not able to predict take-up well, as the adjusted R-squared is about 0.04.

For wholesalers we also offered the opportunity to receive the credit bureaus' SME credit report for free (with full subsidy from us). 22 of the 56 wholesalers signed up.

For distributors, we invited them to sign up to the CIS service for free (with full subsidy from us). Since there are strategic complementaries of suppliers' participation – the benefit to one supplier from signing up is increasing in the number of others signing up – we tried to sign them up at once and create common knowledge of others' actions. We organized a meeting for the 11 distributors, which 7 attended. At the end of the meeting, 4 suppliers expressed interest in signing up to the service. Though in the end only 2 completed the process of signing up, and only one of them used the service at all (the other one signed up but never really installed the necessary system to use the service).

3.2 Credit Report Quality

The credit bureau was supposed to create 212 credit reports for small business in our study, 190 for retail shops that signed up, and 22 for wholesalers that signed up. In the end, they managed to create 202 credit reports.

The credit bureau sent staff to collect information to be used for the credit reports from retail shops from September to November 2015. In December 2015 we started receiving credit reports and delivering them to respondents. During delivery we explained again how the credit report works and how they could use it, and let respondents go over their report to check for any mistakes. 91 out of the 202 respondents said their report had either incorrect or missing information in them, with a total of 146 cases of incorrect or missing information. The majority of these cases are about information on the business (e.g. their suppliers, customers, bank loans, trade credit, sales, assets, or history; other categories including information on the respondent, e.g. name and ID number, and credit report missing certain sections). While it is possible that respondents would claim something is a mistake in order to inflate certain answers to get a better rating, some of the cases are simply inaccurate information that does not bias the rating in a certain direction, while many cases are missing information [26]. Furthermore, given that the credit bureau can verify

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[26]We have already ruled out cases where the alleged mistakes are simply disagreements over the credit

the information, respondents have little incentive to lie especially on bank loans which the credit bureau has in their database. Therefore, even though the actual number of mistakes may deviate from the reported one, we believe the high number of reported mistakes does reflect the degree of error contained in the credit reports. We reported the mistakes back to the credit bureau and let them reconcile with respondents and correct mistakes, and then delivered updated reports to respondents.

In addition, the credit bureau was supposed to collect information on trade credit by asking shop owners where they get credit and the terms, and then verifying with these suppliers. However, in the end the credit bureau later told us they did not do this step and hence we did it ourselves to ensure the truthfulness and completeness of the information in the reports. Both this omission, and the mistakes mentioned above, could be due to the service being new to the credit bureau, its capacity constraint in generating a large number of such reports, or general low quality of the service of this credit bureau.

Due to the process of correcting mistakes and verifying trade credit information, as well as general delays from the credit bureau, we finished delivering credit reports in July 2016, eight months after the credit bureau finished collecting information from shops in November 2016, and eight months before the endline survey started in March 2017. Since the credit reports were valid for one year starting from when the information is collected, some shop owners complained that they did not feel they had enough time to use these reports to get supplier credit, which may have decreased the magnitude of retail shop responses compared to a case where the reports were delivered more swiftly and had fewer mistakes (see Section 3.5).

3.3   Attrition

During the endline survey of retail shops between March and May 2017, we first called respondents to make appointments. We were able to reach 619 of the initial 659 baseline

rating.

respondents. 525 of these respondents were still doing retail of consumable products (henceforth "doing retail", 84.8 percent of the 619 we found), while 94 were no longer doing retail. Due to budget constraint we decided to only conduct in-person surveys with respondents who were still doing retail and had either not moved (475 respondents) or moved to somewhere within the study area (24 respondents), so we surveyed 499 respondents in person. We conducted phone survey with the remaining 94 respondents who were no longer doing retail, and 26 respondents who were still doing retail but had moved out of the study area. Among the 499 respondents we attempted to survey in person, we managed to reach 483, all of whom agreed to take the survey. Among the 120 respondents we attempted to survey on phone, 116 consented to the survey. So overall our endline sample of retail shops is composed of 483 respondents surveyed in person, all of whom were still doing retail, and 116 respondents surveyed on phone (26 of whom were still doing retail, and 90 no longer doing retail). 60 out of the initial 659 baseline respondents, or 9.1 percent, attrited. (Though since the in-person survey was more extensive than the phone survey, for questions that are only in the former, 176 out of 659, or 26.7 percent, of baseline respondents attrited in this sense.)

Table 10 shows different types of attrition by treatment status, with the same regression specifications as in Table 1. We see that overall attrition is balanced across treatment arms. Though credit report treatment, spillover and information-only treatment shops are less likely to be found than pure control shops due to being unavailable for in-person survey (conditional on being found on phone appointments).

To understand what types of shops were likely to remain in the endline sample, we run a linear regression of an indicator for attrition on respondent and shop characteristics (Table 11), where attrition is defined as any baseline respondent for whom we do not have endline data (i.e. those who were unreachable, declined the survey or were no longer doing retail; those no longer doing retail may be doing another type of business or no longer doing business). In both the overall sample and among shops that received the credit report treatment, having taken a loan for business from a financial institution at baseline is associated

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with lower rates of attrition, meaning shops with more access to bank loans at baseline were more likely to remain in the sample at endline (the same relationship holds among the two types of control shops – pure control, and all shops that did not receive the credit report treatment – but the coefficients are statistically insignificant). These shops (with access to bank loans at baseline) may be the ones more likely to benefit from the credit report treatment as they had richer credit history at baseline, or less likely to benefit as they already had more access to bank credit and hence may be less in need of trade credit.

Having defaulted or delayed payment with a supplier at baseline is associated with higher rates of attrition, meaning shops with (self-reported) history of default at baseline are less likely to remain in the sample at endline (this relationship holds for the full sample, as well as for credit report treatment shops and all other shops, though the latter two have statistically insignificant coefficients; the coefficient goes in the opposite direction for pure control shops). Shops with history of default or delay on trade credit at baseline are presumably less likely to benefit from the credit report treatment as they have at baseline credit history that they do not wish to reveal / would hurt them if revealed, and hence they cannot leverage this trade credit history to gain the trust of more suppliers. Note that however these shops were not less likely to take up the credit report offer as seen in Table 9.

In sum, we do not have strong indication of whether shops that drop out of the sample before endline are more or less likely to benefit from the credit report treatment, though there is weak evidence that they may be the ones less likely to benefit, in which case our ITT estimate would be an upper bound of how much a representative retail shop would benefit from being offered a credit report.

3.4   Impact on Credit Report Usage and Knowledge

Table 12, Panel A presents results on the impact of the treatments on credit report usage and knowledge. It has the same regression specifications as in Table 1, except we control for baseline outcomes whenever possible to increase precision of estimates, and also control

for important baseline variables related to financial access and supplier credit that have imbalance at baseline. The sample is the 599 retail shops with whom we conducted in person or phone survey at endline.

The credit report treatment had a large and statistically significant effect on ownership of credit report: comparing credit report treatment shops and pure control shops, the treatment increased ownership by 38.8 percentage points, relative to a mean of 2.4 percent among pure control shops. However, only 89 credit report treatment shop owners reported having a credit report, much lower than the 190 who signed up to get a credit report during intervention. This suggests that some people may have forgotten that they had one or lost theirs.[27] The credit report treatment also had a large effect on knowledge of credit report: we asked respondents what a credit report was, and only counted the response as correct if they said it was a document with one's name, ID, and history of borrowing (esp. from banks and other financial institutions) that can be used to show one's creditworthiness. Among pure control shops, 7 percent were able to explain it correctly. The credit report treatment increases this proportion by 18.5 percentage points. Though this is lower than what one would expect given that 38.8 percent more respondents reported owning a credit report. Also, the credit report treatment does not significantly increase some other measures of knowledge: credit report treatment shops were only slightly more likely to mention credit bureau when asked an open ended question about where suppliers would report default; they were more likely to say yes when asked whether they thought other supplies will know if they default or delay payment with one supplier, but the difference is not statistically significant. This is potentially due to this information on supplier information sharing being more removed from the credit report itself and hence remembered by fewer people, or respondents were aware of the fact that actually few suppliers signed up for the CIS service despite its availability. The information-only treatment had almost no effect on any of the above outcomes on credit report ownership and knowledge, indicating that shop owners in this treatment either did not understand or

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[27]Since we survey the same respondents for baseline and endline, this is not caused by shops with multiple owners where the owner who got the credit report did not tell the other owner.

did not remember the message we gave them. Given the persistence of knowledge among treated shops, the latter seems more likely, that information only treatment shop owners understood but forgot the message as it became less salient without the credit report.

Panel B presents non-causal descriptive statistics based on whether the respondent had a credit report at endline, and, among those who had one at endline, whether they were part of the credit report treatment. Most respondents with a credit report thought it was accurate, and there is little difference based on whether they were part of the credit report treatment (i.e. likely to have gotten it through our intervention). Those with a credit report were much more likely to be able to explain correctly what it was, and there is little difference by treatment status, though only about 60 percent of those owning a credit report can explain it correctly. Very few people in any group mentioned credit bureau when asked where suppliers report default in an open ended question, though those with a credit report were more likely to do so. Those with a credit report were much more likely to say other suppliers would know if they defaulted or delayed payment with a supplier, and this fraction is also higher among those who got a credit report as part of the credit report treatment, possibly due to our messaging during the intervention. Note that the last three outcomes are also presented in Panel A with their intent-to-treat effects, and only the first one shows a significant treatment effect.

The majority of respondents who had a credit report at endline did nothing with it or planned to do nothing. The lack of response among treated respondents may be explained by the fact that due to delays in delivering the reports, some shop owners did not feel they had enough time to use these reports before they expired. However, surprisingly, even among respondents who got a credit report and were not part of the credit report treatment (and hence presumably paid for their own credit report), the majority did nothing or planned to do nothing with it. Some had asked their supplier for credit using the credit report or planned to do so, and this fraction is much higher for those in the credit report treatment, possibly due to our messaging which emphasized using credit report to apply for supplier

credit. In contrast, among those who got a credit report but were not in the credit report treatment, most people who did anything or planned to do anything with the report said they asked for bank loan or planned to do so.

3.5 Impact on Trade Credit and Business Outcomes

Table 13 and Table 14 present results on the impact of the treatments on trade credit outcomes and other business outcomes. It has the same regression specifications as in Table 12, including controlling for baseline outcomes and important baseline variables related to financial access and supplier credit that have imbalance at baseline. The sample is the 599 retail shops with whom we conducted in person or phone survey at endline for some outcome variables, and the 483 retail shops with whom we conducted in-person survey for other outcome variables (i.e. only those that could be found at baseline, had stayed within the study area, and consented to an in-person survey), as can be seen from the sample sizes.

Credit report treatment shops were more likely to have asked any supplier for credit, with a 10.5 percentage point increase over the mean of 31.8 percent for pure control shops.[28] They were also much more likely to have volunteered to share credit report with the supplier when asking for credit; in fact, the only shop owners that did this were from the credit report treatment. Although out of the 50 credit report treatment shops who said they had a credit report at endline and asked supplier for credit, only 15 volunteered to share it when applying for supplier credit.

However, despite the increased rate of applying for supplier credit, the credit report treatment did not have much impact on trade credit outcomes. Out of the eight outcome variables measuring trade credit access at endline, only three are statistically significant at the 10 percent level for the credit report treatment effect (i.e. comparison of credit report treatment shops and pure control shops; with one significant at the 5 percent level). The Anderson index of these variables is positive and statistically insignificant, implying that

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[28]This coefficient is borderline significant at the 5 percent level.

the overall effect of being offered a credit report on trade credit access is too small to be detected. Nor does it have a significant impact on the likelihood that the shop has defaulted or delayed payment with a supplier.[29]

Consistent with the lack of impact on access to trade credit, the treatments also have little impact on other business outcomes including monthly value of purchases from main suppliers of consumables, sales and profit, show in Table 14, Panel B.[30] From Panel C, it can be seen that there was also no impact on bank loan outcomes, and the fraction of respondents applying for a bank loan in the past two years remains low without much difference between treatment arms, possibly due to our messaging which emphasized using credit report to apply for supplier credit.

The information-only treatment had no significant effect on any trade credit or business outcome, including default or delays in payment with suppliers, which is not surprising given its lack of impact on knowledge of credit information sharing.

Next we look at the spillover effect, i.e. the comparison between spillover shops (untreated shops in clusters where some shops received the credit report treatment) and pure control shops. They were as likely to have asked suppliers for credit as credit report treatment shops: 10.4 percentage points higher than pure control shops. They were no more likely to volunteer to share their credit report with the supplier when asking for credit, as expected, since they were no more likely than pure control shops to own a credit report. As we see from Table 12, spillover shops did not exhibit increased knowledge of credit reports or credit bureaus, and hence they may be more likely to ask suppliers for credit after seeing neighboring treated shops doing so, though we do not have evidence for this mechanism. They also showed increases in a number of variables measuring trade credit access, including

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[29]Since this information comes from self-report, it could be due to social desirability bias. We think it is unlikely to affect our results since even though credit report treatment shops (as well as information-only treatment shops) were given this information, they did not remember it at endline, and also we see no impact of the treatment.

[30]As before, since only a fraction of respondents were able to come up with a response for sales and profit (though the fractions are higher than at baseline). As a result, we use monthly value of purchases from main suppliers of consumables as a proxy for business scale or turnover, and this variable is positively correlated with sales (correlation being 0.66 at baseline and 0.48 at endline).

the Anderson index which is statistically significant at the 10 percent level, even though this does not translate into an impact in any downstream business outcomes. Thus, it looks like both credit report treatment shops and spillover shops are more inclined to ask suppliers for credit, though spillover shops are rewarded more than credit report treatment shops.

We think the following may explain this result: after some credit reports were distributed, one shop owner who received a credit report asked one of the major suppliers for credit, was granted credit, and then defaulted on the credit. The supplier was hoping the credit bureau could recover the credit but was not able to. Subsequently the supplier told us they would refuse to give credit to anyone asking them for credit with a credit report.

There are 21 shops whose owners asked this particular supplier for credit between baseline and endline, which constitute 4.35 percent of the 483 shops surveyed in person at endline, distributed evenly between credit report and spillover shops, though both types of shops were more likely to have asked this supplier for credit than pure control and information only treatment shops.[31] Among these shops, spillover shops had more success than treated shops in getting credit from this supplier: among the 7 spillover shops that asked them for credit, 3 got credit; among the 9 treated shop that asked, 2 got credit; if we restrict to the 6 out of 9 that claimed they had a credit report at endline, only 1 got credit.

Treatment effects on trade credit access after removing these 21 shops are presented in Table 15. We see that results are more similar between the credit report treatment shops and spillover shops, and the credit report treatment effects generally increase, though both effects are statistically insignificant when looking at the Anderson index. These are not strictly intent-to-treat effects, as the treatment affects tendency to ask this particular supplier for credit, and such shops are removed from this analysis, but it shows that some of the (lack of) credit report treatment effect, and the greater access to trade credit among spillover shops compared to treatment shops, are explained by this one supplier who lost faith in the credit reports.

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[31]Out of the 21, there are 9 among credit report treatment shops, 7 among spillover shops, 2 among pure control shops, and 3 among information only treatment shops.

In Table 16 we present results of instrumental variable regressions estimating the causal effect of owning a credit report, with being assigned to the credit report treatment as instrument for credit report ownership. We present both a sample composed of only credit report treatment shops and pure control shops (columns 1 and 3), and the full sample (columns 2 and 4). We use two measures of credit report ownership: self-reported ownership at endline, and a variable that is identical for non credit report treatment shops and adjusted by take-up for credit report treatment shops (i.e. if a shop owner self reported as not having a credit report at endline but took up the intervention, we count them as owning a credit report in this measure). The coefficients for the two comparisons between credit report treatment shops and pure control shops are larger in magnitude than the corresponding ITT effects for the same comparison, and more outcomes are statistically significant at the 10 percent level. The Anderson index for trade credit access is still statistically insignificant, even though its size is nontrivial (0.358) in the version using self-reported credit report ownership.

Overall, shops offered credit reports were more likely to ask suppliers for credit and to volunteer to share their credit reports, but the impact on trade credit access is negligible. Spillover shops which were untreated shops near treated ones were also more likely to ask suppliers for credit, possibly following nearby treated shops, and were slightly more successful in accessing supplier credit, possibly due to some suppliers losing trust in credit reports after a default incident. This seems to imply that one of the effects of being offered a credit report (or being near a shop that was offered one) is being encouraged to ask suppliers for credit, and one is slightly more successful in accessing supplier credit simply by asking, though the benefit of a credit report is minimal in our context.

3.6   Heterogeneous Treatment Effect

We think shops most likely to benefit from a credit report are those who are "creditworthy" but undervalued by some suppliers. We think shops that most likely fall in this type are ones who got credit from some but not all suppliers at baseline, which are 107 out of 659

shops in the full sample. Thus we look at the heterogeneity of the credit report treatment effect based on this variable.[32]

Table 17 presents regression results of a few endline outcome variables measuring access to supplier credit on the credit report treatment indicator and its interaction with an indicator for whether the shop got credit from some but not all suppliers at baseline. The sample is the 599 retail shops with whom we conducted in person or phone survey at endline for some outcome variables, and the 483 retail shops with whom we conducted in-person survey for other outcome variables (i.e. only those that could be found at baseline, had stayed within the study area, and consented to an in-person survey), as can be seen from the sample sizes. When we compare credit report treatment shops to pure control shops only (columns 1 and 2), the interaction terms are not statistically significant. When we compare credit report treatment shops to all other shops (columns 3 and 4), we see that shops that got credit from some but not all suppliers at baseline were more likely to ask suppliers for credit once they were offered a credit report, but no more likely to access it.

This implies that shops which presumably had more positive signals to reveal to suppliers did not manage to benefit from such signals. This could be due to suppliers not trusting the signal, suppliers not finding the signal informative, or suppliers being unable to offer more trade credit. We turn to the next section to try to distinguish between different mechanisms.

3.7 Supplier Outcomes

To understand why the credit report treatment did not lead shops to access more supplier credit despite causing them to ask for it more, we look at outcomes on suppliers at endline.

Table 18 presents results from the supplier endline survey which took place a few months after the retail shop endline survey. We found 52 suppliers in total: 6 out of the 11 distrib-

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[32]There are two reasons why we use measures of baseline trade credit access rather than credit score for heterogeneity analysis: we do not have credit scores for shops who did not get a credit report (either because they were not assigned this treatment or they did not take up), and we do not think the scores are informative since the credit bureau was new to creating credit scores for these SMEs – we see the main value of the credit reports as presenting verified information on the shops rather than the credit scores themselves.

utors at baseline, and 46 out of the 56 distributors at endline. Though there is little overlap with the baseline supplier sample: 3 distributors and 5 wholesalers surveyed at endline were also surveyed at baseline (the baseline sample includes 7 distributors and 6 wholesalers). We present both overall results and results separately for distributors and wholesalers.

All distributors surveyed were able to explain the concept of a credit report correctly. Among wholesalers, 21.7 percent were able to explain it correctly, and another 19.6 percent only mentioned blacklisting of defaulters rather than recording the entire credit history. Most distributors (83.3 percent), and a small fraction of wholesalers (19.6 percent), had seen a credit report. All respondents thought it had accurate information.[33] Given this, and the lack of success in getting supplier credit by retail shop owners who got a credit report, it is likely that despite trusting the truthfulness of the information in the credit reports, suppliers do not think this information alone is sufficient in deciding to give credit to customers.[34] Another possible explanation is suppliers' lack of ability to give more credit to qualifying customers, which could be more of a constraint for wholesalers (16.7 percent of whom said they would be able to give more credit to qualifying customers at baseline) than for distributors (71.4 percent said so at baseline). These together constitute constraints that may still be binding even if suppliers were provided with information on retail shops' credit history that they trusted.

In terms of utilization of credit bureau services, the majority of distributors (66.7 percent) and a small fraction of wholesalers (8.7 percent) said they had a credit report, and most of those who had one said they would be willing to pay to renew it, even though those without a credit report did not show much interest in paying to get one. Most distributors (83.3 percent) and a smaller fraction of wholesalers (30.4 percent) had heard of the credit bureau's information sharing service for suppliers, though only one distributor and one wholesaler

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[33]This result could be due to courtesy bias as some of them knew we worked a credit bureau for the study, though given 100 percent of suppliers said they thought the reports were accurate the true level is likely still high.

[34]We also asked suppliers at endline about their willingness to give credit to a first time customer with a good credit history. However, since few suppliers surveyed at baseline were found at endline, we do not find it meaningful to compare this with responses from the same question at baseline.

said they had joined (and since we were only aware of the distributor joining, the wholesaler response is likely a mistake).

4   Conclusion

We study the effect of introducing formal information sharing via credit bureaus to retail shops and their suppliers in Western Kenya, a context where buyers (retail shops) had limited access to supplier credit and suppliers' lack of information on buyers may be preventing more credit provision. We find that offering free credit reports to retail shop owners causes them to adopt credit reports and have better knowledge on credit reports, though increase in knowledge is lower than expected. It also increases shops' likelihood of asking suppliers for credit. However, the effect on access to supplier credit is negligible, even though at baseline retail shop owners expressed the desire to access more credit, and suppliers expressed interest in better understanding buyers' credit history. As suppliers express trust in the accuracy of the credit reports, a likely explanation is suppliers may not think the information in the reports is enough to decide whether to give credit to a customer (e.g. a customer who performs well in repaying their other lenders will not necessarily repay them well). Another potential barrier that applies particularly to smaller suppliers is that they are liquidity constrained themselves and not able to offer more credit to customers.

Shops near those offered credit reports but were not offered reports themselves were also more likely to ask suppliers for credit, and were slightly more successful than those offered credit reports in obtaining credit. Since these shops did not increase in terms of ownership or knowledge on credit reports, a likely mechanism is they simply followed nearby shop owners who got a credit report in asking suppliers for credit, though we lack evidence for this mechanism. We think the fact that they were slightly more successful in obtaining supplier credit than shops offered credit reports is due to one of the major suppliers losing trust in credit reports after experiencing a default from a shop owner who got credit with a

report, and subsequently penalizing shops asking for credit with a report.

We also find that simply giving information to retail shop owners without offering free credit reports does not increase credit report ownership, knowledge, or access to trade credit. On the supplier side, we find that it is challenging to get suppliers to adopt formal information sharing services of the credit bureau even when it is offered for free, which could be due to lack of interest, the service being not yet useful due to the lack of other suppliers' participation, or cost in adopting a new technology. Furthermore, the quality of credit bureau service in our context is low, and needs to be improved to establish long term trust among retail shops and suppliers.

Even though at baseline suppliers had limited information on customers' credit history, it's not clear whether providing them with such information (even if they trust it) will help them identify customers who will potentially repay well and extend (more) credit to them. This could be due to suppliers already having enough information on shops and not needing a formal system of credit information sharing. However, given that at baseline suppliers expressed interest in seeing the credit history of customers, and also that suppliers tend to give credit to shops that they know personally or are located in the same town as them, they seemed to be aware that they were missing out on giving credit to some customers who can repay well. Therefore, a more plausible explanation of the lack of response from suppliers is that they are too afraid that even customers who have a good credit history with other lenders will still default or delay payment with them, if such customers have not yet established enough trust with this supplier to be granted credit. This could be due to suppliers not understanding how to make credit decisions based on credit reports, finding it too risky compared to making credit decisions based on personal history and relationships, or believing they are in an environment where repayment with different lenders are not highly correlated and incentives matter much more than the customer's "type" (tendency to repay in general). While we cannot distinguish among the three explanations here, there are reasons to think the first two play at least some role, as the concept of credit report is still

very new to suppliers: none was using a credit bureau service at baseline; the case where a supplier gave credit to someone with a report and stopped trusting the reports completely after they defaulted also illustrates limited understanding in how credit reports work. Credit bureaus are relatively new in Kenya, with the legislation requiring banks and microfinance institutions to submit full file credit information to licensed credit bureau being passed in 2013 and effective starting 2014. Even though introducing formal information sharing, and hence lowering the cost of truthful information sharing, can improve the credit market in theory, its efficacy in practice depends on the context, particularly whether lenders will utilize the information to make credit decisions, their familiarity with the mechanism, and their own ability in giving out credit.

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Table 1: Retail Shop Baseline Summary Statistics

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel A. Respondent Background Characteristics						
Male	0.393	-0.006	-0.033	0.029	0.000	659
	(0.491)	(0.058)	(0.061)	(0.073)	(0.045)	
Age	34.292	2.906*	2.006	3.016*	0.611	654
	(9.289)	(1.518)	(1.557)	(1.609)	(0.962)	
Highest level of education:						
Some or completed Primary School	0.315	-0.006	0.008	-0.030	-0.033	659
	(0.467)	(0.071)	(0.065)	(0.066)	(0.042)	
Some or completed Secondary School	0.461	0.012	0.031	0.042	0.002	659
	(0.501)	(0.066)	(0.056)	(0.074)	(0.047)	
Some or completed College	0.180	-0.039	-0.050	-0.023	0.019	659
	(0.386)	(0.055)	(0.047)	(0.057)	(0.034)	
Some or completed University	0.022	0.020	0.015	0.024	0.007	659
	(0.149)	(0.018)	(0.015)	(0.027)	(0.018)	

Notes: This table presents baseline summary statistics and OLS estimates of differences between treatment arms. Outcome variables are listed on the left. 'Credit report treatment effect' refers to the difference between credit report treatment shops and pure control shops. 'Spillover effect' refers to the difference between spillover and pure control shops. 'Information treatment effect' refers to the difference between information only treatment shops and pure control shops. 'Pooled treatment effect' refers to the difference between credit report treatment shops and all other shops. Columns (2) and (3) include strata fixed effects, and columns (4) and (5) includes cluster fixed effects. All standard errors are clustered at the cluster level (except for column (4) where it is not clustered) and in parentheses. All monetary values are in USD. * denotes significance at 10%, ** 5%, and *** 1% levels.

Table 2: Retail Shop Baseline Summary Statistics (continued)

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel B. Business Characteristics						
Years shop open	4.461	2.001***	1.529***	1.645*	0.435	659
	(4.710)	(0.621)	(0.480)	(0.869)	(0.608)	
Number of owners	1.528	-0.046	0.045	-0.027	-0.082	659
	(0.524)	(0.079)	(0.073)	(0.079)	(0.050)	
Number of regular employees (paid and unpaid)	0.236	-0.067	-0.051	-0.030	0.001	659
	(0.453)	(0.049)	(0.049)	(0.077)	(0.040)	
Has no employee	0.775	0.068	0.065	0.074	-0.013	659
	(0.420)	(0.044)	(0.044)	(0.058)	(0.035)	
Keeps some written records	0.449	0.147**	0.036	0.058	0.073	659
	(0.500)	(0.068)	(0.068)	(0.073)	(0.045)	
Includes all items of income and expenditure in business record	0.303	0.036	-0.020	0.039	0.056	659
	(0.462)	(0.073)	(0.069)	(0.069)	(0.043)	
Calculates profits or losses periodically	0.236	0.037	-0.019	0.055	0.041	659
	(0.427)	(0.059)	(0.052)	(0.066)	(0.040)	
Business is insured	0.112	-0.068**	-0.068**	-0.086**	0.008	659
	(0.318)	(0.033)	(0.032)	(0.034)	(0.018)	
Formal business	0.921	0.037	0.046	0.056*	0.000	659
	(0.271)	(0.033)	(0.034)	(0.031)	(0.019)	
Registered at the National Companies Registry	0.011	0.021	0.017	0.013	0.009	659
	(0.106)	(0.015)	(0.015)	(0.022)	(0.018)	

Notes: See notes to the previous table.

Table 3: Retail Shop Baseline Summary Statistics (continued)

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel C. Inventory, Sales and Profit						
Inventory value in 7 major products	94.320	60.397	53.128	58.393	17.866	659
	(304.803)	(38.172)	(33.558)	(46.985)	(24.063)	
Sales last month	1844.081	-63.563	9.983	-248.695	87.908	236
	(3933.926)	(456.742)	(475.453)	(672.451)	(308.157)	
Not knowing sales at baseline	0.652	-0.074	0.023	0.004	-0.046	659
	(0.479)	(0.049)	(0.058)	(0.070)	(0.044)	
Total monthly purchase value of consumable products from main suppliers	1440.211	260.651	298.031	498.565	-45.080	659
	(2238.643)	(210.286)	(253.651)	(344.153)	(263.653)	
Reported profit last month	137.818	67.082	25.208	23.457	43.228	238
	(156.930)	(40.373)	(25.491)	(39.836)	(39.438)	
Not knowing profit at baseline	0.629	-0.046	0.027	0.001	-0.026	659
	(0.486)	(0.050)	(0.057)	(0.070)	(0.045)	
Calculated profit last month	384.364	-4.202	29.617	-198.478	-2.159	236
	(1329.260)	(196.955)	(189.068)	(299.257)	(198.454)	
Total business expense last month other than interest payment	754.712	73.400	124.868	121.290	-50.276	659
	(1688.780)	(125.785)	(126.034)	(252.960)	(127.473)	
Panel D. Asset Ownership						
Owns land	0.809	0.012	0.006	0.022	-0.006	648
	(0.395)	(0.028)	(0.041)	(0.059)	(0.037)	
Has title deed of land	0.670	0.012	-0.029	-0.020	0.022	646
	(0.473)	(0.034)	(0.039)	(0.073)	(0.044)	
Owns truck car or van	0.056	-0.017	0.006	-0.034	-0.019	659
	(0.232)	(0.028)	(0.027)	(0.027)	(0.022)	
Owns motorbike	0.213	-0.043	-0.055	-0.047	0.011	659
	(0.412)	(0.032)	(0.036)	(0.058)	(0.034)	

Notes: See notes to the previous table.

Table 4: Retail Shop Baseline Summary Statistics (continued)

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel E. Access to Financial Institutions						
Has bank or microfinance account	0.708	0.038	0.006	-0.049	0.016	656
	(0.457)	(0.050)	(0.044)	(0.069)	(0.040)	
Participates in a ROSCA	0.685	-0.043	-0.100	-0.089	0.077*	658
	(0.467)	(0.071)	(0.068)	(0.073)	(0.046)	
Has taken a loan for business from a financial institution	0.360	0.029	-0.024	-0.084	0.017	658
	(0.483)	(0.063)	(0.057)	(0.071)	(0.044)	
Knows how to apply for a loan for business from a financial institution	0.685	0.074	0.082*	-0.024	-0.014	659
	(0.467)	(0.050)	(0.048)	(0.071)	(0.040)	
Wishes to borrow more from a financial institution than they currently do	0.596	0.112**	0.101*	0.114	0.030	659
	(0.494)	(0.053)	(0.054)	(0.071)	(0.042)	
Lack of funds is one of the main challenges in running this business	0.730	-0.039	-0.068	0.125**	0.031	659
	(0.446)	(0.052)	(0.055)	(0.060)	(0.043)	
If had extra 10K Ksh would invest in this business	0.693	-0.008	-0.062	-0.028	0.053	654
	(0.464)	(0.051)	(0.056)	(0.070)	(0.044)	

Notes: See notes to the previous table. There is large variation in self-reported prices of main products. Therefore we calculate baseline inventory values using winsorized self-reported prices from main suppliers.

Table 5: Retail Shop Baseline Summary Statistics (continued)

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel F. Access to Supplier Credit						
Number of main suppliers of consumable products	1.809	-0.017	0.018	-0.009	-0.062	659
	(0.877)	(0.131)	(0.119)	(0.134)	(0.078)	
Average length of relationship with main suppilers in years	2.743	1.472***	1.038***	0.996*	0.422	650
	(2.498)	(0.368)	(0.315)	(0.510)	(0.425)	
Ever getting credit from a main suppliers of consumables	0.270	0.080	0.143	0.122**	-0.031	659
	(0.446)	(0.076)	(0.095)	(0.059)	(0.040)	
Number of main suppliers of consumables that give them credit	0.303	0.157	0.191*	0.139*	0.003	659
	(0.531)	(0.094)	(0.114)	(0.070)	(0.053)	
Percentage of main suppliers of consumables that give them credit	0.208	0.055	0.090	0.069	-0.007	659
	(0.379)	(0.077)	(0.085)	(0.046)	(0.032)	
Getting regular credit from a main suppliers of consumables	0.079	0.114***	0.072*	0.042	0.040	659
	(0.271)	(0.037)	(0.037)	(0.043)	(0.031)	
Number of main suppliers of consumables that give them credit regularly	0.101	0.126***	0.072*	0.044	0.054	659
	(0.371)	(0.047)	(0.041)	(0.056)	(0.037)	
Percentage of main suppliers of consumables that give them credit regularly	0.060	0.056**	0.050*	0.017	0.010	659
	(0.221)	(0.027)	(0.029)	(0.033)	(0.023)	
Value of purchase from main suppliers made on credit	320.000	53.170	40.161	204.274	54.273	659
	(1720.560)	(128.746)	(123.140)	(248.997)	(133.013)	
Percentage of purchase value from main suppliers made on credit	0.055	0.043	0.031	0.030	0.014	653
	(0.215)	(0.027)	(0.026)	(0.034)	(0.019)	
Has defaulted or delayed payment with supplier	0.158	0.028	-0.045	0.046	0.071**	586
	(0.367)	(0.062)	(0.049)	(0.062)	(0.035)	
Panel G. Credit Report Ownership and Knowledge						
Has credit report	0.056	-0.014	-0.030	-0.016	0.029*	659
	(0.232)	(0.026)	(0.020)	(0.030)	(0.016)	
Knows what a credit report is	0.090	0.080**	0.068*	0.052	0.032	659
	(0.288)	(0.033)	(0.036)	(0.049)	(0.034)	
Mentions credit bureau when asked where suppliers report default	0.000	0.028**	0.017*	0.000	0.005	659
	(0.000)	(0.012)	(0.010)	(.)	(0.014)	

Notes: See notes to the previous table.

Table 6: Supplier Baseline Summary Statistics

	(1) All suppliers	(2) Distributors	(3) Wholesalers
Panel A. Business Characteristics			
Years of business operation	14.923	20.286	8.667
	(9.802)	(10.323)	(3.933)
Number of owners	2.667	3.167	1.667
	(1.414)	(1.472)	(0.577)
Total number of workers	148.615	271.143	5.667
	(292.485)	(364.884)	(2.503)
Total number of branches	1.769	2.429	1.000
	(1.536)	(1.902)	(0.000)
Keeps written records	0.769	1.000	0.500
	(0.439)	(0.000)	(0.548)
Calculates profits or losses periodically	0.692	1.000	0.333
	(0.480)	(0.000)	(0.516)
Registered at the National Companies Registry	0.833	1.000	0.667
	(0.389)	(0.000)	(0.516)
Sales last month (1,000 USD)	723.278	1600.000	21.900
	(1040.102)	(1019.804)	(8.279)
Total monthly purchase value of consumable products from main suppliers (1,000 USD)	1622.269	2977.071	41.667
	(4307.688)	(5698.394)	(33.710)
Total business expenses last month (1,000 USD)	51.907	106.250	15.678
	(62.347)	(70.163)	(10.274)
Reported profit last month (1,000 USD)	290.300	1010.000	2.420
	(753.943)	(1400.071)	(4.239)
Calculated profit last month (1,000 USD)	666.283	1493.750	4.310
	(1008.134)	(1032.920)	(3.672)
N	13	7	6

Notes: This table presents baseline summary statistics on 13 suppliers: 7 out of the 11 distributors and 6 out of the 56 wholesalers. All monetary values are in USD. Standard deviations are in parentheses.

Table 7: Supplier Baseline Summary Statistics (continued)

	(1) All suppliers	(2) Distributors	(3) Wholesalers
Panel B. Access to Financial Institutions and Supplier Credit			
Borrows from financial institutions	0.900	1.000	0.833
	(0.316)	(0.000)	(0.408)
Wish to borrow more (from any source) than they are able to	0.600	0.250	0.833
	(0.516)	(0.500)	(0.408)
Gets credit regularly from any main supplier	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)
Fraction of purchases made on credit from main supplier of consumables	0.658	0.599	0.727
	(0.317)	(0.307)	(0.343)
Panel C. Trade Credit Given to Retail Shop Customers			
Number of customers that are retail shops	390.167	525.000	255.333
	(390.349)	(414.427)	(346.176)
Fraction of retail shop customers that are regular	0.631	0.733	0.509
	(0.297)	(0.216)	(0.358)
Fraction of retail customers that get credit	0.112	0.067	0.157
	(0.133)	(0.082)	(0.165)
Fraction of retail customers that asked for credit	0.427	0.418	0.436
	(0.420)	(0.456)	(0.424)
Fraction that customers must pay upfront when getting credit	14.615	14.286	15.000
	(22.955)	(24.398)	(23.452)
To get credit, needs to know supplier in person	0.692	0.857	0.500
	(0.480)	(0.378)	(0.548)
To get credit, needs to have been their customer for some time	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)
Fraction of retail shop customers that get credit among different types of customers:			
Among those the supplier knows	0.338	0.217	0.410
	(0.203)	(0.029)	(0.233)
Among those the supplier doesn't know	0.042	0.000	0.062
	(0.102)	(0.000)	(0.125)
Among those in the same town as the supplier	0.322	0.213	0.404
	(0.326)	(0.163)	(0.417)
Among those not in the same town as the supplier	0.101	0.091	0.115
	(0.085)	(0.028)	(0.163)

Notes: See notes to the previous table.

Table 8: Supplier Baseline Summary Statistics (continued)

	(1) All suppliers	(2) Distributors	(3) Wholesalers
Panel D. Credit Information Sharing			
Where they get information when deciding whether to give credit to new customers:			
From banks	0.231	0.286	0.167
	(0.439)	(0.488)	(0.408)
From competitors	0.308	0.286	0.333
	(0.480)	(0.488)	(0.516)
Own inspection / personal relationships	0.923	0.857	1.000
	(0.277)	(0.378)	(0.000)
From credit bureau	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
To whom they talk to about customer default:			
Debt collector	0.231	0.286	0.167
	(0.439)	(0.488)	(0.408)
Police	0.692	0.571	0.833
	(0.480)	(0.535)	(0.408)
Court	0.385	0.571	0.167
	(0.506)	(0.535)	(0.408)
Other businesses	0.077	0.000	0.167
	(0.277)	(0.000)	(0.408)
Bank / financial institutions	0.077	0.000	0.167
	(0.277)	(0.000)	(0.408)
Credit bureau	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Credit report usage and potential interest:			
Uses any credit bureau service	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Has heard of credit bureaus	0.231	0.286	0.167
	(0.439)	(0.488)	(0.408)
Able to give more trade credit if there were more qualifying customers	0.462	0.714	0.167
	(0.519)	(0.488)	(0.408)
More willing to give credit to customers with a good history with other supplier	0.923	0.857	1.000
	(0.277)	(0.378)	(0.000)
Possible to give credit to a first-time customer credit with good history	0.250	0.333	0.167
	(0.452)	(0.516)	(0.408)
Interested in paying to get a credit report of a new customer	0.692	0.571	0.833
	(0.480)	(0.535)	(0.408)
Willingness to pay for a credit report of a new customer (including zeroes)	2.885	0.929	5.167
	(3.754)	(1.835)	(4.262)
Would join credit bureau and submit credit history with customers	0.750	0.667	0.833
	(0.452)	(0.516)	(0.408)
Willing to submit customer's credit history if requested	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)

Notes: See notes to the previous table.

Table 9: Correlates of Take-up Among Those in Treatment Group: Regression Analysis

	(1) Take-up
Male	-0.080
	(0.058)
Age	-0.002
	(0.003)
Has more than primary education	0.010
	(0.054)
Owns land	0.102
	(0.081)
Has taken a loan for business from a financial institution	0.119 **
	(0.057)
Knows how to apply for a loan for business from a financial institution	0.018
	(0.070)
Wishes to borrow more from a financial institution than they currently do	0.002
	(0.058)
Lack of funds is one of the main challenges in running this business	0.035
	(0.059)
If had extra 10K Ksh would invest in this business	-0.006
	(0.055)
Years shop open	0.001
	(0.005)
Number of owners	-0.039
	(0.050)
Has no employee	0.137 *
	(0.077)
Keeps some written records	0.083
	(0.056)
Total monthly purchase value of consumable products from main suppliers	0.000
	(0.000)
Ever getting credit from a main suppliers of consumables	0.002
	(0.074)
Getting regular credit from a main suppliers of consumables	-0.034
	(0.126)
Value of purchase from main suppliers made on credit	0.000
	(0.000)
Percentage of purchase value from main suppliers made on credit	0.230
	(0.161)
Has defaulted or delayed payment with supplier	0.011
	(0.069)
Has credit report	0.074
	(0.091)
Knows what a credit report is	0.007
	(0.074)
Mentions credit bureau when asked where suppliers report default	0.165 *
	(0.091)
Adjusted R-Squared	0.037
Observations	227
Mean of Dependent Variable	0.837

Notes: OLS regression of the decision to sign up on variables presented in the table. Some variables have missing data; to avoid dropping these observations, we set these values to zero, create dummies for having missing data and include these in the regressions (coefficients not reported). Robust standard errors in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% respectively.

Table 10: Attrition

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Attrited due to any reason (unreachable, refused, or no longer doing retail)	0.202	0.066	0.070	0.045	0.018	659
	(0.404)	(0.050)	(0.059)	(0.061)	(0.039)	
Unreachable in endline phone appointment	0.045	0.038	0.018	0.024	0.022	659
	(0.208)	(0.029)	(0.024)	(0.035)	(0.022)	
Unreachable for in person survey	0.000	0.013	0.037**	0.053**	-0.010	499
	(0.000)	(0.012)	(0.016)	(0.026)	(0.020)	
Refused to give consent for in person survey	0.000	0.000	0.000	0.000	0.000	483
	(0.000)	(.)	(.)	(.)	(.)	
Refused to give consent for phone survey	0.000	0.044	0.044	0.105	0.053	120
	(0.000)	(0.050)	(0.043)	(0.079)	(0.054)	
Refused to give consent for in person or phone survey	0.000	0.008	0.012	0.021*	-0.004	603
	(0.000)	(0.008)	(0.013)	(0.011)	(0.008)	
No longer doing retail of consumables	0.165	0.024	0.030	-0.023	0.003	619
	(0.373)	(0.044)	(0.052)	(0.052)	(0.037)	

Notes: We define attrition as baseline respondents for whom we do not have endline data, i.e. those who were unreachable, declined the survey or were no longer doing retail. 'Credit report treatment effect' refers to the difference between credit report treatment shops and pure control shops. 'Spillover effect' refers to the difference between spillover and pure control shops. 'Information treatment effect' refers to the difference between information only treatment shops and pure control shops. 'Pooled treatment effect' refers to the difference between credit report treatment shops and all other shops. Columns (2) and (3) include strata fixed effects, and columns (4) and (5) includes cluster fixed effects. All standard errors are clustered at the cluster level (except for column (4) where it is not clustered) and in parentheses. * denotes significance at 10%, ** 5%, and *** 1% levels.

Table 11: Correlates of Attrition: Regression Analysis

	(1) Attrition among full sample	(2) Attrition among credit report treatment shops	(3) Attrition among pure control shops	(4) Attrition among non-credit-report-treatment shops
Male	-0.010	0.062	-0.170	-0.039
	(0.036)	(0.068)	(0.104)	(0.044)
Age	-0.001	-0.004	-0.009 *	-0.001
	(0.002)	(0.003)	(0.005)	(0.002)
Has more than primary education	0.005	-0.079	0.114	0.041
	(0.038)	(0.069)	(0.111)	(0.046)
Owns land	0.072	0.013	0.069	0.082
	(0.044)	(0.082)	(0.126)	(0.055)
Has taken a loan for business from a financial institution	-0.071 *	-0.163 **	-0.183	-0.040
	(0.039)	(0.071)	(0.131)	(0.050)
Knows how to apply for a loan for business from a financial institution	0.023	0.061	0.132	0.026
	(0.043)	(0.084)	(0.127)	(0.053)
Wishes to borrow more from a financial institution than they currently do	-0.025	-0.039	0.005	-0.032
	(0.037)	(0.071)	(0.104)	(0.045)
Lack of funds is one of the main challenges in running this business	0.036	-0.020	0.044	0.080 *
	(0.038)	(0.066)	(0.112)	(0.048)
If had extra 10K Ksh would invest in this business	-0.047	0.011	-0.035	-0.068
	(0.035)	(0.067)	(0.101)	(0.044)
Years shop open	-0.003	-0.000	-0.005	-0.004
	(0.003)	(0.006)	(0.011)	(0.004)
Number of owners	-0.033	-0.049	0.063	-0.036
	(0.033)	(0.062)	(0.104)	(0.040)
Has no employee	0.044	-0.000	0.058	0.057
	(0.047)	(0.084)	(0.127)	(0.058)
Keeps some written records	0.018	0.050	-0.156	0.005
	(0.035)	(0.062)	(0.104)	(0.043)
Total monthly purchase value of consumable products from main suppliers	-0.000	-0.000 **	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Ever getting credit from a main suppliers of consumables	0.061	0.137	-0.150	0.054
	(0.043)	(0.085)	(0.128)	(0.051)
Getting regular credit from a main suppliers of consumables	0.017	0.089	-0.098	0.009
	(0.103)	(0.170)	(0.403)	(0.145)
Value of purchase from main suppliers made on credit	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Percentage of purchase value from main suppliers made on credit	-0.145	-0.357	0.539	-0.115
	(0.161)	(0.275)	(0.561)	(0.215)
Has defaulted or delayed payment with supplier	0.082 *	0.099	-0.102	0.076
	(0.049)	(0.083)	(0.165)	(0.064)
Has credit report	-0.024	-0.165	-0.127	0.044
	(0.093)	(0.148)	(0.211)	(0.125)
Knows what a credit report is	-0.023	-0.016	0.071	-0.023
	(0.049)	(0.087)	(0.175)	(0.063)
Mentions credit bureau when asked where suppliers report default	-0.089	0.005	0.000	-0.020
	(0.137)	(0.216)	(.)	(0.194)
Adjusted R-Squared	-0.003	0.005	-0.022	-0.015
Observations	659	227	89	432
Mean of Dependent Variable	0.228	0.247	0.202	0.218

Notes: OLS regression of a dummy variable indicating attrition on variables presented in the table, where attrition is defined as any baseline respondent for whom we do not have endline data (i.e. those who were unreachable, declined the survey or were no longer doing retail). Columns (1), (2), (3) and (4) present results for the full sample, credit report treatment shops, pure control shops, and all shops other than credit report treatment shops, respectively. Some variables have missing data; to avoid dropping these observations, we set these values to zero, create dummies for having missing data and include these in the regressions (coefficients not reported). Standard errors in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% respectively.

Table 12: Credit Report Usage and Knowledge

Panel A. Treatment Effects on Credit Report Ownership and Knowledge

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Has credit report	0.024	0.406***	0.028	0.037	0.394***	588
	(0.153)	(0.045)	(0.024)	(0.033)	(0.039)	
Can correctly explain what a credit report is	0.071	0.192***	-0.027	0.018	0.235***	599
	(0.258)	(0.050)	(0.027)	(0.047)	(0.036)	
Mentions credit bureau when asked where suppliers report default	0.000	0.020*	0.013	0.000	0.010	599
	(0.000)	(0.012)	(0.009)	(.)	(0.015)	
Thinks other suppliers know if they defaulted/delayed payment with a supplier	0.247	0.058	-0.019	-0.045	0.088**	599
	(0.434)	(0.064)	(0.055)	(0.065)	(0.045)	

Panel B. Descriptive Statistics

	Has credit report	No credit report	Has credit report and in credit report treatment	Has credit report and not in credit report treatment
Whether respondent thinks credit report is accurate	0.990		0.988	1.000
Can correctly explain what a credit report is	0.604	0.050	0.607	0.588
Mentions credit bureau when asked where suppliers report default	0.047	0.006	0.056	0.000
Thinks other suppliers know if they defaulted/delayed payment with a supplier	0.443	0.212	0.472	0.294
What they have done with the credit report:				
Nothing	0.575		0.584	0.529
Asking supplier for credit	0.283		0.326	0.059
Asking bank for loan	0.142		0.090	0.412
What they plan to do with the credit report:				
Nothing	0.557		0.517	0.765
Asking supplier for credit	0.198		0.236	0.000
Asking bank for loan	0.151		0.135	0.235
N	106	482	89	17

*Notes: Panel A presents OLS estimates of treatment effects (intent-to-treat). The sample is the 599 retail shops with whom we conducted in-person or phone survey at endline. Outcome variables are listed on the left. 'Credit report treatment effect' refers to the difference between credit report treatment shops and pure control shops. 'Spillover effect' refers to the difference between spillover and pure control shops. 'Information treatment effect' refers to the difference between information only treatment shops and pure control shops. 'Pooled treatment effect' refers to the difference between credit report treatment shops and all other shops. Columns (2) and (3) include strata fixed effects, and columns (4) and (5) includes cluster fixed effects. All standard errors are clustered at the cluster level (except for column (4) where it is not clustered) and in parentheses. We also control for important baseline variables related to financial access and supplier credit that have imbalance at baseline: years shop has been open, keeping some written records, saying they wish to borrow more from a financial institution than they currently do, number of suppliers giving regular credit, saying they had a credit report was at baseline, and having defaulted or delayed payment with suppliers. The question asking respondents to explain what a credit report was was asked before asking whether they had a credit report. The respondent was considered to have explained it correctly if they say a credit report is a document with someone's name, ID, and history of borrowing (esp. from banks and other financial institutions). The question on where suppliers report default was asked as an open ended question. * denotes significance at 10%, ** 5%, and *** 1% levels. Panel B presents descriptive statistics for respondents with and without a credit report at endline, and respondents with a credit report at endline who were in the credit report treatment or not.*

Table 13: Trade Credit and Business Outcomes

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel A. Treatment Effects on Trade Credit Outcomes						
Asked any supplier for credit	0.318	0.105*	0.104**	-0.006	0.006	599
	(0.468)	(0.053)	(0.048)	(0.075)	(0.046)	
Volunteered to share credit report with any supplier	0.000	0.071***	0.000	0.000	0.074***	599
	(0.000)	(0.025)	(.)	(.)	(0.019)	
Ever got credit from any main supplier of consumables	0.359	0.077	0.053	0.024	0.003	483
	(0.484)	(0.060)	(0.054)	(0.083)	(0.049)	
Gets credit regularly from any main supplier of consumables	0.156	0.062	0.064	0.032	-0.003	483
	(0.366)	(0.038)	(0.041)	(0.066)	(0.043)	
Fraction of purchases made on credit from main supplier of consumables	0.194	0.035	0.047*	0.052	0.001	483
	(0.339)	(0.042)	(0.026)	(0.055)	(0.031)	
Monthly value of purchases made on credit from main supplier of consumables	324.487	113.295	135.594*	382.702*	-63.939	483
	(980.876)	(91.154)	(71.943)	(225.937)	(102.966)	
Number of main supplier of consumables ever given credit	0.359	0.096	0.082	0.050	0.007	483
	(0.484)	(0.063)	(0.058)	(0.090)	(0.056)	
Number of main supplier of consumables giving credit regularly	0.156	0.069*	0.087**	0.033	0.003	483
	(0.366)	(0.040)	(0.041)	(0.066)	(0.049)	
Fraction of main supplier of consumables ever given credit	0.279	0.092*	0.042	0.010	0.036	483
	(0.406)	(0.052)	(0.042)	(0.066)	(0.040)	
Fraction of main supplier of consumables giving credit regularly	0.133	0.072**	0.038	-0.001	0.031	483
	(0.324)	(0.036)	(0.028)	(0.048)	(0.037)	
Trade credit access index	0.000	0.168	0.171*	0.192	-0.028	483
	(1.000)	(0.126)	(0.099)	(0.178)	(0.105)	
Has defaulted or delayed payment in the past 2 years	0.094	0.006	0.015	0.008	0.000	599
	(0.294)	(0.030)	(0.033)	(0.049)	(0.028)	

Notes: This table presents OLS estimates of treatment effects (intent-to-treat). The sample is the 599 retail shops with whom we conducted in-person or phone survey at endline for some outcome variables, and the 483 retail shops with whom we conducted in-person survey for other outcome variables (i.e. only those that could be found at baseline, had stayed within the study area, and consented to an in-person survey), as can be seen from the sample sizes. Outcome variables are listed on the left. Trade credit access index is the Anderson index of variables measuring endline trade credit access (ever / regularly getting credit from any supplier, number and fraction of suppliers giving credit ever / regularly, total value of purchase on credit from suppliers, fraction of purchase on credit from suppliers). 'Credit report treatment effect' refers to the difference between credit report treatment shops and pure control shops. 'Spillover effect' refers to the difference between spillover and pure control shops. 'Information treatment effect' refers to the difference between information only treatment shops and pure control shops. 'Pooled treatment effect' refers to the difference between credit report treatment shops and all other shops. Columns (2) and (3) include strata fixed effects, and columns (4) and (5) includes cluster fixed effects. All standard errors are clustered at the cluster level (except for column (4) where it is not clustered) and in parentheses. We also control for important baseline variables related to financial access and supplier credit that have imbalance at baseline (see footnote to Table 6 for a list). All monetary values are in USD. * denotes significance at 10%, ** 5%, and *** 1% levels.

Table 14: Trade Credit and Business Outcomes (continued)

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel B. Treatment Effects on Other Business Outcomes						
Sales in the last month	1471.604	-15.847	335.856	372.710	-410.735*	392
	(1904.319)	(249.671)	(286.559)	(417.918)	(231.719)	
Not knowing sales at endline	0.109	0.022	0.077	-0.020	-0.010	483
	(0.315)	(0.052)	(0.069)	(0.061)	(0.036)	
Profit in the last month (reported, USD)	180.167	-41.524	-38.305	-38.827	-7.142	331
	(198.398)	(25.244)	(35.495)	(38.634)	(41.453)	
Not knowing profit at endline	0.297	0.003	0.035	-0.015	0.015	483
	(0.460)	(0.064)	(0.075)	(0.080)	(0.045)	
Profit in the last month (calculated from revenue and costs, USD)	283.464	93.413	161.996	183.620	123.360	391
	(994.396)	(149.967)	(234.451)	(236.725)	(242.312)	
Monthly value of purchase from main suppliers of consumables	2054.375	-366.906	-253.815	118.472	-252.028	483
	(3389.914)	(447.740)	(493.296)	(504.246)	(292.333)	
Number of main suppliers of consumables	1.516	-0.024	-0.039	0.029	0.014	483
	(0.713)	(0.082)	(0.120)	(0.117)	(0.071)	
Panel C. Treatment Effects on Bank Loan Outcomes						
Applied for any bank loan in the past 2 years	0.271	-0.016	0.008	-0.026	-0.033	593
	(0.447)	(0.052)	(0.054)	(0.068)	(0.045)	
Volunteered to share credit report with any bank when applying for loan	0.000	0.009	0.010	0.021	-0.011	659
	(0.000)	(0.006)	(0.007)	(0.017)	(0.012)	
Number of bank loans applied for in the past 2 years	0.483	-0.119	-0.110	-0.174	-0.010	659
	(1.149)	(0.091)	(0.107)	(0.138)	(0.073)	
Number of bank loans received in the past 2 years	0.506	-0.130	-0.090	-0.167	-0.015	593
	(1.171)	(0.095)	(0.110)	(0.147)	(0.080)	
Total borrowing from banks in the past 2 years	712.941	-109.609	-257.997	-228.772	144.941	593
	(2080.724)	(255.148)	(191.817)	(232.435)	(146.698)	
Average size of bank loan received in the past 2 years	2156.304	-371.623	-1.2e+03	77.847	683.533	162
	(3701.180)	(1472.134)	(1017.429)	(1327.212)	(530.401)	
Average size of bank loan application in the past 2 years	2515.072	-260.680	-1.8e+03	-354.546	1006.879*	172
	(4446.903)	(1629.007)	(1307.945)	(1532.552)	(518.489)	

Notes: See notes to the previous table.

Table 15: Trade Credit Outcomes for a Subset of Shops

	(1) Mean of pure control shops (S.D.)	(2) Credit report treatment effect (Std. Err.)	(3) Spillover effect (Std. Err.)	(4) Information treatment effect (Std. Err.)	(5) Pooled treatment effect (Std. Err.)	(6) N
Panel A. Treatment Effects on Trade Credit Outcomes						
Asked any supplier for credit	0.301	0.095*	0.108**	0.001	0.004	578
	(0.462)	(0.053)	(0.048)	(0.076)	(0.047)	
Volunteered to share credit report with any supplier	0.000	0.058**	0.000	0.000	0.065***	578
	(0.000)	(0.022)	(.)	(.)	(0.018)	
Ever got credit from any main supplier of consumables	0.355	0.084	0.047	0.033	0.026	462
	(0.482)	(0.061)	(0.060)	(0.085)	(0.050)	
Gets credit regularly from any main supplier of consumables	0.145	0.070*	0.078*	0.036	-0.018	462
	(0.355)	(0.037)	(0.042)	(0.067)	(0.045)	
Fraction of purchases made on credit from main supplier of consumables	0.186	0.043	0.040	0.062	0.009	462
	(0.332)	(0.042)	(0.028)	(0.056)	(0.032)	
Monthly value of purchases made on credit from main supplier of consumables	309.148	110.072	134.056**	387.971*	-13.014	462
	(982.358)	(94.479)	(64.729)	(232.406)	(89.394)	
Number of main supplier of consumables ever given credit	0.355	0.103	0.080	0.063	0.031	462
	(0.482)	(0.065)	(0.063)	(0.093)	(0.057)	
Number of main supplier of consumables giving credit regularly	0.145	0.078*	0.103**	0.035	-0.012	462
	(0.355)	(0.039)	(0.043)	(0.067)	(0.051)	
Fraction of main supplier of consumables ever given credit	0.280	0.093*	0.029	0.005	0.052	462
	(0.410)	(0.055)	(0.045)	(0.067)	(0.041)	
Fraction of main supplier of consumables giving credit regularly	0.129	0.074**	0.046	-0.007	0.020	462
	(0.326)	(0.035)	(0.029)	(0.048)	(0.039)	
Trade credit access index	-0.012	0.174	0.153	0.204	0.013	462
	(0.999)	(0.126)	(0.106)	(0.186)	(0.102)	
Has defaulted or delayed payment in the past 2 years	0.096	0.011	0.014	0.009	0.004	578
	(0.297)	(0.031)	(0.033)	(0.050)	(0.029)	

Notes: See notes to Table 7, Panel A. The only difference here is we remove shops where the owners asked a specific supplier for credit between baseline and endline.

Table 16: Trade Credit Outcomes (IV Regression)

	(1) Self-reported ownership (Std. Err.)	(2) Self-reported ownership (Std. Err.)	(3) Take-up-adjusted ownership (Std. Err.)	(4) Take-up-adjusted ownership (Std. Err.)	N	(5)
Asked any supplier for credit	0.267**	0.024	0.134**	0.017		599
	(0.119)	(0.109)	(0.061)	(0.053)		
Volunteered to share credit report with any supplier	0.177***	0.195***	0.085***	0.092***		599
	(0.054)	(0.045)	(0.027)	(0.022)		
Ever got credit from any main supplier of consumables	0.171	-0.003	0.099	0.011		483
	(0.127)	(0.098)	(0.067)	(0.052)		
Gets credit regularly from any main supplier of consumables	0.132*	-0.004	0.069*	0.002		483
	(0.076)	(0.086)	(0.041)	(0.047)		
Fraction of purchases made on credit from main supplier of consumables	0.079	-0.007	0.047	0.007		483
	(0.090)	(0.061)	(0.047)	(0.034)		
Monthly value of purchases made on credit from main supplier of consumables	240.536	-151.667	128.807	-69.676		483
	(196.397)	(210.845)	(100.441)	(112.571)		
Number of main supplier of consumables ever given credit	0.221*	0.009	0.123*	0.016		483
	(0.132)	(0.112)	(0.070)	(0.060)		
Number of main supplier of consumables giving credit regularly	0.146*	0.009	0.077*	0.010		483
	(0.078)	(0.098)	(0.043)	(0.053)		
Fraction of main supplier of consumables ever given credit	0.212*	0.068	0.119**	0.049		483
	(0.109)	(0.080)	(0.058)	(0.043)		
Fraction of main supplier of consumables giving credit regularly	0.149**	0.068	0.080**	0.043		483
	(0.069)	(0.072)	(0.037)	(0.039)		
Trade credit access index	0.358	-0.060	0.197	-0.015		483
	(0.265)	(0.210)	(0.136)	(0.111)		
Has defaulted or delayed payment in the past 2 years	0.014	0.003	0.005	-0.000		599
	(0.068)	(0.067)	(0.034)	(0.032)		
Control group: pure control only	Y	N	Y	N		

Notes: This table presents IV regressions of the effect of credit report ownership on trade credit outcomes, where being assigned to the credit report treatment is the instrument for credit report ownership. We present two types of comparisons: 'credit report treatment effect', referring to the regression on credit report treatment shops and pure control shops, and 'pooled treatment effect', referring to the regression on credit report treatment shops and all other shops. We use two measures of credit report ownership: self-reported credit report ownership at endline, and a variable that is identical for non credit report treatment shops and adjusted for take-up for credit report treatment shops (i.e. for credit report treatment shops that took up the offer of credit report, this variable equals one even if they did not report owning a credit report at endline). Columns (2) and (4) include strata fixed effects and have standard errors clustered at the cluster level, and columns (3) and (5) includes cluster fixed effects and have robust standard errors. We also control for important baseline variables related to financial access and supplier credit that have imbalance at baseline (see footnote to Table 6 for a list). All monetary values are in USD. * denotes significance at 10%, ** 5%, and *** 1% levels.

Table 17: Heterogeneous Treatment Effects on Trade Credit Outcomes

	(1) Credit report treatment	(2) Credit report treatment x Getting credit from some but not all suppliers at baseline	(3) N	(4) Credit report treatment	(5) Credit report treatment x Getting credit from some but not all suppliers at baseline	(6) N
Asked any supplier for credit	0.095* (0.055)	0.080 (0.115)	288	-0.013 (0.035)	0.160* (0.085)	599
Ever got credit from any main supplier of consumables	0.100 (0.063)	-0.183 (0.153)	228	0.016 (0.062)	-0.096 (0.145)	483
Gets credit regularly from any main supplier of consumables	0.080* (0.040)	-0.186 (0.132)	228	0.025 (0.046)	-0.184 (0.116)	483
Number of main supplier of consumables giving credit regularly	0.079* (0.042)	-0.083 (0.157)	228	0.016 (0.046)	-0.047 (0.159)	483
Monthly value of purchases made on credit from main supplier of consumables	80.920 (106.796)	337.258 (464.370)	228	-91.711 (112.804)	295.451 (528.926)	483
Control group: pure control only	Y	Y		N	N	

*Notes: This table presents estimates of heterogeneous treatment effects (intent-to-treat) by baseline trade credit access. The sample is the 599 retail shops with whom we conducted in-person or phone survey at endline for some outcome variables, and the 483 retail shops with whom we conducted in-person survey for other outcome variables (i.e. only those that could be found at baseline, had stayed within the study area, and consented to an in-person survey), as can be seen from the sample sizes. Outcome variables are listed on the left. Columns (2) to (4) focus on the credit report treatment effect, i.e. comparing credit report treatment shops with pure control shops, and columns (5) to (8) focus on the pooled treatment effect, i.e. comparing credit report treatment shops with all other shops (pure control, spillover, and information only). Columns (2) and (5) presents regression coefficients of the treatment indicator, and columns (3) and (6) present coefficients of the interaction term of the treatment indicator with the indicator for getting credit from some but not all suppliers at baseline (107 out of 659 shops). The regression for columns (2) and (3) include strata fixed effects, and the regression for columns (5) and (6) include cluster fixed effects, All standard errors are clustered at the cluster level and in parentheses. We also control for important baseline variables related to financial access and supplier credit that have imbalance at baseline (see footnote to Table 6 for a list). All monetary values are in USD. * denotes significance at 10%, ** 5%, and *** 1% levels.*

Table 18: Supplier Endline Outcomes

	(1) All suppliers	(2) Distributors	(3) Wholesalers
Panel A. Credit report Knowledge, Attitude, and Experience			
Credit report knowledge: can explain correctly	0.308	1.000	0.217
	(0.466)	(0.000)	(0.417)
Credit report knowledge: only mentioned blacklisting defaulters	0.173	0.000	0.196
	(0.382)	(0.000)	(0.401)
Has seen a credit report	0.269	0.833	0.196
	(0.448)	(0.408)	(0.401)
Thinks credit report has accurate information	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)
Has credit report	0.154	0.667	0.087
	(0.364)	(0.516)	(0.285)
Would pay to renew credit report (among those who have one)	0.875	1.000	0.750
	(0.354)	(0.000)	(0.500)
Would pay to get a credit report (among those who don't have one)	0.318	0.500	0.310
	(0.471)	(0.707)	(0.468)
Panel B. Knowledge on and Demand for Information Sharing Service			
Knows of the credit bureau's supplier credit information sharing service	0.365	0.833	0.304
	(0.486)	(0.408)	(0.465)
Has joined the service	0.038	0.167	0.022
	(0.194)	(0.408)	(0.147)
Would pay to renew subscription (among those who have joined)	1.000	1.000	1.000
	(0.000)	(.)	(.)
Would pay to join (among those who haven't joined)	0.420	0.600	0.400
	(0.499)	(0.548)	(0.495)
N	52	6	46

Notes: This table presents endline outcomes on 52 suppliers: 6 out of the 11 distributors and 46 out of the 56 wholesalers. Standard deviations are in parentheses.