ACCESS TO CREDIT BY HAWKERS: WHAT IS MISSING?
THEORY AND EVIDENCE FROM INDIA

DISSERTATION

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ABSTRACT

The dissertation examines degrees of access to financial services by hawkers and determinants of matching patterns observed between various types of borrowers and lenders (informal, semiformal, and formal). Matches occur when endowments of certain characteristics allow borrowers to engage in transactions at low costs and features of their lending technologies allow lenders to identify creditworthiness at low costs. As salient features of hawkers, dimensions of informality act as barriers to accessing formal credit. The dissertation explores the role of a hawker’s endowment of dimensions of formality (documentation, license, accounting, collateral, social capital) as means to signal creditworthiness and the extent to which lending technologies, along a continuum, rely on dimensions of formality in screening and monitoring borrowers and designing and enforcing contracts.

A theoretical model predicts assortative matching patterns between borrowers and lenders in reflection of asymmetric information and of their heterogeneity in terms of formality, which results in differences in borrower and lender transaction costs. Hawkers possessing higher endowments of formality-related characteristics match with more formal lenders.
The author conducted a survey of hawkers in Mumbai, India. The average age of business is 16 years, and 90 percent of the hawkers never changed location. Their enterprises are small and require little formality. This informality deprives them of low-cost means of signaling creditworthiness to formal lenders. Instead, commercial suppliers are the dominant source of goods on credit, but they do not offer broader arrays of financial services demanded by hawkers.

A probit model examines access to loans (influenced by the number of household income earners and type of good sold). A Heckman two-stage regression explains the amount received (influenced by a license to hawk). An ordered logit regression tests for matching. Hawkers with identification documents, stocks of social capital, and a house are more likely to match with institutional sources of credit. Hindu hawkers are more likely to be institutional borrowers and Muslim hawkers prefer commercial suppliers that do not charge interest.

Policy implications include the encouragement of innovations in lending technologies, improvements in endowments of characteristics that signal creditworthiness, and less uncertainty in the regulation of hawkers.
To my parents

Sunanda Joshi

and

Gajanan Joshi
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CHAPTER 1

INTRODUCTION

This dissertation examines some determinants of the different degrees of access to financial services, in particular credit, by hawkers. Hawkers are low-income entrepreneurs mainly found in densely populated urban informal sectors in developing countries. Given the fragile nature of their activities and the types of assets that they typically accumulate, it is expected that hawkers should encounter, in particularly acute ways, the usual obstacles to the emergence of financial transactions.

At the same time, hawkers develop strong commercial relationships with the suppliers of their merchandise. These relationships offer them access to inventories of goods acquired on credit, for resale, but may also tie them to particular providers of these goods. Moreover, beyond the financing of their inventory, these credit relationships may be weak in facilitating access to the other types of financial services demanded by the corresponding households. Thus, while it is expected that hawking is linked to comparatively ample access to commercial credit from suppliers, the hawking household is expected to have comparatively little access to other financial services. Increased access to these services has the potential, however, to improve household welfare.
Moreover, insufficient liquidity may be a barrier to entry into hawking, particularly for recent migrants from the rural areas. The ability to secure a profitable location seems, however, to be most important in being able to carry on with this business and to find the initial financing from suppliers. Limited access to institutional finance may also constrain the opportunity to expand or even change the type of business, in order to improve the living conditions of the household. Furthermore, opportunities to save in liquid form and to accumulate precautionary reserves are also important for low-income households subject to the risk of frequent adverse shocks. Thus, financial services do matter to hawking households in several ways. The resulting demands for these services are frequently not met, however. A gap of missing financial services persists for this segment of the population.

By its own nature, hawking is among the most informal activities found in large urban centers. Lack of formality represents, in itself, a barrier to access to commercial banking services, traditionally characterized by formality in contract design and enforcement. This dissertation acknowledges various dimensions of informality as salient features of hawkers as demanders of financial services and as potential barriers to accessing these services in formal markets.

In contrast to banks, informal lenders rely on contract design and enforcement practices that do not privilege formality. Some terms of these informal credit contracts, however, are not as attractive, as the loans carry higher interest rates and are smaller and for shorter terms to maturity than in formal markets.
For hawkers with opportunities to expand their business or with other demands for financial services, access to these informal suppliers may not be sufficient. Moreover, informal credit suppliers are more vulnerable to local systemic shocks, making them unreliable as sources of emergency finance.

Given these circumstances, the dissertation acknowledges, on the one hand, the role of an endowment of certain dimensions of formality as a means to improving access to credit for hawkers and, on the other hand, the extent to which alternative lending technologies have different ability to address this challenge, as they rely to a different extent on these dimensions of formality in their screening and monitoring of borrowers and designing and enforcing of contracts.

To examine the challenge of providing access to credit to hawkers, the dissertation adapts a matching model, which explains how different types of hawkers gain access to credit from different types of lenders, given their endowments of relevant dimensions of formality and the nature of the lending technology used by the lender.

There is a large population of hawkers in Mumbai, India, which offers a rich environment for the empirical exploration of these issues. The fieldwork conducted there, nevertheless, discovered that the innovations in lending technology that have been common in expanding the supply of microfinance services in other parts of the world are not found in Mumbai. The existence of this lending technology vacuum was surprising. The dissertation describes the types of matching between borrowers and lenders actually found in this segment of the market, while it also suggests innovations in the institutional environment and in lending technologies that may facilitate the expansion of this dimension of the frontier of institutional finance.
1.1 Background: Hawkers

The existence of a large urban informal sector was explicitly recognized in the early 1970s, with the observation in several developing countries that massive additions to the urban labor force failed to show up in modern employment statistics. Instead, the new entrants created their own employment or worked in small-scale, family-owned enterprises, such as hawking, knife sharpening, rag picking, junk collecting, and so on (Todaro, 1989; Robinson, 2001).

One of the distinctions between the formal and the informal sectors is that employment in the formal sector is in some way protected. That is, the wage level, working conditions, and even the permanency secured in the formal sector are not available, in general, to job seekers in the informal market, unless they manage to cross some barrier to entry (Mazumdar, 1975). Job security, however, has typically facilitated access to credit cards, consumer credit and cooperative credit, as lenders rely on the information on job stability, to grant loans, and on payroll deductions, to enforce contracts. The informal sector, in contrast, entails activities outside of the norms for economic transactions established by the state (such as operation licenses) and formal business practices (such as accounting norms), although these activities are not intrinsically illegal (O’Hara, 1998).

Generally, therefore, the term informal applies to the activities of small or microenterprises operated through individual efforts or aided by the employment of family members and occasionally by outside workers. It includes the production and exchange of goods and services without government business permits, independently of zoning codes, with failure to report and pay tax liabilities, and with non-compliance with
labor regulations governing working conditions, including the provision of social security benefits to their employees (Todaro, 1989). The owners of these enterprises are not burdened, therefore, with the rigid payment of these fringe benefits and can manage the ups and downs of their business more effectively.

Informality usually implies the absence of the formal accounting records and established credit histories used by traditional lenders in their screening of applicants. These informal activities, however, are quite versatile and flexible, with the microentrepreneurs always in search of shifting opportunities, which allows them to deal with risk more effectively and protect their ability to repay better. Given the constraints emerging from their limited assets, they are technically efficient, in a Schultzian way (Schultz, 1964). When they gain access to credit, their willingness to repay is usually strong, as they have few other alternatives to release their credit constraints.

There is usually free entry and exit in urban informal markets, although there may be some barriers to entry into particular hawking locations. Actually, in overcrowded areas, competition is quite strong. These enterprises operate with not much distinction between the household and the business. This forces a lender to evaluate the ability to repay of the whole household unit, taking into account all sources of funds and all the expenditure obligations of the household. Given their vulnerability, these enterprises rely on comparatively costly strategies of income smoothing and consumption smoothing for their management of risk (Alderman and Paxson, 1992; Morduch, 1995). Limited access to formal finance reflects several of these features of hawking enterprises.
The existence of an informal sector can be attributed to various factors. Some informal enterprises have been passed down the generations and the current owners value their independence, while they attempt to avoid the agency costs related to hiring strangers.

Some informal entrepreneurs are skillful in running these enterprises and possess a comparative advantage in working in this sector. Some of these advantages would disappear, however, if they were forced into the rigid framework of excessive regulation, with all of its red tape, corruption, and delays.

The majority of the workers in the informal sector lack, nevertheless, the credentials (such as a certain level of education) and the connections for being part of the formal sector. Some seekers, unable to find a job in the formal sector, may participate in informal activities for short or long periods of time, rather than being fully unemployed.

The informal sector could not exist if there were not a demand for the services it offers. Most poor people in developing countries can afford to buy only the goods and services offered by this sector, which are cheaper, due to the low fixed costs associated with informal enterprises (Bhowmik, 2001).

In India, an important informal occupation is hawking, namely, street vending. For the purposes of this dissertation, hawkers are defined as independent entrepreneurs selling goods and services on small scale in public spaces. They sell a variety of goods, such as fruit and vegetables, garments, electronic items, and many others. They are usually poor, operate in an uncertain business environment, including the arbitrariness of municipal authorities, and face substantial income fluctuations. Hawkers are particularly constrained in terms of their access to a wide variety of financial services.
Within the population of hawkers, there are substantial differences. These distinctions influence their varying degrees of access to financial services. Hawkers differ in terms of their personal characteristics, such as their age and level of education, in addition to the demographic characteristics of their households.

They differ in terms of the age and size of their business and the types of goods sold. They also differ in terms of their endowments of formality-related characteristics, such as the possession of government-issued identification documents or a license to hawk, their account keeping methods, and their stock of social capital, which includes membership in formal or informal organizations.

The aim of this dissertation is to test whether these formality-related characteristics are important in determining a hawker’s access to alternative sources of loans or in explaining the lack of access to credit. For this purpose, the dissertation develops a model of matching of borrowers and lenders, based on degrees of formality, and then it tests the resulting hypotheses with data from a sample of hawkers in Mumbai.

1.2 Financial Structure in Developing Countries

Financial services are socially valuable, because they facilitate a more efficient allocation of available resources, a less costly management of risk, and improvements in productive opportunities. Financial services also make it possible for households to synchronize consumption flows with income flows, in order to maximize their intertemporal welfare (Gonzalez-Vega, 1993; Stiglitz, 1993).

Developing countries are characterized by financial dualism, as reflected by the coexistence of formal and informal financial sectors. Dualism is simply a reflection of the fragmentation that characterizes underdevelopment (McKinnon, 1973; Myint, 1985).
The formal financial sector, on the one hand, operates under the rules defined by
the legal system and, frequently, under the regulation and supervision of the monetary
and financial authorities. All transactions are recorded and documented, and contracts are
enforced in the courts of justice.

The informal sector, on the other hand, involves transactions that are small,
flexible, and based on personal contact. Contracts are enforced through non-judicial
mechanisms, and the transactions typically require no legal documentation.

“The main factor separating formal from informal lenders is that the former are
generally bureaucratic organizations within which there could be problems of monitoring
and control. Informal lenders tend to be individuals or husband-and-wife teams”,
(Siamwalla *et al.*, 1990).

Beyond the dichotomy of the formal-informal sectors, one may distinguish
intermediate sectors of semiformal lenders. This distinction has become important with
the successful emergence of microfinance in several parts of the world. Semiformal
lenders are usually institutional sources of credit that use alternative lending technologies
in reaching non-traditional clienteles. Any lending technology can be defined as a
systematic method of using information and other inputs to deal with the problems
related to the screening of loan applicants, monitoring of borrowers, and design and
enforcement of contracts (Gonzalez-Vega, 1993). Microfinance organizations have
expanded the outreach of institutional finance through innovations in lending
technologies that have made it cost effective to overcome the obstacles to financial
transactions (Gonzalez-Vega, 2003a; Armendariz de Aghion and Morduch, 2005).
The formal sector typically comprises commercial banks, non-bank financial intermediaries, and specialized banks. The informal sector includes friends, relatives, rotating savings and credit associations (ROSCAs), pawnbrokers, moneylenders, traders and other marketing agents.

The semiformal sector encompasses cooperatives, self-help groups (SHGs), microfinance organizations (MFOs) and other non-government organizations (NGOs) that offer one or several types of financial services.

Although lenders can be classified into three broad categories (informal, semiformal and formal), in practice there is a continuum of lending technologies, along which the distinctions evolve gradually, with both the overlapping of some practices and the multiplicity of approaches within categories. Moreover, with the recent success of microfinance, banks and other formal financial intermediaries have begun special programs that are adapting the innovations introduced by MFOs, even in India. In the end, what matter, for the purposes of this dissertation and for the expansion of the frontier of financial services, are the features of the lending technology. Differences in lending technologies according to formality are the core of this dissertation.

1.3 The Problem: Access to Credit by Hawkers

A bulk of research earlier focused on the analysis of rural credit markets in developing countries (Adams, Graham, and Von Pischke, 1984; Aleem, 1990; Hoff and Stiglitz, 1990). Urban unemployment and underemployment, however, have also concerned researchers and the authorities (World Development Report, 1990). The informal sector in urban and peri-urban areas employs a major proportion of the labor force in most developing countries.
Most of the urban poor belong to this informal sector (Ray, 1998). The introduction of microfinance after the mid-1980s has been an ingredient of programs to address these problems (Mosley, 2001). While it has been increasingly recognized that credit cannot solve all of the problems of urban poverty, there is a significant role for finance in these situations (Gonzalez-Vega, 1998a).

Limited endowments of physical capital and fixed assets do not allow participants in the informal sector to offer the traditional collateral required for bank loans, even when they have a legitimate demand for credit. An unsatisfied legitimate demand for credit emerges when a potential borrower has an ability and willingness to repay equivalent to those receiving loans, which cannot be properly perceived and assessed by lenders at a reasonable cost (Gonzalez-Vega, 1998a). Given the paucity of the credit supplied by formal lenders, these individuals depend on informal providers of funds or of goods sold on credit to meet their demand.

Numerous attempts have been made to expand the outreach of financial services to the poor (Robinson, 2001). Microfinance uses a set of innovative technologies to offer financial services to poor people, who cannot pledge the collateral and fulfill other requirements demanded by formal financial intermediaries, but who have the willingness and ability to repay loans, primarily through the income flows generated by their self-employment.

Several dimensions of informality and of poverty associated with microenterprises make the supply of credit a difficult task. Absence of a credit history and financial statements makes traditional bank loans infeasible.
Poverty reduces the chances that the applicant possesses the mortgageable assets required by formal financial technologies. Indeed, credit allocations on the basis of initial wealth endowments preserve the vicious circle of poverty, as those with low levels of human and physical capital are the ones who cannot gain access to the additional command over resources offered by loans.

Access to credit will help in breaking this vicious circle, at least in those cases when the poor possess attractive productive opportunities but do not have enough resources of their own to take advantage of them.

More specifically, this dissertation addresses the following questions: What are the determinants of access to credit for various types of hawkers? What type of matching patterns between borrowers and lenders are currently observed in Mumbai? What combinations of lending technologies and supporting institutions are being successful in Mumbai and which kinds of arrangements, while present in other parts of the world, are absent in Mumbai? What kinds of innovations may be successful in improving the access to financial services of urban informal sector enterprises in this and similar environments?

1.4 Methodology

The overall aim of this dissertation is to investigate how to expand the frontier of finance toward non-traditional clienteles in the urban informal sector of developing countries. Great heterogeneity characterizes this segment of the market. Lenders are heterogeneous in terms of their information about potential applicants, the transaction costs they have to incur in order to lend to different classes of borrowers, and other dimensions of their lending technologies.
In turn, the heterogeneity of borrowers emanates from their ability to demonstrate their creditworthiness and from their endowments of human and physical capital to generate ability to repay loans. Given this heterogeneity, outcomes about access to credit are given by the matching or sorting of lenders and borrowers (Sanchez-Schwarz, 1996).

A match occurs when the endowment of certain characteristics (among which, this dissertation highlights various degrees of formality) of the borrower, allow him to engage in the transaction at a sufficiently low cost while, at the same time, certain characteristics of the lending technology allow the lender to screen the borrower at a sufficiently low cost.

A theoretical model of matching is adapted in the dissertation to establish conditions under which certain matches will occur. Two models are developed. The first model describes the behavior of borrowers and lenders under symmetric information and no transaction costs. For matches to occur, however, transaction costs must be considered. This is accomplished with the extension of the basic results in the second model. In this dissertation, transaction costs are considered for both the borrower and the lender and are associated with their heterogeneity. The theoretical model predicts that hawkers with greater endowments of formality-related characteristics are matched with lenders that are at the higher end of the lending technology continuum, according to the formality of the requirements.

The dataset used in this dissertation comes from primary data collection conducted in Mumbai, India, from June to August of 2004. An ordered logit model is used to estimate the parameters required for testing the matching hypothesis, namely, that hawkers with formality-related characteristics will match with lenders at the higher end
of the lending technology continuum. Key results from the regression analysis are that hawkers who possess identification documents, have larger stocks of social capital, and own their house have a higher probability of being borrowers from formal and semiformal sources.

Religion also plays a role in explaining the matching patterns observed. Muslim hawkers have a higher probability of borrowing from the informal sector as compared to Hindu hawkers who, in turn, have a higher probability of being borrowers from formal and semiformal sources.

1.5 Significance and Organization of the Dissertation

This dissertation fills a gap in the academic development finance literature, which has rarely addressed the challenges of supplying credit in informal urban sectors of countries such as India. It attempts to identify reasons for the limited access to formal and semiformal financial services by urban informal enterprises, by looking at demand and supply behavior. The results should be useful for researchers interested in urban poverty and micro/small enterprise development.

For lending organizations of various kinds, the results of this dissertation may help in the identification and design of innovations in lending technologies to expand their outreach to these marginal clienteles. Policy implications emerge with respect to the value of efforts to eradicate impediments to the emergence of institutions and of the development of the supporting infrastructure that facilitates innovations for delivering financial services to the urban poor.
In the next chapter, the literature on information-related problems in credit markets and on matching models is reviewed. This leads to a discussion of a theoretical continuum and of an international practice continuum of lending technologies. Chapter three adapts two theoretical models of their behavior of borrowers and lenders. A basic model describes their behavior in the absence of transaction costs. Transaction costs emerge when asymmetric information is considered. The second model introduces borrower and lender transaction costs, to allow the development of a theoretical model of matching of borrowers and lenders.

Chapter four discusses the survey methodology and presents a descriptive analysis of borrowers and of the lending technologies used by various types of lenders in Mumbai. The econometric results on access to credit and the matching of borrowers and lenders are presented in chapter five. A probit regression is used to model access to credit by hawkers and an ordered logit model is used to examine the matching patterns. An evaluation of the significance of the study and its policy relevance conclude the dissertation.
CHAPTER 2

THE LITERATURE ON CREDIT MARKETS, LENDING TECHNOLOGIES, AND MATCHING

Financial services are useful as intermediate inputs in processes of market enlargement and integration and as tools in intertemporal resource allocations and the management of risk. They also aid in the accumulation of human and physical capital and in other ways of upgrading productive opportunities (Shaw, 1973; Gonzalez-Vega, 1993). Financial services are particularly important for the integration into markets of those households and firms that have been previously excluded from participation, including those individuals engaged in hawking and other activities in the urban informal sector of developing countries.

Information, incentive, and contract enforcement constraints, however, create obstacles to the emergence of financial markets. These obstacles are particularly daunting in the case of marginal clienteles (Ray, 1998). First, because it is costly to distinguish among loan applicants, lenders face adverse selection (hidden information) problems.

Second, since there are lack of information about the borrower’s behavior after the loan has been granted as well as insufficient mechanisms to constrain this behavior, lenders are threatened by moral hazard (hidden action) problems.
Third, due to the lack of information about the borrower’s repayment decisions and due to opportunistic behavior, lenders must engage in costly verification and contract enforcement. The transaction costs that emerge in efforts to overcome these obstacles and in managing operations are frequently very high, particularly when distances are substantial and transactions are small.

There has been extensive research on the outcomes of incomplete credit markets, particularly in rural areas. Rural credit markets have been at the center of policy intervention in developing countries over the past 40 years (Adams, Graham, and Von Pischke, 1984; Hoff and Stiglitz, 1990; Gonzalez-Vega, 2003a). At least three different conceptual perspectives have been behind these policy interventions.

First, the earlier traditional view focused on monopoly power, in the belief that interest rates are high because of market power. Policymakers were concerned that credit sometimes might not be available at any price. The policy response was to provide cheap institutional credit through state-owned banks.

Second, in contrast to the monopoly view, the perfect markets view assumed that rural credit markets approximately work as competitive markets should and that high interest rates are mostly due to the high risks of default associated with rural credit, particularly because of the incidence of exogenous factors and systemic shocks (Stigler, 1967; Long 1968). The policy recommendation was not to intervene in financial markets. Increasing awareness, however, of the existence of numerous sources of market failure and other problems in financial markets made this approach insufficient as guidance for policymakers.
Third, the contemporary view focuses on information, institutions and incentives paradigms, to examine optimum intervention issues in rural financial markets (Gonzalez-Vega, 1993; Besley, 1994). The imperfect information paradigm acknowledges the following main features of rural credit markets:

1. Screening problems: Borrowers differ in their risk type and lenders do not possess complete and symmetric information to perfectly distinguish among loan applicants. Borrowers differ in terms both of their ability and willingness to repay. Ability to repay depends, in turn, on the activities that borrowers undertake and on their accumulated wealth. Because of asymmetric information, lenders face the challenge of adverse selection and cannot use interest rates to clear the market.

2. Incentive problems: Given asymmetric information, borrowers may engage in opportunistic behavior, creating moral hazard problems for lenders. In their efforts to overcome this, lenders find that it is costly to make sure that borrowers take actions that make repayment more likely. Contract designs that create compatible incentives for borrowers and lenders are required if costly monitoring is to be avoided.

3. Monitoring problems: After the loan is granted, many circumstances may change the borrower’s ability and/or willingness to repay. The lender must incur costly actions to observe these changes in the probability of default and induce borrowers to take corrective action. This includes the high costs of state verification when borrowers are very heterogeneous.
4. Enforcement problems: It is difficult to compel repayment, particularly when the institutional and legal infrastructures are incomplete and court procedures are too expensive. Traditional collateral, even when it exists, may not guarantee repayment.

Stiglitz (1993) describes how financial markets differ from other markets. Market failure is pervasive, due to the public good nature of the information that is at the core of financial markets, and Pareto optimality is thereby not achieved. He suggests that well designed government interventions will not only help financial markets function better but will also improve the performance of the overall economy.

Besley (1994) argues that the concept of constrained Pareto efficiency is more relevant to the analysis of credit markets. The appropriate test of efficiency would still be that a Pareto improvement is impossible, but such an improvement must be sought taking into account the shortcomings of information and enforcement that the market in question has to deal with.

Policy recommendations based on models of imperfect information and incompatible incentives have not been robust, however, while instances of government failure abound (Gonzalez-Vega, 1993 and 2003a). In order to improve the set of assumptions used in the derivation of policy recommendations, therefore, further empirical research is needed. This dissertation examines some stylized facts of the credit markets where hawkers gain access, in the hope that this information may facilitate the derivation of policy recommendations that help to improve the terms and conditions of their participation.
2.1 Urban versus Rural Credit Markets

The information-related problems identified above are common to all financial markets. The extent to which each one of these obstacles influences transactions differs, however, from one type of credit market to another. A number of differences between urban and rural credit markets are relevant for the analysis (Navajas and Gonzalez-Vega, 2003). These differences refer mainly to poor borrowers, who cannot pledge traditional collateral because of wealth or property rights constraints.

Systemic risks are typically more prevalent in rural areas, due to floods, droughts, and other climate shocks. Local price fluctuations are also a source of covariance in outcomes. Systemic risks are not absent in urban areas, however. Climate also matters; for example, heavy rains can affect the sales of hawkers. Activities in urban areas are mostly influenced by macroeconomic shocks. Urban hawkers are also vulnerable to social unrest and to arbitrary changes in regulations and the enforcement of barriers to entry.

Rural activities are seasonal and mainly influenced by agricultural cycles, while hawking may nevertheless reach a peak during the festival and tourist seasons. Because gestation periods are not as long as in agriculture, small frequent payments can be used as a monitoring strategy in urban microfinance (Gonzalez-Vega, 2003b). Tools such as audited financial statements or credit histories rarely exist in both rural and informal urban markets.

Limited information calls for mechanism design that reduces the probability of default. Designing a loan contract is not an easy task, given the heterogeneity of borrowers in terms of their ability to show their creditworthiness and in terms of their
stock of human and physical capital to generate ability to repay and absorb adverse
shocks. Heterogeneous lenders use their comparative advantages in information and
contract enforcement through the lending technologies that they adopt.

2.2 Lending Technology

A lending technology can be defined as a structured method of lending through
the systematic use of information and incentives (Gonzalez-Vega, 2003a; Navajas and
Gonzalez-Vega, 2003). A lending technology primarily consists of the following key
components (Besley, 1994):

1. Given the intertemporal nature of financial transactions and the heterogeneity
of applicants, screening assists the lender in deciding whether to lend or not to
lend and under what conditions. Screening allows the lender to determine the
ability and willingness to repay of the applicant and thereby decide on a loan
amount, including the possible rejection of the application.

2. Contract design ensures incentive compatibility, by making it in the interest of
the borrower to repay, either through fear of loss of the asset pledged as
collateral or through the promise of a valuable relationship in the future.

3. Monitoring helps in determining if the initial ability and willingness to repay
of the borrower has changed, either through sub-optimal diligence or
exogenous shocks.

4. Contract enforcement mechanisms aid in ensuring that the borrower is liable
for default.
Information acquisition and contract design are costly and various types of lenders use different lending technologies to deal with these problems (Gonzalez-Vega, 1998b).

In developed countries, the screening of applicants is easier, as lenders have access to the reports of credit rating agencies and a borrower’s credit history. Standardized information in the form of balance sheets and income statements can be used to screen and monitor borrowers. A strong legal and institutional framework reduces the probability of default.

In developing countries, in contrast, in the absence of credit rating agencies other ways are used to gain access to the information required to complete a contract. Screening is accomplished by engaging in transactions with a known person or with someone who is in the vicinity of the lender, by gaining information through interaction with the neighbors of the borrower, and by trying out, in the sense of granting small loans and judging the borrower’s habits through her behavior during the actual transaction. Monitoring is carried out by frequently visiting the borrower and by the high frequency of the repayment obligations. Enforcement mechanisms are embodied in the transaction through the denial of future loans, damage to social reputation or loss of collateral in case of default (Aleem, 1990).

Pagano and Jappelli (1993) emphasize the exchange of the lenders’ private information about potential borrowers as a mechanism to overcome information problems. Information sharing is more likely to be useful in countries with large credit markets, heterogeneity of borrowers, and low costs of exchanging information.
The existence of credit rating agencies, however, is not yet widespread in developing countries. There, reputation is a substitute for credit bureaus. Membership in formal or informal organizations, such as chit funds or hawkers’ unions, may increase the reputation capital of hawkers.

2.2.1 The Theoretical Continuum of Lending Technologies

It is through different lending technologies that various types of borrowers are matched with various types of lenders. One can construct a continuum of lending technologies, according to the nature of the interactions between borrowers and lenders and to the mechanisms used to design and enforce contracts, ranging from informal to formal transactions. For simplicity, lenders along this continuum may be classified into categories, such as informal, semiformal or formal, but the distinctions evolve gradually, with both the overlapping of some practices and the multiplicity of approaches within categories.

Furthermore, in this dissertation one can recognize at least three expressions of such a continuum. First, there is a theoretical continuum, including all logical combinations of possible screening, monitoring and enforcement strategies. Second, there is a continuum of international practice, including the prevalent lending technologies used in different countries. Finally, there is the continuum of lending technologies actually observed in Mumbai. This chapter elaborates on the theoretical and international practice continuums of lending practices, while chapter four describes the continuum of lending technologies found in Mumbai.
<table>
<thead>
<tr>
<th>Type of Lender</th>
<th>Screening strategy</th>
<th>Monitoring strategy</th>
<th>Compatible incentive design</th>
<th>Enforcement strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal</td>
<td>- Local information acquired at low cost, proximity - Collecting information through neighbors, people at work, referrals and own observations - Trial and error (through repeated transactions)</td>
<td>- Personal visits</td>
<td>- Repeated transactions - Social interaction and connectedness</td>
<td>- Social sanctions - Informal pressures - Termination of relationship</td>
</tr>
<tr>
<td>Semi-formal</td>
<td>- Self selected group formation - Collecting information through neighbors, people at work, references - Preparing simple cash flow projections by loan officer</td>
<td>- Short term to maturity and/or frequent repayment schedules - Regular meetings with clients - Peer inspection through joint liability - Social connectedness</td>
<td>- Collateral Substitutes - Guarantor - Sequential and substantial improvements in terms and conditions of loan after timely repayment - Cash back on timely interest payments - Promise of future relationship - Lack of access to financial services for defaulters - Announcement of defaulters to other organizations - Appropriate loan contract design based on client needs - Supply of deposit facilities for voluntary savings and other financial services</td>
<td>- Social and economic pressures - Termination of relationship - Legal procedures</td>
</tr>
<tr>
<td>Formal</td>
<td>- Audited financial statements - Investment plans - Credit histories and credit reports - Credit scoring</td>
<td>- Inspection - Audited financial statements - Supervised loan disbursements</td>
<td>- Traditional collateral (mortgage on real estate) - Guarantor - Reporting to credit agencies</td>
<td>- Foreclosing on collateral - Court procedures</td>
</tr>
</tbody>
</table>

Table 2.1: The theoretical continuum of lending technologies
The theoretical continuum is a compilation of conceptually possible screening, monitoring, and contract enforcement strategies that can be used by various types of lenders to address the problems of credit markets. It identifies components of possible lending technologies as mechanisms to overcome the difficulties of financial transactions, as these mechanisms increasingly rely on formal contract design and enforcement.

Although these solutions are conceptually valid, they may encounter problems in their application in specific environments or they may show up in particular variants in response to features of the environment. When there are severe barriers to their implementation, they will not be observed in particular localities.

The specific steps and procedures associated with some of the possible combinations of screening, monitoring and enforcement strategies may be known by practitioners and may have been fine-tuned and adopted. Therefore, they will be captured in the continuum of prevalent international practice. Some combinations may not be known, however, or may not have been implemented due to some barrier (political, social, economic or institutional). Innovations in lending technologies help in overcoming these barriers and in introducing new screening, monitoring, contract design, or enforcement strategies to expand the outreach of financial services.

Table 2.1 describes the theoretical continuum of lending technologies. As shown, informal lenders use personal methods to screen applicants (based on local knowledge), monitor borrowers (through visits), and enforce contracts (through informal pressures and threats of no future relationship).
Semiformal lenders use innovations to expand the supply of credit to non-traditional clienteles. These innovations include group lending as a delegated screening and monitoring mechanism (Stiglitz, 1990; Varian, 1990), regular meetings with borrowers, and shorter terms to maturity and frequent payments as monitoring strategies. Semiformal lenders may also use non-traditional collateral, such as informal liens on household goods and reputation, improvements in the terms and conditions of loans with timely repayment as compatible incentives, and the threat of loss of future credit and peer pressure as enforcement strategies, among others. In contrast, formal lenders use standardized information (credit histories) for screening applicants, audited financial statements and inspections to monitor borrowers, and legal procedures to enforce contracts.

2.2.2 The Continuum of International Practice in Lending Technologies

Table 2.2 describes the screening, monitoring, contract design, and enforcement strategies available worldwide. This presentation attempts to document the state of the art in the provision of financial services to the poor through the mitigation of the imperfect information problems peculiar to financial markets. Not all existing practices are captured in this presentation, but most of the standard ones are described here. The lending technologies not specified in the table usually involve variations of those listed. The main purpose of this list is to contrast international practice with the breadth of technologies found in Mumbai.
<table>
<thead>
<tr>
<th>Lender Type</th>
<th>Screening Strategy</th>
<th>Monitoring Strategy</th>
<th>Incentive to Repay</th>
<th>Enforcement Strategy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Friends and Relatives</strong></td>
<td>- Relation or social connectedness</td>
<td>- Proximity - Trust</td>
<td>- Reciprocity</td>
<td>- Exclusion</td>
<td>Extended family, may include remittances</td>
</tr>
<tr>
<td>ROSCA</td>
<td>- Local group - Social connectedness</td>
<td>- Peer pressure - Regular meetings</td>
<td>- Creation of savings in informal setting - Social connections - Safety net</td>
<td>- Social sanctions - Prevention of further participation in a ROSCA</td>
<td>- Extremely informal</td>
</tr>
<tr>
<td>Informal Moneylender</td>
<td>- Local knowledge - Proximity to borrower</td>
<td>- Social connections - Visits</td>
<td>-Open, flexible contracts based on trust</td>
<td>-Social sanctions -Informal pressures</td>
<td></td>
</tr>
<tr>
<td>Pawnbrokers</td>
<td>- Valuation of goods</td>
<td>- Loss of goods</td>
<td>- Keeps goods pawned</td>
<td></td>
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<tr>
<td>Interlinked Transactions</td>
<td>- Local and specialized knowledge</td>
<td>- Frequent transactions</td>
<td>- Interlinked contracts - Marketing monopoly - Liens on crop</td>
<td>- Loss of relationship - Interruptions of supply of inputs - Termination of purchases</td>
<td></td>
</tr>
<tr>
<td>Commercial lenders (Suppliers)</td>
<td>- Local and specialized knowledge</td>
<td>- Frequent transactions</td>
<td>- Supply of goods on credit</td>
<td>- Loss of relationship - Interruptions of supply of goods</td>
<td>- Associated with particular goods</td>
</tr>
<tr>
<td>Self Help Groups</td>
<td>- Self selected group formation by members</td>
<td>- Peer pressure through joint liability - Regular meetings</td>
<td>- Reputation as collateral - Loan conditions at group discretion - Regular meetings, with financial and non-financial benefits</td>
<td>- Social sanctions - Threat of no future relationship - Loss of access to formal finance through groups</td>
<td>- Loans from banks give access to formal credit</td>
</tr>
</tbody>
</table>

**Table 2.2: The international continuum of lending technologies**
Table 2.2 continued

<table>
<thead>
<tr>
<th>Village Banks</th>
<th>Village Banks (FINCA-Costa Rica Approach)</th>
<th>Peer Group Lending or Solidarity Group Programs</th>
<th>Banco Solidario (BancoSol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Self selected group formation</td>
<td>- Village bank formation by members</td>
<td>- Self selected group formation</td>
<td>- Self selected group formation</td>
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<tr>
<td>- Peer pressure through joint liability</td>
<td>- Regular meetings</td>
<td>- Peer pressure through joint liability</td>
<td>- Peer pressure through joint liability</td>
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<tr>
<td>- Frequent repayment schedule</td>
<td>- Peer pressure</td>
<td>- Frequent repayment schedule</td>
<td>- Frequent repayment schedules</td>
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<tr>
<td>- Regular meetings</td>
<td>- Collateral (guarantor/physical asset as mortgage)</td>
<td>- Reputations as collateral</td>
<td>- Reputations with reputation as collateral</td>
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<tr>
<td>- Reputations as collateral</td>
<td>- Regular meetings</td>
<td>- Reputations with regular meetings</td>
<td>- Reputations with regular meetings</td>
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<tr>
<td>- Reputations with financial and non-financial benefits</td>
<td>- Substantial improvements in loan contracts with timely repayment</td>
<td>- Substantial improvements in loan contracts with timely repayment</td>
<td>- Substantial improvements in loan terms and conditions</td>
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<tr>
<td>- Internal account</td>
<td>- Opportunity to save</td>
<td>- Opportunity to save</td>
<td>- Opportunity to save</td>
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<td>- Opportunity to save</td>
<td>- Legal action for default</td>
<td>- Social sanctions</td>
<td>- Social sanctions</td>
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<td>- Social sanctions</td>
<td>- Threat of no future relationship</td>
<td>- Threat of no future relationship</td>
<td>- Threat of no future relationship</td>
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<tr>
<td>- Threat of no future relationship</td>
<td>- Fines and penalties for violation of procedures</td>
<td>- Fines and penalties for violation of terms and procedures</td>
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<td>- Fines and penalties for violation of terms and procedures</td>
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<tr>
<td>- Mainly rural</td>
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<tr>
<td>- Autonomy in decision making (meeting time, penalties, guarantees)</td>
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<tr>
<td>- 15-30 group members</td>
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<td>- Equal loan size and term to maturity</td>
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<tr>
<td>- Typically first loan $50, with 16 weeks as term to maturity and weekly installments</td>
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</tbody>
</table>
| Bank Rakyat Indonesia (BRI) | - Character based lending  
- Local information | - Frequent repayment schedule  
- Short term to maturity | - Opportunity to save  
- Individual loans with no collateral but guarantors | - Social and economic pressures  
- Threat of no future relationship | - Quasi public system with managers as co-owners |
|---------------------------|-------------------------------------------------|--------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Cooperatives | - Local institutions owned, operated by local people  
- Local knowledge through some common bond of affiliation | - Social connectedness | - Character based lending  
- May require no collateral/guarantor/mortgages  
- Provision of low cost loans to members | - Social sanctions or legal procedures when some form of collateral is pledged | - Jointly owned |
| State Owned Subsidized Credit Programs | - Targeted population | - Supervised credit | - Weak incentives with expectation of no repayment | - Loan rescheduling | - Unsustainable |
| Regulated Non Bank Financial Intermediaries | - Information collection (visits) by loan officers  
- Referrals  
- Preparation of cash flow | - Regular visits  
- Monitoring to ensure that borrower risk profile has not changed after the loan disbursement | - Traditional collateral  
- Collateral substitutes (items with high value in use)  
- Long term relationship  
- Personalized treatment by loan officers  
- Appropriate loan sizes and terms catering to borrower demand  
- Quick analysis of applications | - Seizing of collateral  
- Loss of relationship | - Financiera Calpia (El Salvador)  
- Caja Los Andes (Bolivia) |
| Commercial Banks | - Credit bureaus, credit history  
- Financial statements | - Audited financial statements  
- Inspection | - Traditional collateral, and/or guarantors | - Legal, court procedures | - Formality of requirements increases with loan size |
The international continuum begins with the widespread practice of loans from friends and relatives, which carry no specific terms and conditions apart from expectations of reciprocity. In turn, ROSCAs (rotating savings and credit associations) involve others beyond relatives and are used by the poor and non-poor alike in most developing countries. Usually, members know each other well and, although each round may take only weeks, the relationship may last for years.

In random selection ROSCAs, members contribute a fixed sum to a pot, at regularly scheduled meetings, and then take turns in receiving loans from the common pool of funds. In bidding ROSCAs, the member who bids more receives the pot earlier. The bidding can be a pledge of higher contributions to the ROSCA or a one-time side payment to each member (Besley, Coate and Loury, 1993; Bouman, 1994 and 1995).

Moneylenders, pawnbrokers, commercial lenders with interlinked transactions, and some commercial suppliers are informal agents engaged in the provision of credit in the informal sector. The screening mechanisms of moneylenders rely mainly on social connectedness and local knowledge, due to geographic proximity or occupational connections. Frequently, the borrower is tested through trial and error, with the service of small loans sending signals to the lender about borrower behavior (Aleem, 1990; Robinson, 2001). The monitoring mechanisms include random visits to the borrowers either at their residence or place of work. Enforcement is mainly carried out through informal pressures and through the threat of denial of future access to credit.

Using survey data from Pakistan, Aleem (1990) observes that lenders do not engage in loan transactions with someone who has not had previous dealings with them. Applicants who have bought inputs or sold output to the lender are preferred.
Most lenders make further enquiries about the applicant, to gain knowledge about his productive activities and reputation. The borrower is judged through small credit transactions before he may count on further loans. In most countries, moneylending is restricted to the lender’s own community, where he has strong informational advantages. A small local area of influence, however, makes the portfolio of the moneylender subject to systemic risk and other covariance problems (Gonzalez-Vega, 1993).

Pawnbroking is one of the oldest methods of lending. Usually, the pledger sells his pawn at a below market price and has the right to buy it back within a specified period, by paying principal and interest. The lender does not have to assess the borrower’s creditworthiness nor does he have to monitor his behavior. There are no costly procedures to ensure against default, as the pledged item is already in the lender’s possession. From the perspective of borrower, pawnbroking is attractive because of lower transaction costs and low debt load (Bouman and Bastiaanssen, 1992).

According to Udry (1990), “an interlinked transaction exists if two parties engage in transactions in more than one market and the terms of each transaction are set in a single contract.” Examples of interlinked transactions include, among others, a contract between a farmer and a trader, where a trader provides a production loan to the farmer in exchange for marketing the farmer’s product, as well as loans from a landlord to those with whom he has a tenancy or a labor contract. Interlinked transactions are a way to mitigate information problems in credit markets (Bardhan, 1984). They may also be useful in the reduction of transaction costs (Bell, 1988). Esguerra (1993) argues that interlinked transactions act as collateral substitutes.
In the case of commercial lenders, credit is linked to the sale or purchase of commodities. Existing and recurrent business relationships act as screening and monitoring mechanisms. Commercial lenders accumulate information about borrowers through regular sales and/or purchases of commodities. Contracts are enforced through the threat of loss of future relationships and interruptions in the supply of goods.

The next types of lenders in the continuum may be classified as semiformal sources of credit. These lenders reach growing non-traditional clienteles using various innovations in lending technologies. Several of the main types of semiformal lending technologies are briefly discussed below, in the order presented in Table 2.2.

India’s bank linkage program started in 1992, with the creation of self-help groups (SHGs). These groups organize savings and loan facilities among their members, the successful working of which makes them eligible for bank funding. The basic unit is a self-selected group of approximately 15-20 members. This group starts with savings, and the accumulated amounts are used to satisfy the loan demands of some members. Interest rates on loans and deposits are market driven. Group members decide on the amount of savings per member, maximum size of loans, and so on. Regular group meetings (as a monitoring strategy) are held for savings collection, loan disbursement and recoveries, and group decisions. Group liability and peer pressure act as collateral substitutes.

Successful SHGs become eligible for bank loans after six months. Potential access to formal bank loans acts as an incentive for repayment and sustainability. The groups are financed either directly by banks or through an NGO, where the NGO is willing to act as a financial intermediary.
The SHG-promoting institution nurtures these groups, assists them in maintaining accounts, and trains them in the managing of group activities (Seibel and Khadka, 2002; Srinivasan, 2002). With sustainability emerging as an area of concern for SHGs, some NGOs are encouraging the formation of federations, in order to achieve economies of scale and a reduction in operation costs and to facilitate the eventual withdrawal of NGOs in the formation and operations of SHGs.

A federation would facilitate linkages between SHGs and banks/ government agencies/local institutions, improve their bargaining power, and secure access to policymakers (Nair, 2005). Some governance issues may arise, however, depending on the structure of the federation, as has been the case with credit union federations and other cooperative second-level organizations.

The next set of semiformal lenders includes various types of village banking programs. The village banking model was developed in the 1980s in Bolivia (Hatch, 1987). Since its inception, the village banking approach has evolved a lot. In the original model, the process starts with a loan from the village banking institution (VBI) to a group of approximately 30-60 individuals.

The village bank (VB) members are then trained in collecting and disbursing money and they learn how to keep records of all financial transactions. The first individual loan (usually the local currency equivalent of US $ 50) is to be repaid in 16 weekly installments. Members meet regularly (usually weekly), to collect each one’s loan payment, take savings, and transact other business. Frequent meetings are used as a monitoring tool.
Once the loans are repaid by all members, the VB becomes eligible for a new loan of a larger size, typically equivalent to each member’s previous loan plus the amount of her savings. Loan size per borrower increases gradually, until it reaches the ceiling of US $ 300 (usually in a span of three years). The sequential increase in loan size is supposed to create incentives to repay. Members are required to save at least 20 percent of their current loan in each cycle. Failure to repay leads to cut-off from access to additional services, which may be a strong incentive in places where there are no alternatives (Holt, 1993; Outtara, Gonzalez-Vega, and Graham, 1999; Wesley, 2004).

The funds circulating back and forth between the sponsoring VBI and the VB constitute the external account. In turn, the internal account consists of member savings, interest from loans made from member savings (if any), fines charged to members, and member installment payments to the external account. Payments on the loans made with funds from the external account stay in the VB until the end of the loan cycle, when the full amount is repaid to the VBI. In turn, the internal account is mostly used for emergency loans to members. This is a very valuable service, particularly in risky environments where clients do not have other less costly instruments to manage risk and smooth consumption. These loans prevent sales of productive assets or keeping children out of schools during shocks (Maldonado, Gonzalez-Vega, and Romero, 2003).

Originally, it was estimated that eventually the internal account would be sufficient to meet the members’ demand for credit, thereby resulting in graduation of the VB. At this point, the VBI would withdraw its support, to start a new village bank (Holt, 1993).
Such transition has not happened, however, mostly because poor rural communities are wealth constrained. The most important challenge for the VB is to offer a sufficiently attractive product to prevent the desertion of its members.

While emphasis on the poor remains, financial sustainability has become an important objective of most village banking programs worldwide. To accomplish this, there have been many modifications of the original Hatch model. Many programs have increased loan ceilings, focused on urban areas, changed the internal and external accounts management policies, and organized solidarity groups within the village banks, among other innovations (Holt, 1993; Painter and McKnelly, 1999; Dunford, 2002).

FINCA-Costa Rica has been a leading non-conformist example of village banking. Some of its unique features include a minimalist approach to microfinance, with male, literate, rural, agriculture-based members, individual loans with collateral requirements (either a cosigner/s or a physical asset), larger loan sizes with longer terms to maturity, and legal procedures for default (Gonzalez-Vega, Jiménez, and Quirós, 1996; World Bank, 1998). More recently, after advice from OSU, the village banks adopted a corporate structure and abandoned the one person, one vote rule. Substantial growth followed these innovations in organizational design.

Other successful type of group lending, namely the peer group or solidarity group approach, started with the creation of Grameen Bank in Bangladesh. Over the years, these programs have evolved to a great extent. Moreover, some solidarity group institutions have converted themselves into profit making private commercial banks (Gonzalez-Vega et al., 1997).
Group lending technologies have been used with effectiveness in screening applicants in many developing countries beyond Bangladesh. The approach is based on the concept of joint liability, and it has received considerable theoretical attention. Joint liability is a contract in which provision of access to credit to each borrower (private good) is made conditional on group repayment (collective good). Joint liability may induce borrowers in a group to monitor each other, thereby alleviating moral hazard problems (Stiglitz, 1990; Varian, 1990; Matin, 1997; Ghatak and Guinnane, 1999).

Among others, Ghatak (1999) shows how the introduction of group lending contracts may mitigate adverse selection problems. Borrowers within a group generally have perfect information about one other’s projects (That is, about each other’s type). This local information is then embodied in a group-based loan contract that allows an external lender to operate at low cost. Even without collateral, many group-lending programs have achieved high repayment rates. Gonzalez-Vega (2003a) has shown, however, that the efficacy of the group lending technology is not robust in the presence of systemic shocks. Covariance makes systemic shocks universal within the group, and co-insurance is no longer possible.

Besley and Coate (1995) investigate the role of group lending in improving repayment rates, particularly in developing countries where banks have limited sanctions they can use against delinquent borrowers. These authors establish that if social penalties are sufficiently severe, higher repayment rates can be achieved through group rather than through individual lending.
Despite these theoretical predictions, however, recent experience in Bolivia has shown that effective innovations in screening and monitoring strategies can make individual loans to non-traditional clients profitable. Moreover, individual lending technologies are more robust along the business cycle and lead to better long-term repayment records (Gonzalez-Vega, 2003b).

In a typical case of joint liability, individuals come together and form a solidarity group of 3-7 members. Once a group is formed, it is eligible to receive credit from the solidarity group program (SGP). Borrowers in the group decide how much each member will receive, and the total sum is approved by the SGP. Access to subsequent loans depends on successful repayment by all members or, equivalently, of the full group amount, as side transactions are possible.

Timely repayments with frequent installments and in some cases regular attendance at group meetings are stressed. Most solidarity group programs offer savings facilities, a service valued by most members (Otero, 1986; Berenbach and Guzman, 1993).

Grameen Bank in Bangladesh and BancoSol in Bolivia have been two of the best-known solidarity group programs. Although basic solidarity group principles have been followed by both organizations, the implementation methods are quite distinct. Grameen Bank follows the poverty lending approach with donor-funded credit to the poor; BancoSol funds its loans from commercial debt, mobilized savings and for-profit investment, following the financial systems approach (Matin, 1996; Robinson, 2001). There are also important differences in the way the lending technology is implemented.
In Grameen Bank, each solidarity group consists of five members. In turn, a center consists of five to eight groups. All members come together weekly at the center, to meet with a loan officer. In the first few weeks, the members start to save and learn about the Grameen operations. Members engage in physical discipline and recite vows to foster social development and political awareness. Group participation encourages social intermediation, which is otherwise difficult in a fundamentalist Muslim country.

Two members get loans first; another two members get loans one month later. After one additional month, the last member gets a loan. Groups are self-selected and members are jointly liable for each other’s loans. With timely repayments, the terms and conditions of loans improve gradually (Schreiner, 1999). Grameen Bank group members are required to make forced savings and the group can borrow from the forced savings reserve fund in case of emergency. In addition, Grameen Bank can tap special savings funds in case of default.

Thus, the special savings accounts with restrictions on withdrawals function as a type of collateral; that is, Grameen Bank can hold on to the deposits of its clients to minimize the extent of default (Armendariz de Aghion and Morduch, 2005).

BancoSol has been operating in Bolivia since 1987 (at that time, it functioned as PRODEM, an NGO). It was chartered as a commercial bank in 1992. The lending technology adopted earlier by BancoSol emphasized contract design rather than intensive screening and monitoring (Gonzalez-Vega et al., 1997).

Members self select into groups. As they are jointly responsible for each other’s loans, they screen and monitor for the lender. No collateral is required. Loan sizes are small and terms to maturity short, with emphasis on frequent installments, but the
contract’s terms and conditions improve with a good repayment record. Joint liability is strictly enforced, with inevitable loss of future access for all group members if the total amount is not repaid in full.

Well-trained loan officers are major contributors to BancoSol’s success. They survey local areas and acquaint themselves with potential clients and with the purposes for which loans may be demanded. They work closely with the solidarity groups. The technology is based on substantial learning-by-doing by the loan officers. Substantial improvements in the terms and conditions of loans, the promise of a long-term relationship with a reliable and permanent lender, voluntary savings accounts with no minimum balances, and highly personalized services offered to the clientele are some of the most important incentives offered by BancoSol in its solidarity group program (Gonzalez-Vega et al., 1997).

Beginning in 1998, however, BancoSol started making individual loans to its clients, using a guarantor or a lien on movable assets. This was a response to the shortcomings of group credit observed during the recession. Similar lending technologies have been implemented by Banco Solidario in Ecuador, Mibanco in Peru, and a number of other affiliates of ACCION International.

Another category of semiformal lenders are credit cooperatives, which had their origin in 19th Century Germany. Various types include savings-funded credit unions, government-sponsored credit cooperatives, and cooperative banks. Credit unions are primarily local institutions, owned and operated by the local population, using resources generated within the community. For most cooperatives, funds come from member deposits and share capital.
Loan terms and the contracts offered differ significantly across regions and
countries, but some times external funds are used. The most successful credit unions are
those of urban salaried workers. In such credit unions, members know each other and the
enforcement of contracts is easy, as saving deposits and repayment installments can be
deducted from the payroll (Youngjohns, 1983).

Some cooperatives resemble formal institutions, with stringent requirements for
loan approval, including income statements and collateral. Others resemble semiformal
institutions, with technologies intensive in local information and requirements such as
joint liability. Some have adopted innovations in lending technology, such as collateral
substitutes, similar to those developed by microfinance organizations.

Some non-bank financial intermediaries (NBFIs) are quite flexible, innovative,
and closer to the clientele than banks. NBFIs mobilize savings deposits and facilitate the
financing of various activities, but typically they do not accept checking accounts.

Financiera Calpia in El Salvador (converted to a bank in 2004) is one of the most
successful examples of regulated microfinance intermediaries. It mostly lends to
households with a diversified portfolio of income generating activities, with loans
tailored to specific individual demands. The long-term relationship between the
borrowers and the lender is emphasized. Screening is mainly carried out through referrals
and personal visits by the loan officers to the borrower’s residence and place of work.
The loan officer estimates cash flows in order to assess ability to repay. There is very
little red tape involved. The activities of the household are monitored only to make sure
that the risk profile of the borrower has not changed after disbursement.
Financiera Calpia accepts collateral substitutes, such as TV sets or sewing machines. In case of a late payment, the collateral is seized and kept with the organization; if the borrower does not still repay, the good is sold.

Loan officers are the most important link between Financiera Calpia and its borrowers. They are carefully selected and properly trained. They are the main agents for carrying out screening, monitoring, and enforcement activities and receive performance-based salaries (Navajas and Gonzalez-Vega, 2003). Similar lending technologies have been implemented by Caja Los Andes in Bolivia, Financiera Ecuatorial in Ecuador, and a number of other affiliates of Internationale Micro Investitionen (IMI)/Internationale Projekt Consult (IPC).

It may be relevant to discuss subsidized government lending programs, which were popular after the 1950s, as a type of lending technology. The perception was that the market could not be expected to provide either an adequate volume or the desired channeling of funds to priority sectors. Government intervention in the form of cheap institutional credit was introduced, but without accounting for creditworthiness. These policies and technologies led to substantial government failure (Adams, Graham, and Von Pischke, 1984). Credit did not reach the poor in rural communities; instead, the main beneficiaries were the influential elites, who enjoyed massive transfers of subsidies (Gonzalez-Vega, 1976). The loans were treated as political entitlements rather than as business transactions (Robinson, 2001; Gonzalez-Vega, 2003a).

Under these targeted and subsidized credit programs, loans were directed to specific activities, without acknowledging the fungibility of funds (Von Pischke and Adams, 1983).
These programs incurred high supervision costs, as there was a close and continuous monitoring of loan use, but they did not have the ability to evaluate risks. As a result, repayment rates were extremely low. There were no compatible incentives to repay. Contracts were not strictly enforced by public servant bureaucracies, also leading to high default rates. There are examples of these outcomes in India (Besley, 1994).

The Ohio State School strongly criticized this approach and the associated features of financial repression. OSU identified the incorrect assumptions underlying these policy choices, the unrealistic expectations about the capacity of credit programs to achieve their proposed goals, and their negative impact on the viability of financial institutions (Adams, Graham, and Von Pischke, 1984; Gonzalez-Vega and Graham, 1995).

Although Bank Rakyat Indonesia (BRI) is a century-old state-owned commercial bank; it started its microfinance operations under the name of BRI Unit Desa in the early 1980s, when it abandoned its failed targeted and subsidized credit program. Pioneering microfinance technologies, BRI offers individual loans, typically with no collateral but with character references from guarantors. It encourages voluntary savings, and all its loan operations are funded through deposit mobilization. BRI emphasizes small loans with shorter terms to maturity, and it enforces contracts through social pressures from local traditional structures and through the threat of loss of future relationships with the bank.

The success of BRI can be attributed to a great extent to its team of local managers. A scheme of incentives (performance-based remunerations and efficiency wages) has been developed to mitigate the agency problems that may arise in this quasi-
public structure, with each unit desa acting as a profit/loss center. The BRI has set up one of the most successful examples of government-based, profitable financial institutions involved in microfinance, through the design of its incentive-based organizational structure (Chaves and Gonzalez-Vega, 1996; Robinson, 2001).

At the most formal extreme of the lending technology continuum is the traditional commercial banking technology. Formal financial institutions offer a wide range of financial services, but they may not be able to reach the poor, due to the high transaction costs of dealing with small loan sizes and to the difficulties of judging the creditworthiness of informal agents. Commercial banks rely on standardized information to screen applicants and monitor borrowers. They require audited financial statements and/or credit reports. Contract incentive strategies rely mainly on requirements of traditional collateral, particularly mortgages, while contracts are enforced through court procedures (Christen, 1992).

This discussion of international lending practices is relevant for this dissertation because it helps in understanding what lending technologies are not yet being used in reaching hawkers in Mumbai, although they are being implemented in other parts of the world. Various types of clients may be excluded from access to credit for this reason.

Thus, additional innovations in lending technology may be required in order to reach non-traditional clientele in Mumbai. Their efficacy will depend on how they respond to the specific features of the clientele and their risk profiles. Indeed, a review of the local literature and interviews with hawkers in Mumbai show that there is a paucity of microfinance methodologies and a paucity of similar innovative lending technologies in serving urban informal microenterprises.
Microfinance in India is largely built on the existing banking infrastructure established by the government. Government intervention obviated the need for the creation of a new institutional set-up or the introduction of a separate legal and regulatory framework for the promotion and expansion of innovative methods for the provision of financial services (Satish, 2005). In many ways, government intervention crowded out opportunities for non-government intermediaries to enter these markets. Sinha (2005) argues that the outreach of microfinance in India is low relative to the population and to credit demands in this market segment. Additionally, microfinance development in India has been lopsided, with concentration in the southern states.

There may thus be a huge potential for microlending in this environment, which may be tapped only with a better understanding of the types of financial products demanded, types of potential clients, types of potential transactions, types of lending technology that can be used, and the dimensions of institutional support that are available to serve this type of clientele.

2.3. Credit Rationing

Non-interest credit rationing may be used by lenders to deal with information asymmetries. Credit rationing can be broadly defined as the excess demand for loans at the prevailing equilibrium rate of interest (Gonzalez-Vega, 1976; Jaffee and Russell, 1976; Keeton, 1979; Stiglitz and Weiss, 1981; Jaffee and Stiglitz, 1990).

In general, rationing can occur through price or through quantity mechanisms. Price rationing arises when credit markets are cleared through interest rates or through the non-interest terms and conditions of the loan contract (Baltensperger, 1978).
In contrast, quantity rationing, occurs when the borrowers are willing to pay higher interest rates to get larger loan amounts or even just to get a loan and the lender is not willing to accommodate this demand. The heterogeneity of loan contracts, non-simultaneity of transactions, and imperfect information in credit markets may lead to equilibrium situations where an excess demand for credit may persist at the equilibrium interest rates. The following section briefly reviews the main literature on credit rationing, and it suggests a credit rationing framework for the classification of borrowers and non-borrowers, to be used in this dissertation.

Jaffee and Russell (1976) show how imperfect information and uncertainty can lead to rationing in credit markets. They introduce a model with honest borrowers (who want to repay) and dishonest borrowers (who are ready to default when the costs of defaulting are low). The lenders only know the distribution of these two types of borrowers but not the exact type of each individual applicant. In equilibrium, lenders offer contracts with loan sizes smaller than those needed to clear the market.

Using a model of credit rationing based on the inability of the lender to discriminate across borrowers despite the different costs and risks of lending to them, Gonzalez-Vega (1976) shows how credit rationing reduces access to credit in a non-uniform fashion across applicants. In particular, when the inability to distinguish comes from interest rate policies, credit rationing leads to the exclusion of the poorer applicants from access to credit markets.

Stiglitz and Weiss (1981) argue that credit rationing is an equilibrium phenomenon that occurs because, at some point, expected lender profits become an inverse function of the interest rate. Given limited liability, only high-risk borrowers
would be willing to accept loans at high interest rates, as they perceive a low probability of repayment and insufficient penalties from default. This adversely affects the lender’s profits, as it either creates a composition of riskier borrowers (as a result of adverse selection) or encourages borrowers to invest in riskier projects (because of moral hazard). In these circumstances, the bank reduces the number of loans it would make, leading eventually to a rationing equilibrium. Williamson (1987) relies on monitoring costs to produce credit rationing in equilibrium.

Borrowers can use collateral as a signaling device to show their creditworthiness. Low-risk borrowers may be willing to pledge collateral with higher values in order to get lower rates of interest. Bester (1985) argues that, because lenders do not know the type of borrower, in a credit-rationing equilibrium, there is a pool of high-risk and low-risk borrowers. This happens because, when high-risk borrowers do not get loans at high interest rates, they still apply for loans at lower rates of interest.

Most of the credit rationing models found in the literature, do not consider, however, the existence of the informal financial sector. Jain (1999) observes that enterprises in developing countries are active both in formal and informal financial markets. He emphasizes the informational differences between these two sectors. The informal sector has informational advantages over the formal sector; however, the opportunity cost of funds is lower for the formal sector. For the reasons suggested in the literature, borrowers are rationed in the formal sector, but the informal sector still lends to them. Jain argues that banks are more likely to opt for partial financing when the proportion of high-risk borrowers is high. In this case, the volume of transactions increases in informal markets. This also happens when interest rate ceilings are enforced.
Kochar (1997) investigates the extent of credit rationing in rural credit markets in India. She suggests that in order to understand the extent of rationing in the formal sector, information on how many applied and did not receive loans becomes relevant. She argues that the extent of formal sector rationing is less than what is generally assumed, as the reservation cost of informal credit may be less than that of formal credit for some households.

In Kochar’s framework, non-borrowers comprise those households that do not demand credit from the formal or informal sectors as well as those that ask for a loan from the formal sector but are denied and then choose not to apply from the informal sector.

Barham, Boucher and Carter (1996) analyze the extent of rationing by categorizing producers into the following three categories:

1. Fully Constrained: Those who applied but did not receive a loan or those who did not apply due to high transaction costs, insufficient collateral or fear of risk, such as the loss of collateral.

2. Partially Constrained: Those who applied but received less than the amount they requested, given the terms and conditions of the loan contract.

3. Unconstrained: Those who received the full loan amount they desired or those who were not interested in a loan.

Maldonado (2004) argues that households not using credit may not necessarily be quantity rationed and that those using it may be quantity rationed. Therefore, he groups borrowers into the following categories:
1. Price rationed without a loan. These are producers that did not need a loan or that did not apply for a loan because they perceived unattractive costs and benefits from doing so. The terms and conditions of loan contracts seemed too costly from their perspective.

2. Fully quantity rationed. These producers either applied for a loan but were rejected, or they were so risk averse that they did not feel comfortable being in debt, or they did not apply due to their high subjective probability of rejection.

3. Partially quantity rationed. These producers got loan amounts smaller than what they applied for.

4. Price rationed with a loan. These producers received the amount of loan they applied for.

The researcher has to make a decision about which categories of credit rationing are more relevant, depending on the purpose of the enquiry and the availability of data. This dissertation adopts a particular credit rationing framework to describe the categories of formal, semiformal and informal lenders accessed by hawkers in Mumbai.

In this framework, each borrower is designated by the highest (most difficult to reach) source where credit was obtained. Once the highest possible source is identified, no additional ramifications leading to multiple sources of credit are considered, as shown in Figure 2.1.
Figure 2.1: Proposed framework for credit rationing
Those receiving loans from the formal sector are called formal borrowers. Therefore, the category of formal borrowers includes those borrowing exclusively from the formal sector along with those borrowing from the formal sector in combination with other types of lenders (that is, those borrowing from formal and semiformal, formal and informal, and formal, semiformal and informal sources, respectively). The category of semiformal borrowers includes those borrowing exclusively from the semiformal sector (because they did not apply to the formal sector or were rejected there) and those borrowing from the semiformal and informal sectors. Informal borrowers are those borrowing only from the informal sector.

In this dissertation rationing is defined as a rejection once the hawker has applied for credit. Rationing can occur in one or in multiple sectors. Figure 2.1 presents all possible types of rationing categories. Many hawkers may apply only to the semiformal or informal sector, knowing in advance the stringent requirements of the formal sector. Some may not even apply in any sector, due to their pessimism about being accepted by any type of lender. Thus, rationing is more widespread than is acknowledged here.

In this framework, the category of non-borrowers includes those who applied for loans in one or more sectors but were rejected everywhere or those who did not apply, either because they were unconstrained or uninterested or because, given the high transaction costs of doing so, preemptively assumed that they would not receive a loan. Chapter four uses this conceptual framework to classify hawkers into various credit rationing categories and to examine which types of borrowers are matched with which types of lenders.
2.4. Matching

The heterogeneity of agents and imperfect information are the essence of the matching outcomes found in credit markets. Matching has been studied in other contexts, as well, such as the behavior of a single person looking for a marriage partner, students choosing universities, firms looking for employees, and so on (Becker, 1973; Burdett and Coles, 1999).

The theoretical literature on matching can be separated into two branches. The first one is the pure theory of matching, which abstracts from transaction costs and information problems. The second branch attempts to model matching under imperfections (Mortensen, 1988).

Matching can be defined as an adjustment process in which agents on one side of the market make offers to their favorite agents on the other side of the market, who can either accept the offer or reject it in favor of a better one from another agent. The agents whose offers get rejected then make offers to their next most-preferred agents, and the process continues until no rejections are issued (Crawford and Knower, 1981).

An assortative matching pattern is defined as a sorting of agents according to their characteristics. A positive assortative matching is said to hold when the characteristics of those who match are positively related, while a negative assortative matching is observed when these traits are negatively related (Burdett and Coles, 1999).

Evidence of matching is observed in a variety of frameworks. Ghatak (1999) examines matching patterns in the context of group lending. He concludes that, in a group lending contract, risky borrowers end up with risky partners, while borrowers with a high probability of success end up with less risky partners.
Self selection of group members and joint liability can thus be used as a screening and monitoring device, due to the underlying positive assortative matching property of group lending.

Ackerberg and Botticini (2002) examine the empirical implications of a potential matching between principals and agents, by studying data on agricultural contracts between landlords and tenants in early Renaissance Tuscany. These authors find strong evidence of particular types of tenants matching with particular types of landlords, as a consequence of risk sharing. They further argue that estimates that ignore this matching can offer misleading results.

Rural credit markets have been studied extensively in order to understand the matching patterns that exist between borrowers and lenders of various types. Floro and Yotopoulos (1992) study informal credit markets in The Philippines. They highlight the importance of transaction costs and trust, particularly in informal credit markets, and argue that credit markets require an infrastructure of market institutions to operate efficiently. In developing countries, credit markets operate in an infrastructural vacuum which, in turn, is filled by the informal sector. These authors develop quantity closure rules that relate to the economic activities of lenders and wealth positions of borrowers.

They claim that market fragmentation becomes more pronounced in informal credit markets, where farmer lenders match with poor farmers who have a high propensity to default, a smaller marketable surplus, and who are more likely to offer the usufruct of their land in the credit transaction, while trader lenders match with rich farmers, who have sizeable land holdings and higher marketable surplus.
Within the OSU tradition, Nagarajan (1992) argues that the matching between borrowers and lenders occurs due to their occupational specialization. This specialization leads to different abilities to satisfy borrower-specific credit demands and to the effectiveness of diverse collateral substitutes. As in Floro (1987), Nagarajan (1992) finds that trader-lenders in The Philippines allocate a larger proportion of their loans to rich farmers with a marketable surplus, while farmer-lenders allocate more credit to poor farmers, to reduce their labor monitoring costs.

Also within the OSU tradition, Esguerra (1993) develops a model of an informal contract for an agricultural production loan, and he associates loan contract terms and conditions with borrower characteristics. He further extends the model to account for market interlinkages that work as collateral substitutes, in order to understand the pattern of informal credit allocation. He concludes that trader-lenders specialize in lending to farmer borrowers, who produce a marketable surplus, while farmer–lenders specialize in lending to landless agricultural households and small subsistence farmers. Esguerra, Nagarajan, and Meyer (1993) provide further evidence that informal markets are actually composed of small market niches, where lenders and borrowers are matched according to personal or business relationships outside of the credit market.

These models focused, however, on the matching occurring as a consequence of interlinkages between borrowers and lenders in informal rural credit markets. Borrower-lender matchings can occur, nevertheless, even in credit transactions that are not interlinked. This dissertation examines these types of matching in informal urban markets.
In her dissertation at OSU, Sanchez-Schwarz (1996) provides evidence of matching between rural entrepreneurs and formal and informal lenders in Mexico. She shows how lenders specializing in interpreting standard information match with borrowers having higher endowments of standardized information, while informal lenders specialized in acquiring idiosyncratic information match with borrowers that do not possess standardized information. She models the preferences of rural entrepreneurs (potential borrowers) and lenders under different information and lending technologies. For each possible scenario, she derives equilibrium market outcomes as the situation that maximizes the total joint surplus of the borrower and the lender. She then develops a benchmark model of matching of borrowers and lenders accounting for their heterogeneity, based on the resulting transaction costs for the parties involved. She uses a multinomial logit regression to test her hypotheses for rural Mexico.

Sanchez-Schwarz focuses only on the information components of two alternative lending technologies. In contrast, the approach followed in this dissertation takes into consideration a variety of the components of a lending technology, such as information management, incentive design, and enforcement strategies (Navajas, 1999; Navajas, Conning, and Gonzalez-Vega, 2003). This dissertation also distinguishes across various types of lenders and their matching with various types of hawkers.

In turn, hawkers are differentiated mainly on the basis of the formality of their enterprises. Matching is, therefore, the joint outcome of relevant features of the lending technology and of characteristics of hawkers that allow them to show their creditworthiness, as will be further developed in chapter three.
The review of the literature shows a dearth of studies on matching patterns in urban credit markets. This dissertation fills this gap, by studying the matching of formal, semiformal and informal lenders with various types of hawking enterprises in India. The aim is to discover if there are any opportunities for additional innovations in lending technologies to reach informal microenterprises (hawkers), by learning from the existing matching patterns and from potential barriers to additional matching.
CHAPTER 3

A THEORETICAL MODEL OF MATCHING

Determinants of the limited access to credit and other financial services available to hawker and other participants in the urban informal sector of developing countries, such as India, are not well known. A more precise identification of these determinants will be crucial, however, for those authorities that can influence the environment that constrains the emergence of financial transactions in this segment of the market. These authorities may want to improve access to these transactions by particular sectors of the population.

This identification will also be crucial for various types of agents that so far find it difficult to respond to the demands of financial services from hawkers. These agents may either want to improve the welfare of hawkers, as part of their mission, or they may find a profitable business opportunity in doing so. A more enabling environment and new supplies of financial services may improve the lives of hawkers and their families.

A systematic observation of key features of the loan transactions that actually take place in Mumbai can, in turn, offer insights about innovative ways to address challenges in the expansion of the frontier of financial services.
The exercise of chapter 5 attempts to explain the existing matching of some types of borrowers and their lenders as well as identify potential opportunities for matchings that are not currently occurring.

These opportunities for additional transactions could be created, however, if barriers to potentially feasible matchings could be removed or if new lending technologies were introduced. This section develops a conceptual framework for these exercises.

The model of matching used here is based on Sanchez-Schwarz (1996). In turn, her work was derived from Milde and Riley (1988) who, in essence, developed a signaling model. These authors establish the conditions under which loan applicants whose traits are unobservable *ex ante* are sorted *ex post* due to their differing incentives to take risks. They develop a theoretical framework to emphasize the role of signaling in eliminating or reducing the credit rationing of the type present in the work of Jaffee and Russell (1976) and Stiglitz and Weiss (1981).

The model developed by Sanchez-Schwarz addresses the matching of entrepreneurs and lenders in rural credit markets in developing countries. She generates a benchmark model of the interaction between borrowers and lenders under different transaction cost and information structures. This chapter develops a variation of her model, to allow the consideration of urban informal sector borrowers, who differ among themselves in terms of the formality of their business activities and other related characteristics relevant from the perspective of different lending technologies.
The range of attributes of formality observed in urban areas and their influence on lender perceptions about creditworthiness seems to be broader than is typically found in rural areas. This observation about heterogeneity, according to formality, highlights differences between the challenges of lending to the rural and the urban poor.

Indeed, although all informal urban enterprises share some features, such as their small scale of operation, reliance on self or family labor, and their unregulated status, they differ in some important characteristics that matter in showing their creditworthiness to various types of lenders. One key feature is the formality of their enterprise. Formality is defined here as a set of characteristics possessed by hawkers that allow them to signal their creditworthiness to lenders found at the higher end of the lending technology continuum. Some such characteristics include the possession of a government-issued identification document, such as a passport or driver’s license, a government-issued license to hawk, the account keeping method used, such as maintaining accounts in an informal notebook, and their stock of social capital, which includes membership in organizations such as a ROSCA, hawker’s union, cooperative, or political party.

Hawkers that possess larger endowments of these features can be said to have more formal businesses. Thus, hawkers may be classified as formal or informal, based on a set of formality-related characteristics. Those who have a smaller endowment of formality-related characteristics are classified as informal hawkers and those who have a larger endowment are classified as formal hawkers.

Information acquisition and its use in screening and monitoring as well as contract design and enforcement efforts are at the core of any credit technology. The stocks of information available about the activities and other features of very informal hawkers are
different from the information available for less informal hawking enterprises. Informal hawkers do not have established credit histories and do not belong to strong social networks. There is little documented information that a potential lender could use in evaluating their creditworthiness.

In addition, most of this information is idiosyncratic, generated through proximity, frequent dealings, or a previous credit relationship. A large population of heterogeneous and informal enterprises in urban markets is, therefore, a challenge for lenders of all types.

In the case of less informal enterprises, either because they have been in the market for a longer period, have found a need to keep some documentation about their activities, or have built social networks that are important for their survival in the business, some of these information deficiencies have already been overcome. More formal hawking enterprises can invest in making sure that these information shortcomings are reduced, and they have had a chance to establish their reputation over time through their contract performance. The degree of their formality is, in fact, a strong signal of their survival in the market and of the possession of attributes that predict greater probability of success in their economic activities.

This dissertation adapts the model of assortative matching of borrowers and lenders to this urban environment. Matching is defined as a function assigning certain types of borrowers with certain types of lenders. A match occurs when the endowment of certain characteristics allow a borrower to engage in the transaction at a low cost for him and, at the same time, certain characteristics of the lending technology allow the lender to screen this borrower at a low cost.
Informal hawkers do not have the endowments of documentation and collateral needed for a match with an institutional lender, and it will be very expensive for them to try to acquire these documents and fulfill other prerequisites for borrowing. Such loans are prohibitively expensive for them.

At the same time, it will be very expensive for formal lenders to absorb all the costs of evaluating such a small transaction. A more formal hawker possesses an endowment of features related to formality and, therefore, can participate in the transaction at a lower cost for him (because most of these costs are already sunk costs), allowing the lender to use a technology that is cost effective for the institution.

In contrast, the technology of an informal lender allows him to screen, at a comparatively low cost, a hawker endowed only with informal features. Finally, a hawker said to be self-matched does not have access to credit and may be credit constrained, if he has a legitimate demand for loans that remains unsatisfied.

The primary objective of the model is to relate the features of greater formality and the larger stocks of information associated with formal hawking enterprises, as compared to more informal enterprises, to different degrees of access to institutional sources of credit. The exercise acknowledges that the gains from a particular borrower-lender combination vary, on the one hand, because of differences in the lending technologies and contract terms and conditions of the various types of lenders that operate in this segment of the market and, on the other hand, the varied transaction costs of borrowing for different types of hawkers, depending on the formality of their business.
The underlying assumption is that the more formal sources of credit can offer more attractive contract terms and conditions, such as lower interest rates, larger loan sizes, and longer terms to maturity. However, the transaction costs involved may make these contracts unattractive for the informal hawkers attempting to borrow from formal lenders.

The model predicts a positive matching between borrowers and lenders, whereby hawkers with greater formality of their businesses will be matched with lenders whose technologies require larger endowments of formal features. This matching will lead to more formal transactions, which rely on documentation, traditional collateral, and court enforcement of contracts.

Two models are developed. Model I assumes symmetric information and no transaction costs, in order to establish a basis for comparison and to facilitate the derivation of results. Model II introduces asymmetric information and borrower and lender transaction costs. The presence of these costs allows the derivation of the result of assortative matching between various types of hawker-borrowers and lenders in urban credit markets. Additionally, one must consider circumstances that make these costs higher or lower for the parties involved, in a non-uniform fashion. Matches occur if and when costs are low enough for the transactions to emerge. The next two sections describe the assumptions and the notation on which both models I and II are based.
3.1 Assumptions

Various assumptions are made to simplify the presentation of models I and II.

1. Hawkers and lenders live in a risk-neutral world. They are assumed to be risk-neutral agents attempting to maximize their expected profits. This assumption makes the model more manageable, without altering its qualitative results. Essentially, risk-averse individuals may not participate in credit markets, as the cost of risk increases with risk aversion. Fewer transactions would be observed in this case.

2. Lenders offer fixed-debt contracts. That is, the amount of the expected repayment is not contingent upon the final outcome of the hawker’s project, unless it is not sufficient to cover the obligation. In this case, the lender gets a partial repayment. Otherwise, the borrower promises to repay principal and fixed interest only and keeps the entire surplus.

3. A one-period model is adopted for simplicity. Given honesty, as will be assumed below, this is not a problem. With opportunistic behavior, limited time horizons may increase the risk of default.

4. Borrowers are honest and therefore will not engage in strategic default. Default will emerge only as a result of unexpected inability to repay. Nevertheless, Esguerra (1993) has shown that the result of assortative matching between borrowers and lenders holds even in the case of strategic default.
5. Minimum consumption requirements are ignored. Households have various sources of income generation that allow them to take care of minimum consumption needs. This assumption also implies that income from those other sources is not available to repay the loan but that it is completely devoted to the livelihood of the household, which is a senior claim.

6. There is limited liability. There is no other obligation on the part of the borrower, beyond using the proceedings of the project to repay the loan, except to surrender the collateral, when it is pledged.

3.2 Notation

Let \( Q(B; A, \phi, \Theta) \) be a function of the hawker’s sales, where \( B \) is the amount borrowed (loan size), \( A \) is the hawker’s stock of productive assets, \( \phi \) is a set of the borrower’s formality-related characteristics, and \( \Theta \) is an uncertainty parameter representing sales risk. It is assumed, \( Q \) is increasing in all of its arguments; \( \frac{\partial Q}{\partial i} > 0 \) and \( \frac{\partial^2 Q}{\partial i^2} < 0 \) for any input \( i \) and \( \frac{\partial^2 Q}{\partial i \partial j} > 0 \) for any inputs \( i \) and \( j \).

Sales risk arises from idiosyncratic shocks, such as illness of the hawker or when he is a victim of crime, as in a robbery, as well as from adverse systemic shocks, such as bad weather, civil unrest, municipal regulations, and macroeconomic shocks. Sales risk is assumed to be multiplicative in nature. Therefore, \( Q = \hat{\Theta}Q(B; A, \phi) \), where \( \hat{\Theta} \) is a non-negative random variable.
The hawker borrows the amount \( B \) at the interest rate \( r \) at the beginning of the time period. At the end of the time period, the hawker sells his goods at price \( p \) and repays \( (1+r)B \), where \((1+r) = R\) is defined as the interest rate factor.

Let \( p = \tilde{p} \) be a non-negative random variable. Price uncertainty may arise due to changes in the prices charged by the suppliers of goods and from the perishable nature of the products sold. Realization of \( \tilde{p} \) and \( \tilde{\Theta} \) is outside the control of the hawker. Although the hawker’s returns are subject to both price and sales uncertainty, the hawker is mainly concerned with the consequences of uncertain events on his income, not with the processes through which these uncertainties arise. The hawkers are therefore concerned with \( \tilde{p} \tilde{\Theta} \) rather than with the individual components \( \tilde{p} \) and \( \tilde{\Theta} \).

Define, therefore, \( \theta = \tilde{p} \tilde{\Theta} \) as income uncertainty. Let \( \theta \) be a non-negative continuous random variable with a cumulative distribution function \( F_\delta(\theta) \) defined over some finite interval \([\theta, \bar{\theta}]\), where \( \delta \) is the hawker’s risk type. For the case of symmetric information, \( \delta \) is freely observable by lenders. Income risk implies that there is a positive probability of default. There is only involuntary default; i.e., the borrower defaults only when the outcome of his activities is not favorable enough to meet the loan obligation. He does not behave opportunistically. Involuntary default occurs when \((1+r)B > \theta Q\); that is, default occurs when the revenue from sales is not sufficient to cover the loan obligation.
The value of $\theta$ that equates the value of sales with the amount of the hawker’s loan obligation is:

$$\hat{\theta} = \frac{RB}{Q(B, A, \alpha)},$$

(1)

where $\hat{\theta}$ is the critical value of $\theta$ such that, with $\theta < \hat{\theta}$, there is involuntary default. A favorable outcome of $\theta$, when $\theta \geq \hat{\theta}$, makes repayment possible. When there is a favorable outcome, the net earnings of the borrower are given by $\theta Q(\cdot) - RB$, after repayment. If the outcome is not favorable, the borrower receives nothing, as all the proceeds are used to partially repay the loan.

3.3 Model I: The Case of Symmetric Information and No Transaction Costs

Model I assumes that information is symmetric and that there are no transaction costs. This allows a simple derivation of the conditions under which borrowers and lenders maximize expected profits. Next, the model develops the conditions for contract equilibrium. The assumptions of symmetric information and no transaction costs are relaxed later on, with the introduction of lending and borrowing costs.

3.3.1 The Borrower’s Behavior

The hawker’s aim is to maximize his expected profits by choosing a level of $B$ to complement his endowment of productive assets.$^1$ From sections 3.1 and 3.2, the hawker-borrower’s expected profits can be given by the following equation:

$$\max_B \pi = \int_{\theta} \theta Q dF_\delta(\theta) - RB [1 - F_\delta(\hat{\theta})]$$

(2)

$^1$ The presentation here assumes a credit-constrained hawker, who can generate positive net marginal returns from the extra command over the resources allowed by the loan. That is, the case of no demand for credit because of the lack of productive opportunities is ignored.
The first term in the unconstrained optimization problem (2) shows the hawker’s expected gross receipts from his activities, for the case when the loan amount and interest on it can be repaid in full, because $\theta \geq \hat{\theta}$.

The hawker’s profits will be these receipts minus the loan obligation. The second term indicates the amount of the loan obligation if the outcome of $\theta$ is favorable enough to enable the hawker to meet the contractual obligation.

The first-order condition for profit maximization is:

$$\pi_B = \frac{\partial \pi}{\partial B} = \int_{\hat{\theta}}^{\theta} [\theta Q_B(B, A; \phi) - R] dF_{\theta}(\theta) = 0$$  \hspace{1cm} (3)

The first-order condition implies that the profit maximizing loan size ($B^*$) may be represented as a function of the interest rate factor $R$, the borrower’s productive assets $A$, and borrower’ characteristics, including his degree of formality, $\phi$. That is,

$$B^* = B^*(R, A, \phi).$$

Moreover, using the implicit function theorem, the first-order condition in (3) allows the derivation of the demand function, $D_B = D_B(R, A, \phi)$. The corresponding demand curve has a negative slope with respect to the interest rate factor, if credit is a normal good; that is

$$\left( \frac{\partial D_B}{\partial R} < 0 \right).$$  \hspace{1cm} (3)

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2 The implicit assumption is that the borrower can get the full amount of loan he demands. Otherwise, his profits will be less, and he will remain credit-constrained.

3 See the appendix to this chapter for the derivation and relevant proof of the sign of the slope of the demand curve.
The second-order condition for an expected profit maximum is that \( \frac{\partial^2 \pi}{\partial B^2} = \pi_{BB} < 0 \).

\[ \Rightarrow \pi_{BB} = \left\{ Q_{BB} G(\hat{\theta}) + Q_B G_{\hat{\theta}} \hat{\theta}_B + R \frac{\partial e}{\partial B} \right\} [1 - F_{\hat{\delta}}(\hat{\theta})] - \frac{\pi_B}{1 - F_{\hat{\delta}}(\hat{\theta})} f(\hat{\theta}) \hat{\theta}_B < 0 \]  

(4)

where \( G(\hat{\theta}) = \int_{\hat{\theta}}^{\bar{\theta}} \frac{[1 - F_{\hat{\delta}}(\theta)] d\theta}{1 - F_{\hat{\delta}}(\hat{\theta})} \), \( G_{\hat{\theta}} = \frac{\partial G}{\partial \hat{\theta}} \), \( \hat{\theta}_B = \frac{\partial \hat{\theta}_B}{\partial B} \), \( f(\hat{\theta}) = \frac{\partial F}{\partial \hat{\theta}} \).

Milde and Riley (1988) show that, to ensure that the second-order condition for profit maximization holds, the loan elasticity of sales, \( \varepsilon = \frac{B}{Q} \frac{\partial Q}{\partial B} \), should be non-increasing in \( B \) and that \( G(\hat{\theta}) \) should be non-decreasing in \( \hat{\theta} \). These conditions typically apply in the hawker’s market, because of the limited opportunities for expansion.

In this framework, the borrower’s behavior is described by the demand curve \( (D_B) \) and the associated iso-profit curves. The demand curve represents the loan size that maximizes the hawker’s expected profits at a given interest rate factor. In turn, on each one of the borrower’s iso-profit curves, any combination of \( B \) and \( R \) gives him the same level of expected profits. The borrower’s iso-profit curves are concave in the \((B, R)\) space.4

With larger loan sizes and lower interest rates, iso-profit curves to the south-east denote higher expected profits to the borrowers. The slope of the borrower’s iso-profit curve represents the marginal rate of substitution between loan size \( B \) and the interest rate factor \( R \).

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4 See the appendix to this chapter for the relevant proof.
The relationship between the borrower’s demand for credit and his iso-profit curves is shown in Figure 3.1. The figure shows that iso-profit curves down and to the right are associated with higher levels of expected profits. The iso-profit curves attain their maximum points on the demand curve. A horizontal movement to the right from an isoprofit curve such as at $D_B$ denotes a decline in expected profits, because the loan obligation would increase faster than sales revenues would. In order to keep the borrower on the same iso-profit curve, the interest rate must decline. A horizontal move to the left reduces both the loan amount and sales revenues. This must be compensated by a lower interest rate in order to sustain profits.

### 3.3.2 The Lender’s Behavior

Although actual lenders differ both in terms of their lending technologies and their objective functions, it is assumed that the objective of lenders is to maximize their expected profits.
It is further assumed that the lenders offer borrowers a contract maturing in one period, under given terms and conditions. The loan contract consists of the borrowed amount $B$ and the interest rate factor $R$. The lender charges an interest rate $r$, which takes into account the opportunity cost of funds, lending costs and the default risk associated with lending a specific amount. Let the opportunity cost of funds be equal to $I(\omega)B$, where $I = 1 + i(\omega)$ and $i$ is the opportunity cost of lending and $\omega$ is the lender’s type. More formal lenders are assumed to enjoy a lower opportunity cost of funds, which will allow them to offer more attractive contracts.

If the borrower repays the loan, the lender receives $(1+r)B$. However, the lender recovers less than the full amount of the loan if the returns from the borrower’s activities are insufficient to repay the obligation. In this case, the lender gets the receipts from the activities and the borrower gets nothing.

Assuming that lending transaction costs are zero, the optimization problem of the lender is represented by:

$$\text{Max}_{B} \quad g = \int_{\theta} \theta Q(B, A; \phi) dF_\theta (\theta) + RB[1 - F_\theta (\hat{\theta})] - I(\omega)B$$  \hspace{1cm} (5)$$

The first term in the unconstrained optimization problem represents the receipts of the lender if the hawker’s sales fall short of his loan obligation. The second term represents the lender’s receipts if the hawker’s sales income is high enough to make a full repayment. The last term represents the opportunity cost of loanable funds to the lender.

The first-order condition for maximization of the lender’s profits is:

$$\frac{\partial g}{\partial B} = g_B = R - \left[ \int_{\theta} (R - \theta Q_B) dF_\theta (\theta) + I(\omega) \right] = 0$$  \hspace{1cm} (6)$$
Under the assumption of perfect information, the lender’s supply can be derived from the first-order condition in a manner similar to the derivation of the borrower’s demand. The iso-profit curves for the lender show the combinations of $B$ and $R$ that yield the same value of expected profits. For the lender, higher interest rates are preferred. The assumption of symmetric information implies that adverse selection and moral hazard have been ruled out and as a result lender profits will increase with interest rates. Thus, isoprofit curves down and to the left imply lower expected profits.

Figure 3.2: Lender’s supply and iso-profit curves

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5 See the appendix to this chapter for the derivation of the lender’s supply curve and his iso-profit curves.
The lender’s supply curve $S_B$ has a positive slope. With a larger loan size, the probability of default increases, and so should the interest rate charged, to compensate for the larger expected losses (Sanchez-Schwarz, 1996). In the asymmetric information world of Stiglitz and Weiss (1981), however, interest rates can not always be increased for this purpose, as the higher interest rates themselves will increase the risk of default.

In Figure 3.2, the lender’s iso-profit curves are shown along with his loan-supply curve $S_B$. The iso-profit curves are convex around $S_B$ in the $(B, R)$ plane. The turning point of each iso-profit curve corresponds to the loan size that maximizes the lender’s expected profits at a given interest rate. To the right of $S_B$, the risk of granting the loan increases with an increase in loan size, as a larger loan increases the probability of default. Hence, the interest rate must increase, to compensate the lender for the added costs. To the left of $S_B$, any increase in $B$, keeping the same interest rate, increases profits. Hence, the interest rate must decline to keep the lender on the same iso-profit curve. The locus of such minimum turning points of the iso-profit curves is the lender’s supply curve.

With the specific properties of the sales function defined earlier, the iso-profit curve $g = 0$ is everywhere upward sloping. The zero iso-profit curve corresponding to the lender goes through the point $(0, 1+i)$. 

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3.3.3 Contract Equilibrium

This section pulls together the discussion about borrower and lender behavior in credit markets and derives conditions for contract equilibrium. At equilibrium, it is not possible to improve the profits of the lender without reducing the profits of the borrower and vice versa. Graphically, equilibrium is depicted by the tangency of the borrower’s and the lender’s iso-profit curves. The tangency of $\pi = \pi_1$ and $g = 0$ is shown in Figure 3.3 for the case of competitive equilibrium. Let $\pi = \pi_2$ be the reservation profits of the borrower. Assuming a competitive lenders’ market, equilibrium must be on the zero-profits contour for the lender. Since the lender would never accept any contract below this curve, the set of feasible loan contracts is the region between $\pi = \pi_2$ and $g = 0$.

In this framework, the total surplus from the contract can be defined as the summation of the borrower’s and the lender’s profits. The total surplus to be distributed between the two parties is a function of the loan size $B$. Under competition, contract equilibrium can be defined as a situation where the total surplus is maximized. That is,

$$\max_B \pi + g = Q(.) \int_\theta \theta F_\theta (\theta) - I(\omega)B$$

(7)

The total gain from the contract $(\pi + g)$ is maximized by choosing $B^*$ to satisfy the first-order condition for the maximization of the total surplus in (7), as in Milde and Riley (1988). This first-order condition for a maximum is,

$$Q_B(.) \int_\theta \theta dF_\theta (\theta) - I(\omega) = 0$$

(8)
Figure 3.3: Equilibrium in the credit market

Figure 3.3 shows the isoprofit curves of the borrower and the lender and the competitive equilibrium loan contract \((B^*, R^*)\), where the isoprofit curves of the lender and the borrower are tangential to each other at \(E\). Since at equilibrium, the borrower’s isoprofit curve has a positive slope, the competitive equilibrium loan size lies to the left of the borrower’s loan demand curve. Thus, the borrower receives a smaller loan size than what he demands at the prevailing rate of interest. This type of credit rationing occurs because the probability of default increases with larger loan sizes and the lender has no means of recovering the full amount of the loan if the borrower defaults (Esguerra, 1993). Loan size rationing occurs here even with symmetric information and competitive markets because of the assumption of limited liability (De Meza and Webb, 1992).
3.3.4 Comparative Statistics with Formality-related Characteristics

Consider two types of borrowers. They are identical in every respect that matters for their ability and willingness to repay and, therefore, they generate the same demand for credit. They differ, however, in their ability to signal their creditworthiness, such that $\phi_2 > \phi_1$. That is, borrower 2 possesses a larger endowment of formality-related characteristics as compared to borrower 1, which makes it cheaper to signal creditworthiness to a formal lender. An increase in $\phi$ shifts therefore, the zero-isoprofit curve of the lender to the right, as the level of the reservation interest rate decreases (because the costs of lending decrease, due to the better ability of the borrower to respond to the lending technology) for those lenders that have a comparative advantage in lending to more formal borrowers. Given the assumption of competition, the reservation profits are zero in both cases, but $R$ is lower for any $B$ when the borrower has a larger endowment of formality-related characteristics and can get a contract from a formal lender.

In Figure 3.4, the equilibrium loan contract for the hawker with more formal characteristics is at $E_2$. This equilibrium implies a better loan contract, with a larger loan size and a lower interest rate, as compared to the terms and conditions achieved by the more informal borrower at $E_1$. Thus, a larger endowment of formality related characteristics, such as documented information, credit histories, collateralizable assets, or a stock of social capital would allow the hawker to obtain a better loan contract by getting a loan from a more formal lender. That is, the accumulation of this endowment would allow the hawker to shift to a more formal lender and obtain better loan contracts.
Notice that both borrowers are identical except in their ability to signal creditworthiness. Given the same demand for credit, however, the borrower with a smaller endowment of formality experiences a greater extent of credit rationing, as reflected by the larger distance between $E_1$ and the common demand curve than there is between $E_2$ and this demand curve. Moreover, the cost of borrowed funds is higher for the more informal borrower. This means that, in equilibrium, the marginal rate of return of the more informal borrower will be higher than for the more formal borrower and that his ability to take advantage of the same productive opportunity will be less.
Similarly, for two otherwise identical borrowers operating in two different credit market segments, the loan contract terms will differ depending on the ability of the lending technology to identify their creditworthiness. A more cost-effective lending technology will lead to equilibrium contracts such in $E_2$ as compared to $E_1$. The better ability of this technology to identify creditworthiness will result in less credit rationing.

Furthermore, a comparison of equilibrium at $E_1$ rather than at $E_2$ may also be used to represent the consequences of the exercise of market power by a lender, who in this case restricts supply, raising the interest rate factor, and generating profits above zero. The distance between the two isoprofit curves would reflect the degree of market power enjoyed by the lender.

3.4 Model II: The Case of Asymmetric Information and Transaction Costs

This section extends the basic model I, in order to include both the heterogeneity of borrowers and of lenders. Information is now assumed to be asymmetric. This implies that lenders have to engage in screening efforts, to get information about the potential borrowers.

Additionally, when there is asymmetric information there is a possibility of moral hazard, and the lenders have to invest in contract design and costly monitoring, to make sure that the borrower’s initial ability and willingness to repay do not change after the loan is granted. Mechanisms to overcome such information and incentive problems are costly. Contract enforcement costs would also add to the costs of lending, but they are not explicitly considered here because opportunistic default, when the loan becomes due, has been ruled out.
Borrowers also have to spend resources when engaging in credit transactions. They may be ignorant about the credit contracts offered by various lenders. This may lead to search costs, in order to investigate loan contract characteristics and understand the screening criteria of lenders. More importantly, borrowers must spend resources in signaling their creditworthiness and in persuading lenders about their ability to repay. They may also incur costs in developing and protecting their reputation.

3.4.1 Heterogeneity of Lenders

The lender’s market is assumed to be competitive. Lenders are classified in terms of their lending technology, $\omega$. Define $\omega \in [0,1]$. There is a continuum of lending technologies, according to the formality of their requirements. At one extreme, there is an informal technology, completely specialized in the use of personalized information for screening and monitoring. At the other extreme, there is a formal technology, completely specialized in the use of standardized information for screening and of traditional collateral for the introduction of incentives to repay. It is assumed that a formal lender’s opportunity cost of funds is lower than the opportunity cost of funds for informal lenders, as banks have access to a larger pool of loanable funds. Thus, $\frac{\partial l}{\partial \omega} < 0$.

Examples of standardized information are audited income statements, audited balance sheets, and investment plans as well as the certification of clear title and other professional appraisals of the value of collateral. Based on accepted accounting standards and public certification, standardized information can be interpreted by various types of lenders at comparable costs, and it is not affected by the geographical, social and cultural distance between borrowers and lenders.
Idiosyncratic personalized information, in contrast, is gathered as a result of kinship, frequent interaction, and proximity. Each lender will make his subjective valuation in the assessment of creditworthiness. The value of this information is, thus, dependent on the geographic, social and cultural distance between borrowers and lenders (Sanchez-Schwarz, 1996). Local reputation matters.

In the middle of the continuum are various types of innovative lending technologies, such as those used in microfinance. Some of these technologies make use of reputation and non-traditional assets as collateral in screening and contract design. These technologies gather information about clients mainly through the loan officer’s subjective evaluation about the activities and characteristics of potential clients. The value of this information depends on the efficacy of the technology in allowing the loan officer to construct an estimate of the client’s cash flows. Some organizations also make use of innovative incentive mechanisms, such as the joint liability of a group of people.

At the beginning of the continuum there are informal lenders (ω=0), in the middle there are semiformal lenders with some intermediate value of ω, and at the other end there are formal lenders (ω=1).

### 3.4.2 Heterogeneity of Hawkers

Hawkers differ in varied numbers of ways. Age, level of education, the location where they operate, the types of products they sell, and personal traits such as health and diligence are some such variables. For the purposes of this dissertation, hawkers are classified in terms of the formality of their enterprise.
The formality of an enterprise, $\phi$, comprises a set of tangible characteristics, such as the possession of a government-issued identification document, the stock of social capital, a government-issued license for hawking, and the type of account keeping method used.

For a particular form of this relationship, define $\phi = \text{degree of formality}$. Define $\phi \in [0,1]$. At the beginning of the continuum there are informal hawkers (with $\phi \to 0$) and at the other end there are more formal hawkers (with $\phi \to 1$).

### 3.4.3 The Hawker’s Equilibrium

Any credit transaction is the result of the interaction of some demand and supply forces. The demand for credit originates from hawkers who see profitable opportunities and need additional command over resources to complement their own, in order to maximize their profits. Let there be $m$ classes of hawkers $i = 1, 2, ..., m$ and $n$ classes of lenders $j = 1, 2, ..., n$.

Given his screening and monitoring costs, each lender announces a limited set of loan contracts, characterized by a combination of a loan size and a loan interest rate. The loan applicants (potential borrowers) then seek out the best available contract among the available lenders. Let $\pi^i_j(B^i_j, R^i_j)$ be the hawker $i$’s expected profits of borrowing from lender $j$. Different costs of borrowing are associated with each lender type.

For a given $B^i_j$, the total cost of borrowing $R^i_j$ can be represented as follows:

$$R^i_j = R(B^i_j) + \frac{K^i_j(\omega, \phi)}{B^i_j[1 - F_\phi(\theta)]}$$ (9)

where $K^i_j(\omega, \phi) = \text{hawker’s transaction cost of borrowing}$. 

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The supply side of the credit transaction originates from the lenders. Let
\[ g^{\bar{u}}[B^{\bar{u}}, R(B^{\bar{u}})] \] be the expected profits of lender \( j \) of granting a loan to hawker \( i \), where \( R(B^{\bar{u}}) \) is a function that solves for the profit-maximizing interest rate factor charged by lenders for a given loan size.

The heterogeneous set of lenders offers a set of predetermined loan contracts. The relevant menu of loan contracts for the hawker is, therefore, his aggregate perceived supply curve, which is the union of the least-cost portion of each segment of the market.

The perceived supply schedule of loan contracts for a particular type of hawker can be specified as:
\[
R^i = R^i(B) = \text{Min } R^{\bar{u}}[B^{\bar{u}}, A_j, \delta_i, \phi_i, I(\omega_j), L^{\bar{u}}(\omega_j, \phi_i), K^{\bar{u}}(\omega_j, \phi_i)]
\]

where, \( B^{\bar{u}}, A_j, \delta_i, \phi_i, K^{\bar{u}}(\omega, \phi) \) are as defined as earlier and
\[
L^{\bar{u}}(\omega_j, \phi_i) = \text{fixed cost of lending (independent of loan size)}
\]

The hawkers maximize their expected profits by choosing a combination of \( B \) and \( R \), subject to the participation constraints of the lenders. These constraints can be visualized as defined by zero isoprofit contours, because by assumption the lenders are constrained to a competitive solution. In a more general model, reflective of market segmentation, the participation constraints will be given by the lender’s alternative returns on loanable funds.
Hawker $i$ chooses an amount to borrow from lender $j$ in order to maximize his profits. The hawker’s optimization problem in this market can be specified as follows:

$$\max_{B} \pi^{ij} = \int_{\Phi} \theta Q d F_{\theta}(\theta) - RB[1 - F_{\theta}(\theta)]$$

$$\text{s.t. } R^{i} = R^{i}(B)$$

$$B^{ij} \geq 0$$

(11)

The first term in the optimization problem (11) shows the hawker’s expected gross receipts from his activities, in the case when the loan amount and interest on it can be repaid in full. The second term indicates the loan obligation if the outcome of $\theta$ is favorable enough to enable the hawker to meet the contractual obligation and keep a surplus. Given that the hawker chooses the lender that maximizes his expected profits, the problem in (11) can be reformulated as:

$$\max_{j} \max_{B} \pi^{ij} (B^{ij}, R^{ij}(\omega, \phi))$$

$$\text{s.t. } g^{ij}(B^{ij}, R) = 0$$

$$\pi^{ij}(B^{ij}, R) \geq \pi$$

$$B^{ij} \geq 0$$

(12)

The hawker’s aim is to maximize profits by choosing the borrowed amount $B$ in such a way that he receives at least his reservation profits and on the condition that the lender’s profits are set to zero. The optimization problem (12) solves for the hawker choosing the most attractive loan contract and, thereby, results in the choice of a lender of type $\omega_{j}$.
3.5 Lending and Borrowing Cost Functions

The heterogeneity of borrowers and of lenders implies that a given borrower faces different costs of signaling his creditworthiness to alternative potential lenders. The optimal type of lender $\omega_j$ may thus change with the type of hawker $\phi_i$. This fact can be explicitly modeled with the introduction of lending and borrowing costs.

Borrower transaction costs include explicit as well as implicit cost components. With respect to hawker-borrowers, explicit components include expenses such as extra fees and legal services, travel costs, and paying bribes. Furthermore, transaction costs are involved in applying for an ID document and a license, in being a member of formal and/or informal organizations, by paying fees, and in maintaining accounts in more formal ways, among others.

Implicit costs include the opportunity cost of the time spent in traveling and negotiating loan contracts, in attending meetings of the organizations the hawker belongs to, and in making repayments. Repayment costs are substantially reduced when the lender himself visits his clients and/or sends his agents to collect the dues. Transaction costs are incurred irrespective of loan size.

Lending costs include screening costs and costs of collecting repayments. These include the costs of gathering information about the hawker and time and transportation costs spent on collecting repayments. Informal lenders may collect information by visiting their clients and talking to neighboring hawkers or they may just lend to hawkers who have been their clients for a considerable period of time. Semiformal lenders may ask for referrals or may look for non-traditional collateral, such as household goods.
Typically, they estimate the applicant’s cash flow. Finally, formal lenders may ask for income or salary statements, collateral, and/or guarantors, which must be evaluated. Thus, lending costs involve expenses incurred in terms of time spent in collecting and interpreting information on hawkers and/or evaluating collateral (Sanchez-Schwarz, 1996).

It is usually expensive for formal lenders to make personal visits to the applicants and understand their behavior before they enter into a credit relationship with them. Formal lenders may, in contrast, evaluate the creditworthiness of hawkers that possess formality-related characteristics, such as documentation, at comparatively lower costs. For informal lenders it may be easier to deal with applicants who are known to them mainly due to proximity, kinship, or through past or present business relationships. It may, however, be costly for informal lenders to deal with the demand for larger loans from more formal hawkers. Moreover, because informal lenders are wealth-constrained, the opportunity costs of funds will be higher for them than for formal lenders, that mobilize funds from the public.

Transaction costs may be fixed or proportional. Fixed transaction costs do not change with loan size. Proportional transaction costs vary according to loan size. Here, it is assumed that lending and borrowing costs are fixed. Moreover, for simplicity, it is assumed that the screening technology is perfect; this implies that the lenders do not make any errors in the estimation of borrower type (δ), once they spend resources in gathering and analyzing information about the potential borrowers.
For simplicity, it is assumed that there are two types of lenders and two types of borrowers. The model can be easily extended to cases with more than two types of borrowers and lenders, without changing the qualitative results.

Let \( K^h(\omega, \phi) \) = hawker’s transaction cost of borrowing

\[
\begin{align*}
\frac{\partial K(\omega)}{\partial \omega} &> 0, \quad \frac{\partial K(\phi)}{\partial \phi} < 0 \\
\frac{\partial^2 K(\omega)}{\partial \omega^2} &< 0, \quad \frac{\partial^2 K(\phi)}{\partial \phi^2} < 0
\end{align*}
\]  

These inequalities imply that the transaction costs of borrowing increase with the formality of the lending technology. Moreover, as the endowments of documentation and other ingredients related to the prerequisites of a formal lending technology increase for the potential borrower, the transaction costs of borrowing will decrease. The set of such endowments includes human capital, the possession of a government issued license to hawk, a government issued ID document, income statements, balance sheets, and membership in various organizations, among others. For applicants with such characteristics, it is easier to show their creditworthiness to lenders using a more formal lending technology. Because the hawker already possesses these requirements, they represent a sunk cost, and the marginal cost of using them is minimal or zero.

The hawker’s total transaction costs of borrowing are the weighted costs of borrowing from formal \( K^F(\phi) \) and informal lenders\( K^I(\phi) \). For simplicity, let:

\[
K(\omega, \phi) = \omega K^F(\phi) + (1 - \omega) K^I(\phi)
\]  

(14)
Further, let $L(\omega, \phi) = \text{Lender’s fixed cost of lending}$ and:

$$\frac{\partial L(\omega)}{\partial \omega} < 0, \quad \frac{\partial L(\phi)}{\partial \phi} < 0$$

(15)

$$\frac{\partial L^2(\omega)}{\partial \omega^2} < 0, \quad \frac{\partial L^2(\phi)}{\partial \phi^2} < 0$$

Lending costs decline when the lending technology specializes in using standardized information. As the endowment of standardized information and ways for the borrower to fulfill formal prerequisites increase, the costs of lending to that potential borrower decrease. The lender’s total lending costs have two components, the cost of lending to more formal hawking enterprises $L^F(\omega)$ and the costs of lending to informal hawking enterprises $L^{IF}(\omega)$. These two costs are weighted by the type of hawker reached by the lender, $\phi$. Assume, for simplicity, that:

$$L(\omega, \phi) = \phi L^F(\omega) + (1-\phi)L^{IF}(\omega)$$ (16)

The sequence of events is as follows. The borrower maximizes his expected profits by choosing the optimal $B$ (i.e., $B^*$) from each lender and then, in turn, choosing the optimal lender, given the fact that free entry and exit in the lenders’ market restricts lender profits to zero and that the hawker earns at least his reservation level of profits.

### 3.6 Assortative Matching of Borrowers and Lenders

The matching exercise examines how the optimal choice of lender changes with borrower type. The hawker chooses the type of lender $\omega$ that maximizes his profits. The equilibrium credit contract maximizes the total expected surplus ($x^*$) formulated in terms of the sum of the borrower’s and the lender’s expected profits.
In the case of a competitive lenders’ market, the lender’s profits are constrained to zero and the total surplus equals the borrower’s profits minus the sum of borrowing and lending costs. The optimization problem can then be defined as:

\[
\max_{\omega} x^*(\omega, \phi) = \pi(-) - L(\omega, \phi) - K(\omega, \phi)
\]  

(17)

Using (11), (14) and (16) and the condition that \( R = I(\omega) = 1 + i(\omega) \), the first-order condition for maximization of the total surplus is:

\[
x^*_\omega = Q_B E(\theta) \frac{\partial B}{\partial \omega} \frac{dI}{d\omega} - B^* \frac{dl}{d\omega} \left[ 1 + \frac{\partial B}{\partial \omega} \frac{l}{B^*} \right] - \left[ \phi \frac{l}{B^*} - (1 - \phi) L^{IF} \right] - \left[ K^{IF} (\phi) - K^{IF} (\phi) \right] = 0
\]  

(18)

The second-order condition for a maximum surplus requires:

\[
x^*_{\omega \omega} = Q_B E(\theta) B^* I_{\omega \omega} + Q_B B E(\theta) [B^* I_{\omega}]^2 - B^* I_{\omega \omega} \left[ 1 + \frac{\partial B}{\partial \omega} \frac{l}{B^*} \right] - \left[ \phi \frac{l}{B^*} - (1 - \phi) L^{IF} \right] - 2B^* I_{\omega} \frac{d}{d\omega} = 0
\]  

(19)

To determine the nature of matching between borrowers and lenders, it is necessary to verify how \( \omega \) varies with \( \phi \). To examine this, the total derivative is evaluated:

\[
x^*_{\omega \phi} d\omega + x^*_{\phi \phi} d\phi = 0
\]

\[
\frac{d\omega}{d\phi} = -\frac{x^*_{\phi \phi}}{x^*_{\omega \phi}}
\]

\[
x^*_{\omega \phi} = Q_B E(\theta) B^* I_{\omega \phi} - B^* I_{\phi \omega} - [L^{IF} - S^{IF}] - [K^{IF} (\phi) - K^{IF} (\phi)] > 0
\]  

(20)

Thus, inequality (20) shows a positive assortative matching between borrowers and lenders. This implies that a movement towards \( \omega \rightarrow 1 \) is achieved by hawkers with higher formality of enterprise \( \phi \rightarrow 1 \).\(^6\)

---

\(^6\) See the appendix to this chapter for the relevant proof.
According to this prediction, it will be easier for more formal hawking enterprises to gain access to formal lenders than it is for informal hawking enterprises to obtain formal loans. Informal hawkers will match with informal lenders.

3.6.1. Matching with Two Types of Borrowers and Lenders

With a positive relationship between formality of the enterprise and ability to demonstrate creditworthiness to formal lenders, the equilibrium contracts for borrowers with different characteristics are shown in Figure 3.5.

In this figure, in two alternative equilibrium situations, $g_1$ represents the isoprofit curve of an informal lender and $g_2$ represents the isoprofit curve of a formal lender. In order to gain access to the contract offered by the formal lender, the borrower must possess a minimum endowment of formality-related characteristics. The isoprofit curve for the hawker without this endowment is $\pi_1$ and the isoprofit curve of the hawker with the endowment of the formality that is required is $\pi_2$. Only this second hawker can access the contract from the formal lender.

The prediction leads to a contract at $E_1$ in the match between the informal hawker and the informal lender and to a contract at $E_2$ in the match between the formal hawker and the formal lender.
In comparing these two contracts, the interest rate factor charged to more formal borrowers, $R_2$, is lower, while the loan size, $B_2$, is larger as compared to more informal borrowers. The main advantage of formal over informal finance is that formal financial intermediaries have a larger resource base, due to their deposit taking function, and that therefore they can offer a wide variety of financial services (Esguerra, 1993). More formal borrowers have a greater ability to signal their creditworthiness to lenders at the higher end of the continuum and are therefore offered contract terms better than those offered to more informal borrowers.
Figure 3.5 indeed shows that borrowers with characteristics that formal lenders prefer are offered more favorable contract terms. In turn, the contract $E_1$ is offered to hawkers with a limited ability to demonstrate creditworthiness through formality related characteristics. Additionally, in the assumption of identical demands by both types of hawkers, informal types of borrowers, who can only access contracts such as at $E_1$, face more credit rationing than more formal hawkers, who obtain more favorable contracts such as at $E_2$. This is shown in Figure 3.5, as the common borrower’s demand curve, $D_B$, lies to the right of both the contracts, $E_1$ and $E_2$, but the distance from $E_1$ is larger than from $E_2$.

The nature of the equilibrium contracts shown in Figure 3.5 has some policy relevance. Because little is known about more informal types of hawkers, more formal types of lenders will not have incentives to finance such enterprises, even when these enterprises have activities with high marginal rates of return, equivalent or higher than elsewhere. By developing a lending technology that can help evaluate creditworthiness at lower costs, access to finance by informal hawkers could increase and it may be possible to overcome the segmentation inherent in informal finance, increase the level of investment in the sector, and improve the welfare of the poorest.

In figure 3.5, for example, innovations in lending technology equivalent to those associated with microfinance would result in the emergence of a new type of lender (namely, a semiformal lender), with an isoprofit curve that, under competitive equilibrium, will have an intermediate position between $\pi_1$ and $\pi_2$. 

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Those borrowers whose creditworthiness could now be evaluated in a profitable fashion would find it attractive to shift from the informal to semiformal lenders, in order to obtain contracts with better terms, although still not as attractive as those offered by formal lenders. In any actual environment, nevertheless, other terms and conditions of inter-linked contracts may make such a shift unattractive. The opportunity to access several other types of financial services from a financial intermediary may, indeed, be a strong incentive for many hawkers to shift to institutional intermediaries.

The next chapter empirically examines whether the pattern of credit allocation observed for hawkers in Mumbai is a result of the type of economic behavior predicted by the theoretical model. Specifically, the empirical model attempts to test the hypothesis that hawkers with more formality related characteristics are matched with (more formal) lenders at the higher end of the continuum of lending technologies. The empirical exercise will further attempt to determine the specific characteristics of lending technologies that lead to these matching patterns and to identify opportunities for new matches that may result in improvements in the terms and conditions of the contracts accessible to hawkers.
(i) Derivation of the borrower’s loan demand function

Consider,

\[
\pi = \int_0^\theta \theta Q dF_\theta (\theta) - RB[1 - F_\theta (\hat{\theta})] \tag{A.1}
\]

Using integration by parts,

\[
\int_0^\theta \theta dF_\theta (\theta) = \theta F_\theta (\theta) - \int_0^\theta F_\theta (\theta)d\theta
\]

Substituting this into the optimization problem:

\[
\text{Max } \pi = \int_0^\theta \theta Q dF_\theta (\theta) - RB[1 - F_\theta (\hat{\theta})]
\]

\[
\pi = Q(\theta)[\theta - \hat{\theta}F_\theta (\hat{\theta})] - \int_0^\theta F_\theta (\theta)d\theta - \hat{\theta}Q(1 - F_\theta (\hat{\theta}))
\]

\[
\Rightarrow \pi = Q(\theta)[\theta - \hat{\theta}F_\theta (\hat{\theta})] - \int_0^\theta F_\theta (\theta)d\theta - \hat{\theta} + \hat{\theta}F_\theta (\hat{\theta})
\]

\[
\Rightarrow \pi = Q(\theta)[\theta - F_\theta (\theta)]d\theta
\]

\[
\frac{\partial \pi}{\partial B} = \frac{\partial Q}{\partial B} \int_0^\theta [1 - F_\theta (\theta)]d\theta - \hat{\theta}Q(1 - F_\theta (\hat{\theta}))
\]

\[
= QB \int_0^\theta [1 - F_\theta (\theta)]d\theta - R(1 - \varepsilon)[1 - F_\theta (\hat{\theta})] \quad \therefore \hat{\theta}_B = \frac{R}{Q}(1 - \varepsilon)
\]

The first-order condition for profit maximization requires

\[
\frac{\partial \pi}{\partial B} = 0
\]

\[
\Rightarrow QB \int_0^\theta [1 - F_\theta (\theta)]d\theta - R(1 - \varepsilon)[1 - F_\theta (\hat{\theta})] = 0
\]

\[
\Rightarrow b^* = B^* (R, A, \phi)
\]
(ii) Proof that the demand curve has a negative slope

Using the implicit function rule,

\[
\frac{dD_B}{dR} = -\frac{\pi_{BR}}{\pi_{BB}} \tag{A.2}
\]

The second-order condition for profit maximization requires that \(\pi_{BB} < 0\). This implies that the denominator of expression (A.2) must be negative.

Consider the numerator:

\[
\frac{\partial^2 \pi}{\partial B \partial R} = \pi_{BR} = [1 - F_{\beta}(\hat{\theta})]Q_{\hat{\theta}} \frac{\partial G(\theta)}{\partial \hat{\theta}} \hat{\theta}_R + (\varepsilon - 1) < 0, \text{ as } \hat{\theta}_R > 0 \tag{A.3}
\]

⇒ The amount of loan demanded varies inversely with the rate of interest.

(iii) Derivation of the borrower’s iso-profit curve

Consider,

\[
\pi = Q(\hat{\theta}) \int_0^{\hat{\theta}} (1 - F_{\beta}(\theta)) d\theta \tag{A.4}
\]

By differentiating equation (A.4) with respect to \(R\), it follows that:

\[
\frac{\partial \pi}{\partial R} = -[1 - F_{\beta}(\hat{\theta})] \hat{\theta}_R = -B[1 - F_{\beta}(\hat{\theta})] < 0 \tag{A.5}
\]

Implicit differentiation of the expected profits equation in (A.1) yields,

\[
\frac{dR}{dB} = -\frac{\pi_B}{\pi_R} \tag{A.6}
\]

Since the denominator of equation (A.6) is negative, from (A.5), the sign of \(\frac{dR}{dB}\) depends only on the numerator. When expected profits are at a maximum, the borrower’s iso-profit curve has a zero slope.
Since the borrower’s profit is at a maximum on the loan demand curve, this implies that the slope of the iso-profit curve is zero whenever it coincides with the loan-demand curve. To show that the borrower’s iso-profit curve is concave around the demand curve, it must be shown that
\[ \frac{\partial^2 R}{\partial B^2} < 0 \]

Differentiating (A.6):
\[ \frac{\partial^2 R}{\partial B^2} = \frac{[\pi_R \pi_{BB} - \pi_B \pi_{RB}]}{\pi_R^2} \]  \hspace{1cm} (A.7)
Thus, (A.7) is negative when \( \pi_B = 0 \).

(iv) Derivation of the borrower’s loan supply curve
\[ g = \int_0^{\hat{\theta}} [\theta Q(B, A; \phi) dF_\delta(\theta)] + RB[1 - F_\delta(\hat{\theta})] - I(\omega)B \]  \hspace{1cm} (A.8)
The first-order condition for profit maximization implies that:
\[ \frac{\partial g}{\partial B} = g_B = R - \int_0^{\hat{\theta}} (R - \theta Y_B) dF_\delta(\theta) + I(\omega) = 0 \]  \hspace{1cm} (A.9)
The second-order condition for profit maximization yields
\[ g_{BB} = \frac{\partial}{\partial B} \int_0^{\hat{\theta}} \theta dF_\delta(\theta) + R f_\delta(\hat{\theta}) \hat{\theta}_B (\varepsilon - 1) < 0 \]  \hspace{1cm} (A.10)
Using the implicit function rule,
\[ \frac{dS_B}{dR} = - \frac{g_{BR}}{g_{BB}} \]  \hspace{1cm} (A.11)
From (A.9), the denominator is negative. The numerator is positive because \( g_{BR} = -\pi_{BR} \).
This implies that the loan supply curve has a positive slope.

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(v) Derivation of the lender’s iso-profit curve

Differentiating (A.8) with respect to R yields:

\[ g_R = \frac{\partial g}{\partial R} = B[1 - F_\delta(\hat{\theta})] > 0 \quad (A.12) \]

\[ \frac{dR}{dB} = \frac{g_B}{g_R} \quad (A.13) \]

For convexity, it must be shown that \( \frac{\partial^2 R}{\partial B^2} > 0 \).

Totally differentiating the slope of the iso-profit curve in (A.13),

\[ \frac{d}{dB} \frac{dR}{dB} = \frac{(g_B g_{RB} - g_R g_{BB})}{g_R^2} > 0 \text{, when } g_B = 0 \quad (A.14) \]

This implies that the lender’s iso-profit curve is convex in the \((B, R)\) space.

(vi) Proof of assortative matching

Consider \( x^*_{\omega\phi} = Q_{B\phi}E(\theta)B^*_I I_{\omega} - B^*_\phi I_{\omega} - [L^F_{\omega} - S^B_{\omega}] - [K^F_{\phi} - K^I_{\phi}] > 0 \)

The above result is obtained as follows:

(a) Consider the first term, \( Q_{B\phi}E(\theta)B^*_I I_{\omega} \)

\[ \frac{\partial}{\partial \phi}(\frac{\partial Q}{\partial B})E(\theta) > 0 \text{ This condition reflects that profit-maximizing lenders are inclined to} \]

grant larger loan sizes to borrowers who have enterprises possessing larger endowments of formality related characteristics. This claim further holds because \( \pi_{B\phi} = [1 - F(\hat{\theta})][Q_{B\phi}G(\hat{\theta})\hat{\theta} + Q_{B\phi}G(\hat{\theta}) + R\epsilon_{\phi}] > 0 \)
Consider the second part of the first term, $B_t^*I_{\omega}$

\[
\frac{\partial B}{\partial I} < 0, \quad \text{There is an inverse relationship between the amount borrowed and the interest rate paid, which is influenced by the opportunity cost of funds for the lender.}
\]

\[
\frac{\partial I}{\partial \omega} < 0 \quad \text{More formal types of lenders have a lower opportunity cost of funds, due to their access to a wider pool of loanable funds.}
\]

\[\Rightarrow B_t^*I_{\omega} > 0\]
\[\Rightarrow Q_{B}\theta E(\theta)B_t^*I_{\omega} > 0\]

(b) Consider the second term, $-B_t^*I_{\omega}$

\[
\frac{\partial B^*}{\partial \phi} > 0 \quad \text{Hawkers with greater formality of their business are expected to get larger loans, due to their more easily established creditworthiness.}
\]

\[
\frac{\partial I}{\partial \omega} < 0 \quad \text{As shown above.}
\]

\[\Rightarrow -B_t^*I_{\omega} > 0\]

(c) Consider the third term, $-[L_t^L - L_t^{LF}]$

\[
\frac{\partial L_t^L}{\partial \omega} < 0 \quad \text{For the lending technology specializing formal mechanisms to deal with screening, monitoring and contract enforcement, the transaction costs incurred in lending to hawkers with greater formality of enterprises are lower, as formal hawkers can signal information about their creditworthiness more easily, through their licenses or membership in several organizations, for example.}
\]
When the lending technology is more formal, it is very costly for formal lenders to screen hawkers with very little or no documented information about their creditworthiness.

\[-[L^F_{\omega} - L^{IF}_{\omega}] > 0\]

(d) Consider the fourth term, \(-[K^F_{\phi} - K^{IF}_{\phi}]\)

\[\frac{\partial K^F}{\partial \phi} < 0\]

For hawkers with a greater formality of their business, the transaction costs of borrowing from the formal sector are lower. This is because they already have the endowments of standardized information required by more formal types of lenders and possess other dimensions of formality to engage in formal contracts enforceable in courts.

\[\frac{\partial K^{IF}}{\partial \phi} > 0\]

For hawkers with a greater formality of their business, borrowing from the informal sector is comparatively costly. Informal lenders either know the borrower well or are engaged in some kind of business relationship with him. Formal enterprises may find it harder to establish creditworthiness through such mechanisms and may find the contract terms and conditions unattractive.

\[-[K^F_{\phi} - K^{IF}_{\phi}] > 0\]

\[\Rightarrow \text{From (a)-(d), } x^*_{\omega \phi} = Q_{B_{\phi}} E(\theta) B^*_{\phi} I^*_{\phi} - B^*_{\phi} I^*_{\phi} - [L^F_{\omega} - S^IF_{\omega}] - [K^F_{\phi} - K^{IF}_{\phi}] > 0.\]

Thus, given the sign if this inequality, a positive assortative matching is predicted.
CHAPTER 4

HAWKERS AND CREDIT TECHNOLOGIES IN MUMBAI: SURVEY RESULTS

This chapter elaborates on the details of the data set, including the sampling design, the questionnaire, and some fieldwork-related issues, such as interviewer selection and pilot testing. In addition, the chapter describes in detail the lending technologies of various types of lenders found in the urban credit markets of Mumbai. Some of these lenders engage in extensive credit transactions with hawkers, while others do so only to a moderate extent. Lastly, this chapter presents some descriptive statistics based on the data collected from the survey of hawkers.

4.1 Sources of Data

The data used in this dissertation originate from two primary sources: a survey of hawkers and a survey of various types of lenders. This section describes the instruments used in either case.

A survey of hawkers was conducted in Mumbai, India, from June to August of 2004. The city of Mumbai was selected due to its diversity in terms of ethnicity, economic activities, and presence of a large population of hawking enterprises. A total of 364 effective interviews with randomly chosen hawkers were conducted.
For the second data set, a total of 10 open interviews were administered to various types of lenders: moneylenders, commercial lenders, cooperative banks and commercial banks. The main objective of these case studies was to obtain information about the lending technologies of various types of lenders found in the areas where hawkers operate. A flexible questionnaire was therefore used to obtain information on their screening, monitoring, and contract enforcement mechanisms. In the absence of a list of all lenders, *ad hoc* methods, such as personal contacts, were used to select lenders for interview purposes. References from hawkers, union leaders and local residents were used to contact and interview the selected lenders.

The case studies of lenders presented here are by no means exhaustive of what may exist in Mumbai, but they are sufficient from the perspective of the dissertation. No statistical inferences can be drawn from these case studies; nevertheless, they are vital in shedding some light on the lending technologies adopted in informal urban markets. This information, combined with data from the sample of hawkers, will be used to explore the existence and determinants of matching in credit markets.

### 4.1.1 Selection of Interviewers

The data were collected using the personal interview technique. Six interviewers were employed to carry out the task. All of them were students pursuing a Master’s Degree in Economics at the University of Mumbai. Several training sessions were held for all the applicants and each question was thoroughly discussed. All the applicants were then taken to the field, to carry out the interviews on their own under the supervision of the author of the dissertation. Those who performed the best were chosen for the actual fieldwork.
All interviews conducted were checked on a day-to-day basis for any missing data and the interviewers had to revisit or call (if contact information was available) the respondent to collect the missing information.

4.1.2 Sampling Design

A sampling design based on a combination of stratified, cluster and systematic random sampling was used to collect the data. The relevant sample unit was a hawker (that is, the owner of the hawking enterprise). Only the main island of Mumbai (also known as greater Mumbai) was included in the study and not the suburbs. Hawkers from major areas of Mumbai (selected in terms of population density and commercial activity, with the help of statisticians in Mumbai) were randomly interviewed. The preselection of areas did not hamper the quality of the sample chosen, because the hawkers were randomly selected within these areas and all major parts of greater Mumbai were taken into consideration.

The main areas selected constituted the strata and various lanes in these areas formed the clusters. The clusters were selected randomly using a map of Mumbai and the random number tables. The final sample unit was chosen within a cluster using the systematic random sampling method, by interviewing one out of a given number of contiguous hawkers. With high population density in Mumbai, an almost equal number of sample units was chosen from each stratum. The process continued until the desired sample size was achieved. The target number of 300 interviews was chosen for practical reasons, given the resources available.
4.1.3 Pilot Survey

The investigator conducted a pilot survey, in order to check the efficacy of the questionnaire. This exercise was particularly useful in checking the understanding of the questions by the respondents. Information collected through these interviews also helped in further development of the final questionnaire. Five hawkers were interviewed in the pilot survey from various areas of the main island of Mumbai.

4.1.4 Questionnaire Design

Two types of questionnaires were used in the survey: (i) an interview with exit and (ii) a long interview. The interview with an eligible respondent started with an exit questionnaire, which included demographic information on the hawker, information on the hawking business and on whether the hawker had had any loan/s from institutional or informal sources in the five-year period from June 1999 to May 2004. If the respondent had had no access to or had not taken any loans from any of these sources, the interview was terminated.

If the respondent had taken loan/s from either institutional or informal lenders, then he was asked to respond to the long questionnaire (in addition to the exit questionnaire), which included more detailed questions on the hawking business, on household features, on the transaction costs of borrowing from various types of lenders, and on the terms and conditions of loans taken in the previous year (June 2003-May 2004). The last section included a brief set of questions on the saving behavior of the respondent household.

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7 A copy of the questionnaire is available from the author upon request.
Exit interviews were carried out until the target of 300 long interviews was reached. In total, there were 364 effective interviews, with 64 cases of exclusively an exit interview (with no long interview) and 300 cases of a long interview, with their corresponding exit interview.

The original questionnaire was developed in English. It had to be translated into Hindi, to make it understandable to hawkers. It was not left to the interviewers to translate the questionnaire into Hindi at the time of interviewing. This was crucial to reduce interpretation errors across interviewers. The questionnaire was translated with the help of experts and it was revised according to the results of the pilot survey.

4.1.5 Field Experience

Meetings with various academicians at the University of Mumbai were conducted to finalize the sampling plan and the selection of interviewers. In addition, meetings were conducted with some of the hawkers’ union leaders and they were informed about the study and the purpose of the whole investigation. The union leaders were very supportive and had informed their territorial hawkers about the survey.

Each interview lasted about 45 minutes. Hawkers were cooperative once they decided to participate. However, the non-response rate (the respondent being non-eligible because of lack of knowledge about the funding for the business or the actual hawker was not available) was high, at 20 percent, because only the owners of the enterprise were interviewed, based on the assumption that the owner-manager knows better about the intricacies of the business.
The employees of most enterprises either refused to give information about their employers or they claimed that the employer was out of Mumbai and would be back only after a while. Every attempt was made to reach these hawkers, but only with limited success. The actual refusal rate was close to 10 percent.

4.1.6 Strengths and Weaknesses of the Data

The data set used for this study contains more information on hawking and related credit contracts than other previous studies, particularly in the context of India. Every attempt was made to select a representative random sample of hawkers. Additionally, formal, semiformal, and informal lenders were interviewed in order to gain some understanding of their lending technologies. Thus, the data include information on both the demand and supply sides of urban financial markets.

Some weaknesses of the data set must be acknowledged. While the borrowers supplied data on specific credit transactions, crosschecking with the lenders was not possible. In addition, some of the variables, such as the value of sales, may be subject to measurement errors. Special attention was paid to working with the hawker to arrive at accurate estimates. Furthermore, the lender interviews are merely case studies, conducted to obtain information on the various lending technologies. The data set lacks detailed information on lender portfolios and the characteristics of specific loan contracts, but the purpose was not to evaluate the performance of these lenders.

More importantly, there may be some selection bias, because individuals who wanted to be hawkers but could not start their enterprises (in some cases precisely because of lack of access to credit) could not be captured in the survey.
This was also the case for failed enterprises, given the potentially high mortality rates in this sector. Also enterprises that had graduated to become more formal businesses, such as shopkeepers or manufacturers, were not interviewed. This is a consequence of having worked with a sampling framework of hawkers currently in the business. 

There may be, however, barriers to entry as well as unobservable individual characteristics that are related both to the ability to start a business and the ability to persuade a lender about the hawker’s creditworthiness in order to fund the activity. A different kind of survey design would be required in order to evade this selection bias.

No details about loans from friends and relatives were collected, as no specific lending technologies are adopted in such informal transactions, with reciprocity being the only requirement in most cases. Access to these sources of funds is frequent and universal. Additionally, not many details on non-borrowers were collected, due to resource constraints. In retrospect, this prevented a more rich analysis of the differences between borrowers and non-borrowers. For this purpose, the exit questionnaire is just too short. 

This unexpected result was a consequence of design, as the *a priori* expectation was that a large proportion of the population of hawkers did not have access to credit. This presumption, which turned out to be incorrect, introduced too much parsimony in the exit questionnaire, in an effort to economize the scarce resources available. Receiving goods on credit seems to be an almost universal practice among hawkers, while access to other financial services seems to be quite limited. Other forms of finance may be an important way to overcome barriers to entry as well as to graduate out of hawking.
4.2 Background on Hawking

Hawking is one of the most visible informal activities in India. The Ministry of Urban Employment and Poverty Alleviation (2004) estimates the total number of hawkers in India at 10 million. Hawkers provide a low cost, decentralized and highly efficient system for the distribution of goods, covering an incredible variety of products, at prices far below those prevailing in established markets (Ministry of Labour, 2000).

Hawkers not only create their self-employment, but they also generate backward linkages by helping sustain employment in small-scale industries, from which they buy their products to sell. Some also generate employment by hiring people from poorer sections of the population (Bhowmik, 2001).

Some studies estimate that hawkers constitute approximately two percent of the population of a metropolis in India (Ministry of Urban Employment and Poverty Alleviation, 2004). In most Indian cities, hawkers are treated as lawbreakers and as a public nuisance. Municipal corporations and the police attempt to drive them out of the city, as hawkers create hurdles in human and vehicular traffic. The police and municipal authorities carry out frequent raids in the informal markets created by hawkers, seize their goods, and lock-up all confiscated property in municipal yards (Ministry of Labour, 2000). The majority of the hawkers pay bribes to the police and municipal authorities to avoid such confiscation. Contacts and the ability and willingness to pay bribes thus constitute barriers to entry into this sector.

In 1989, the Supreme Court of India ruled that the right to earn a living is a fundamental right and that hawking thus rests on a fundamental right, as long as it does not infringe on the rights of others.
Furthermore, the Supreme Court directed all state governments to develop regulation for hawking, through the creation of hawking and non-hawking zones (Ministry of Labour, 2000). In Mumbai, the creation of these zones led to protests from hawkers, who prefer that these zones be in commercial areas, whereas the municipal authorities located them in residential areas which, in turn, led to protests from residents associations.

The city of Mumbai is the largest metropolis in India, and it also has the largest number of hawkers, approximately 250,000 by conservative estimates (Ministry of Urban Employment and Poverty Alleviation, 2004). The Bombay Municipal Corporation Act of 1950 regulates hawkers in the city. In Mumbai, it is imperative for a person to procure a license in order to hawk on public spaces. Failure of compliance may lead to the confiscation of any products being sold on the streets, without any prior notice. Possession of such a license might have been, therefore, an element of formality to be considered by lenders. However, the city stopped issuing new licenses almost two decades ago and the majority of hawkers today operate without a license.

Hawkers in Mumbai are largely unionized. Unionization is another dimension of formality that may influence matching in credit markets. Despite conflicts between hawkers and municipal corporations, consumers prefer hawkers, because they provide services in convenient places and lots of time and transaction costs are saved in buying from them. Additionally, the goods sold by hawkers are cheaper.
<table>
<thead>
<tr>
<th>City</th>
<th>Lower</th>
<th>Middle</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmedabad</td>
<td>900</td>
<td>1,500</td>
<td>2,000</td>
</tr>
<tr>
<td>Bangalore</td>
<td>800</td>
<td>2,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Kolkata (Calcutta)</td>
<td>800</td>
<td>1,700</td>
<td>2,000</td>
</tr>
<tr>
<td>Mumbai</td>
<td>1,000</td>
<td>2,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Source: Bhowmik (2001)

**Table 4.1: Average monthly purchases (Rupees) from hawkers, according to income groups**

Table 4.1 shows average monthly purchases from hawkers by lower, middle and upper income groups, in Rupees, for four major cities in India (Bhowmik, 2001). Upper income groups in Mumbai spend three times more on goods from hawkers, when compared to purchases by lower income groups. This may be mainly attributed to the fact that hawkers are the only retail outlets for fresh fruit and vegetables in the city.

### 4.3 Descriptive Statistics on Hawkers

The following section elaborates on some descriptive statistics from the sample of hawkers. The features highlighted here are frequently listed among determinants of non-uniform access to credit.

Hawking seems to be a male dominated activity in India, as only 7 percent of the hawkers interviewed are females. This is in contrast to most urban microenterprises in Latin America and Africa, where women operators dominate street vending (Dunn, 1999). This may reflect limited opportunities to work in other sectors.
### DEMOGRAPHICS

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>36.1 (11.5)</td>
<td>35</td>
</tr>
<tr>
<td><strong>Gender (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td><strong>Marital status (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Education (years of schooling)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7.3 (4.0)</td>
<td>8</td>
</tr>
<tr>
<td><strong>Religion (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td><strong>Migration status (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrants</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Native to Mumbai</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td><strong>Hawkers as household heads (%)</strong></td>
<td></td>
<td>74</td>
</tr>
<tr>
<td><strong>Household size (in Mumbai)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.6 (3.0)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Number of household earners</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.9 (1.2)</td>
<td>1</td>
</tr>
</tbody>
</table>

### HAWKING

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of business (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>16.1 (10.3)</td>
<td>15</td>
</tr>
<tr>
<td><strong>Possession of license (%)</strong></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td><strong>Accounting practices (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In head</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>In notebook</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td><strong>Hawking at the same place ever since started (%)</strong></td>
<td>90</td>
<td></td>
</tr>
<tr>
<td><strong>Possession of government issued ID (%)</strong></td>
<td>79</td>
<td></td>
</tr>
<tr>
<td><strong>Average number of days spent in hawking per week</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6.8 (0.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Average number of hours spent in hawking per day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>12.5 (2.7)</td>
<td>12</td>
</tr>
</tbody>
</table>

* Statistics computed with 300 observations; for all other variables, the total number of observations is 364.

Table 4.2: Summary characteristics of hawkers
The male domination of hawking enterprises in Mumbai may, in turn, also be due to the high demands for time and effort required to work in such enterprises. Additionally, women in the informal sector mainly comprise domestic maids. From the detailed interviews carried out with 300 hawkers, it was found that they spend approximately 12 hours a day in hawking and that they work almost all days of the week. The female members of the household may nonetheless help their male counterparts in many cases, if not in all. It is frequent to see household members rotate at the hawking location, but the owner is typically a male head of household.

Hawkers are of all ages, with an average of 36 years. Approximately 25 percent are Muslim, while the rest are Hindus. Religion is an important factor influencing the demand for credit. Some Muslim hawkers claimed that they did not borrow because borrowing is against their religious beliefs.

The majority of these hawkers are married, which is a sign of household stability, while average household size is almost five people. These households are smaller, however, than in the rural areas. Many of them still have links with their rural households of origin. This may help in dealing with potential adverse shocks, given the small number of household members who work in Mumbai. Many of the hawkers in Mumbai (66 percent) are indeed migrants from other parts of the country.

This is not surprising, because Mumbai, as the commercial capital of India, attracts a large pool of people in search of better economic opportunities. For some, hawking seems to have offered such an option. For many, this may be the only option they find in Mumbai.
Approximately four fifths of the hawkers hold a valid, government-issued, identification document (passport, driving license, ration card, and/or voter card), but only 18 percent of the hawkers possess a license to hawk at the place where they are currently operating. Possession of an identification document or a license may serve as a signal of formality to lenders. This does not mean that there are not barriers to entry; rather, these emerge informally. Union membership and other ways of securing entry will thus matter in explaining current levels of access to credit. There seems to be little mobility among hawking enterprises, with 90 percent of them hawking at the same place ever since they started in this business. This is further evidence of the likely existence of barriers to entry, particularly for hawking in prime locations.

Only around 18 percent of hawkers maintain their accounts in a notebook, which is not indeed formal record keeping. The rest maintain their accounts only in their heads. This reflects the size and nature of these enterprises (their operation is typically very informal) and the limited schooling of particularly older hawkers. The small size and informality of hawking does not make it economical to maintain formal accounts. Nevertheless, the absence of accounting does block access to formal sources of credit, whose lending technologies require financial statements. Innovations in lending technology that shift the burden of estimating cash flows to loan officers, as in microfinance, will be useful in this environment.

The average age of the hawking enterprise is 16 years. Age of business may be an important indicator of unobserved entrepreneurial ability and other personal traits. That is, a higher age of business may show the ability to survive in the market as well as the experience and networking needed to participate more effectively in several markets.
Alternatively, it may show lack of opportunity or prerequisites to graduate to a more rewarding activity, particularly when the business has remained stagnant for a long time. Thus, a high age of business may be either a signal of success (survival) or of a dead end (that is, the hawker has no further opportunity to evolve). If this is the case, the age of business will have an ambiguous effect on credit outcomes, except for very young enterprises.

<table>
<thead>
<tr>
<th></th>
<th>AOB ≤ 1</th>
<th>1 &lt; AOB ≤ 3</th>
<th>3 &lt; AOB ≤ 5</th>
<th>5 &lt; AOB ≤ 10</th>
<th>10 &lt; AOB ≤ 20</th>
<th>20 &lt; AOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations‡</td>
<td>9</td>
<td>14</td>
<td>38</td>
<td>76</td>
<td>117</td>
<td>110</td>
</tr>
<tr>
<td>Distribution by AOB (%)</td>
<td>2.5</td>
<td>3.8</td>
<td>10.4</td>
<td>20.9</td>
<td>32.1</td>
<td>30.2</td>
</tr>
<tr>
<td>Formal borrowers</td>
<td>0</td>
<td>0</td>
<td>2.6</td>
<td>3.9</td>
<td>1.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Semiformal borrowers</td>
<td>0</td>
<td>7.1</td>
<td>15.8</td>
<td>9.2</td>
<td>6.8</td>
<td>13.6</td>
</tr>
<tr>
<td>Informal borrowers</td>
<td>77.8</td>
<td>57.1</td>
<td>65.8</td>
<td>64.5</td>
<td>74.4</td>
<td>72.7</td>
</tr>
<tr>
<td>Non-borrowers</td>
<td>22.2</td>
<td>35.7</td>
<td>15.8</td>
<td>22.4</td>
<td>17.1</td>
<td>12.7</td>
</tr>
<tr>
<td>ID card holders</td>
<td>77.8</td>
<td>42.9</td>
<td>63.2</td>
<td>64.5</td>
<td>74.4</td>
<td>72.7</td>
</tr>
<tr>
<td>Hawking at the same place ever since started</td>
<td>88.9</td>
<td>78.6</td>
<td>84.2</td>
<td>90.8</td>
<td>93.2</td>
<td>89.1</td>
</tr>
<tr>
<td>Loans from friends and relatives</td>
<td>44.4</td>
<td>64.3</td>
<td>47.4</td>
<td>42.1</td>
<td>53.8</td>
<td>40.0</td>
</tr>
<tr>
<td>Social capital*</td>
<td>0</td>
<td>14.3</td>
<td>39.5</td>
<td>30.3</td>
<td>44.4</td>
<td>52.7</td>
</tr>
<tr>
<td>Bank account*</td>
<td>0</td>
<td>42.9</td>
<td>55.3</td>
<td>42.1</td>
<td>48.7</td>
<td>51.8</td>
</tr>
</tbody>
</table>

AOB = Age of business in years
‡ Except for the number of observations and distribution by age, all data are in percentages for each age of business category.
* Statistics computed with 300 observations; for all other variables, the total number of observations is 364.

Table 4.3: Access to finance and related statistics by age of business

Additionally, continued presence in a market may help build reputation and generate social capital over time, which facilitate access to credit. This social capital may include membership in various organizations, such as chit funds and hawker unions. Some of these organizations may become sources of funds or of references.
Hawkers with a higher age of business may also be the ones with more valuable collaterizable assets. All of these tangible and intangible assets can be deployed to gain access to more formal sources of credit. Table 4.3 shows different degrees of access to various types of lenders and other features, by differences in the age of the hawking enterprise.

There are very few young hawking enterprises (only 6 percent of them have less than 3 years). This might be in part attributed to a possible selection bias, given by the fact that young enterprises usually show higher mortality rates than established incumbents. If, in addition, there are important barriers to entry, there may be few new entrepreneurs in locations that are already congested and where incumbents may have large advantages over new entrants. Among these advantages, there may be established reputations with suppliers who provide goods on credit. Fewer young hawking businesses will then be observed.

One of the central roles of finance may thus be linked to facilitating entry. Most lenders around the world, however, prefer to lend to established businesses, and Mumbai does not seem to be an exception. Moreover, as shown in Table 4.3, at least two fifths of the hawkers had had loans from friends and relatives, and the proportion was highest for hawking enterprises for one to less than three years old. In most parts of the world, this financial support from the family accounts for a substantial proportion of start ups of enterprises. Friends and relatives are also an important source of emergency credit. The availability of these loans may reduce the risk aversion that delays entering into a new business. Those without the family support to manage the anticipated risk may simply not enter.
One would expect that hawkers with older businesses should be the ones with greater access to institutional loans, social capital, government issued identification documents, and bank accounts. Table 4.3 shows that almost two thirds of the hawkers have been in this business for over 10 years (indeed, about one third have been hawkers at least 20 years).

This long incumbency, frequently combined with the slow growth of sales, suggests that exit to better occupations is not easy and that the demand for credit will not be dynamic, once a hawker is in a steady-state (Schultzian) situation. Table 4.3 shows a greater influence of formal and semiformal loans for enterprises between 3 and 10 years old, which may still be expanding, and among the oldest. That is, hawkers with activities of 3 to 10 years old and relied comparatively less on commercial sources and more on institutional sources of credit.

The greatest incidence of non-borrowers is among enterprises of one to less than three years old. These figures confirm the complex relationship that may exist between the age of business and access to credit.

An important feature shown in Table 4.3 is that location of the hawking enterprise is a key attribute. Thus, more than 90 percent of the hawkers have been operating at the same place ever since they started their business. Location is an intangible asset for these hawkers, with an apparent positive relationship between time spent at one location and reputation, the accumulation of social capital and/or customer loyalty. The stock of social capital clearly increases with the age of business. Potentially, these effects may be stronger in the earlier stages of the business, with diminishing returns showing up over time.
As no specific slots are allotted to these enterprises by any authority, informal forces seem to be at work in the determination and protection of these prime hawking locations. Location influences access to credit, both as a signal of stability and because sufficient working capital may be necessary to sustain the business volume at a given location.

<table>
<thead>
<tr>
<th>Monthly income categories (in Rupees)</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ≤ y &lt; 500</td>
<td>3</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>500 ≤ y &lt; 1000</td>
<td>9</td>
<td>3.0</td>
<td>4.0</td>
</tr>
<tr>
<td>1000 ≤ y &lt; 2000</td>
<td>59</td>
<td>19.7</td>
<td>23.7</td>
</tr>
<tr>
<td>2000 ≤ y &lt; 3000</td>
<td>79</td>
<td>26.3</td>
<td>50.0</td>
</tr>
<tr>
<td>3000 ≤ y &lt; 4000</td>
<td>53</td>
<td>17.7</td>
<td>67.7</td>
</tr>
<tr>
<td>4000 ≤ y &lt; 5000</td>
<td>38</td>
<td>12.7</td>
<td>80.3</td>
</tr>
<tr>
<td>5000 ≤ y &lt; 10000</td>
<td>50</td>
<td>16.7</td>
<td>97.0</td>
</tr>
<tr>
<td>10000 ≤ y</td>
<td>9</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

y = gross monthly income
1 US dollar = 46.30 Rupees (Source: The Reserve Bank of India)

**Table 4.4: Frequency distribution of gross monthly income from hawking**

Table 4.4 describes the frequency distribution of the monthly incomes of hawkers in Mumbai, based on the long interviews with 300 hawkers. The largest majority (80 percent) of the hawkers have gross earnings below Rs. 5000 per month (which is just over US$ 100). The national minimum wage for India is Rs. 47.5 per day (Ministry of Labour, 2001). Given this minimum, 11 percent of the hawkers are earning less than the national minimum wage of about US$ 1 a day. Almost 50 percent of the hawkers make less than $2 a day (that is, half of the hawkers earn less than Rs. 3,000 per month).
While it is impossible to assess how poor they are, as other sources of household income are not known, it seems that most hawkers are not among the poorest of the poor of the urban population.

<table>
<thead>
<tr>
<th>Type of product sold</th>
<th>Percentage of hawkers selling this product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and vegetable</td>
<td>33</td>
</tr>
<tr>
<td>Non perishable food</td>
<td>18</td>
</tr>
<tr>
<td>Garments</td>
<td>16</td>
</tr>
<tr>
<td>Electronic items</td>
<td>3</td>
</tr>
<tr>
<td>Stationery</td>
<td>1</td>
</tr>
<tr>
<td>Accessories (purses, bags, belts, and the like)</td>
<td>12</td>
</tr>
<tr>
<td>Kitchen related items</td>
<td>6</td>
</tr>
<tr>
<td>Flowers</td>
<td>3</td>
</tr>
<tr>
<td>Shoes</td>
<td>3</td>
</tr>
<tr>
<td>Other (religious products, handicraft)</td>
<td>5</td>
</tr>
</tbody>
</table>

Total number of observations = 364

Table 4.5: Types of products sold by hawkers

Hawkers sell a variety of products, grouped here into 10 categories. Table 4.5 shows the type of products sold. More than 50 percent of them sell food products, both perishables and processed food. In fact, in Mumbai hawkers are the only source of fresh fruit and vegetable outlets at the retail level. Other leading products include garments and accessories, which primarily consist of purses and bags. hawkers also sell flowers, shoes, kitchen related items like utensils and containers, stationery and other items like incense sticks, pictures of gods, and handicraft. It is the variety of products sold by hawkers at cheap prices that makes them popular with urban consumers.
Associated with each category there is a level of competition, potential mark ups, channels of distribution, and a market structure where their suppliers operate. The type of good may also be related to the hawker’s risk (such as in the case of perishables), the amount of working capital required, and the practice of input suppliers to offer goods on credit at the wholesale level. These features should influence the sources of credit used.

4.4 Lending Technologies of Formal, Semiformal and Informal Lenders in Mumbai

There are various types of lenders in Mumbai, which can be broadly placed along the continuum of informal to formal lending technologies. Formal lenders include commercial banks (both from the public and private sector and a few foreign banks), and non-bank financial intermediaries, such as the Unit Trust of India and the Life Insurance Corporation (LIC). Other formal lenders in Mumbai include specialized financial institutions, such as the Small Industries Development Bank of India (SIDBI) and the Export-Import Bank of India, and non-bank financial companies, which have functions similar to banks, but cannot accept demand deposits.

Semiformal lenders include the cooperative banks and some non-government organizations, such as community welfare societies with financial functions. Informal lenders include moneylenders, pawnbrokers, commercial lenders such as wholesalers and itinerant traders, and indigenous bankers, who are private firms or individuals that operate as financial intermediaries and as such both receive deposits and offer loans (Gupta, 2001). This is the apparent continuum of prevailing lending practices in Mumbai.
This section describes the lending technologies used by various types of lenders in Mumbai. The compilation is a result of personal interviews with bank officers, commercial lenders, and moneylenders. The lending technologies described are representative of these broad types of lenders. These lenders were selected from the hawkers’ description of their sources of credit. Thus, lenders that do not provide credit to hawkers were not included. Several of the lending technologies available in the international continuum of microfinance best practices are not prevalent in Mumbai.

Formal lenders in Mumbai require standardized information to screen applicants, including documentation in the form of salary/income slips, verification of liquid and fixed assets (including title), and documentation providing proof of residence, photo, and ration card/passport. Borrowers may be asked to provide one or more guarantors not related to the applicant.

There are no credit rating agencies to screen these kinds of applicants in Mumbai. Credit ratings are available only for big corporations. Some commercial banks apply scoring charts as an alternative to reports from credit rating agencies. The scoring chart includes information on the age of the borrower, educational qualifications, occupation, number of years in the current occupation, and assets owned. The total loan to total annual income ratio is computed. Depending on the score obtained by an applicant, the bank manager decides whether to approve a loan or not and, if approved, authorizes the size of the loan.

The screening and monitoring of borrowers by formal financial institutions is mainly carried out through personal visits by a bank officer either at the home or at the place of work of the applicant.
There is a pre-inspection, in order to collect more information about the applicant, and/or a post inspection, in order to verify the end use of the funds. For a business loan, the visit by the loan officer is used to check whether the business is small or large and whether receipts of transactions are kept and accounts are maintained.

In many cases, for small loans worth less than Rs. 50,000, no collateral in terms of immobile property (such as real estate) is required. However, immobile property as collateral is a requisite for loans above Rs. 50,000. For personal loans, if installments are paid regularly, no formal documents are checked after the loan has been approved and disbursed.

Court procedures are used for contract enforcement. For late repayments, the borrower is first reminded with a phone call. If this does not work, a reminder notice is sent. If that fails, the borrower is visited by an officer. The officer tries to convince her to repay but he also tries to take into account the borrower’s constraints and gives her more time for repayment. If the loan is still not recovered, the borrower is sent a bank notice, followed by a legal notice. With no recovery, a legal suit is filed. Only the individual borrower and guarantors are responsible for repayment. There is no specific time within which delinquent loans are fully repaid.

Most commercial banks do not lend to hawkers, as they cannot provide the income tax return card, income or salary certificate, and collateral. Additionally, hawkers do not have any permanent place of business. One of the commercial bank branch managers claimed that he had granted loans to hawkers in Chennai (formerly, Madras). He felt that hawkers were similar to other typical clients in their behavior.
The age of business did not matter much but, for hawkers with longer experience, the loans were approved more quickly. The bank officer just visits the business location to verify the site. This manager also claimed that, according to government regulations, for business loans up to Rs. 25,000, no documents except a rent receipt are required. Hawkers, however, do not typically pay rent.

Semiformal lenders primarily include cooperative banks. Most of the hawkers interviewed were not aware of other semiformal lenders, such as non-government or microfinance organizations that operate in similar environments. The apparent absence of this type of lenders was quite surprising.

In order to obtain a loan from a cooperative bank, the applicant has to be a member and shareholder of the cooperative society, with shares worth some predefined percentage of the total loan amount. If, at the time of loan application, the borrower does not have the mandatory amount of shares, he is issued the remaining shares and is then provided with the loan. Some cooperative societies also require some portion of the loan amount to be kept as a fixed deposit. Some percentage of the loan amount is to be kept with the organization as a building fund. The borrower has to submit an application form, ration card, income certificate, photo and rent receipt or title for house/residence. Additionally, two guarantors (who are also shareholders of the same cooperative) are required.

The cooperative banks mainly approve group loans. The group is self-selected and the members cannot be part of the same household; although they can be related. No other collateral is required. All members have to be present at the time of loan disbursement but no meetings are held. They are jointly liable for each other’s loans.
In some cooperative banks, once a loan is approved, the first member gets the loan. After he repays the first three installments, the second member gets the loan, and after the second member pays the first three installments, the last member gets his loan.

In some cooperative societies, the borrower and two guarantors (who are also shareholders) form a group. Only one person in the group gets a loan, while the other group members just serve as guarantors.

Some of these credit societies offer large personal loans. For loans that are larger than Rs. 20,000, some kind of security is required. At least 80 percent of the loan amount has to be secured. The acceptable collateral includes gold, certificates of deposit, real estate, computers, and vehicles.

Like commercial banks, cooperative banks follow legal procedures for contract enforcement. In case of default, the borrower is sent a notice; if that does not work, an officer visits him. If the default persists, the borrower is taken to court. The cost of the recovery officer’s visit is charged to the borrower’s account. The amount charged is usually Rs 100; of which Rs. 40 go to the recovery officer and Rs. 60 go to the cooperative society.

All cooperative banks employ daily collection agents. Their job is to collect deposits and to work as recovery officers, whenever needed. The daily collection agents walk from street to street or house to house to collect deposits from various clients. They visit their clients every day. Every morning, they submit the amounts collected the previous day and then start collection for that day. Important requirements in the recruitment of collection officers are honesty, good communication skills, and contacts.
The daily collectors receive 3 percent of the monthly deposits they generate as their salary, but 10 percent of this amount is kept by the cooperative for security. There are no minimum or maximum collection requirements.

Cooperatives are important for hawkers in offering deposit services. They provide hawkers with a secure place to save. Deposits with cooperatives are rewarded with a five percent rate of interest per year. Some cooperatives offer hawkers loans worth 80 percent of their own deposits, at 15 percent annual rate of interest. The loan matures in a year. The majority of the cooperative banks do not have any specific rules for lending to hawkers.

With such lending technologies, not only hawkers with limited endowments are constrained in terms of their access to credit, but also those who can access these lenders pay extremely high implicit interest rates. Innovations in lending technologies that will reduce screening and monitoring costs will be useful for additional matching of borrowers and lenders at reasonable contract terms.

In the informal sector, moneylenders and suppliers of merchandise follow a lending technology that is based on trust and that is very personal. Loan contracts and sales on credit are informal arrangements. The contacts about moneylenders and commercial lenders were obtained from hawkers. The commercial lenders or moneylenders interviewed primarily had hawkers as their main clients.

Most moneylenders do not have an office but operate from home. They visit their clients personally and in some cases they employ agents, who would then visit the clients for daily collection. A government license is required for money lending but not all moneylenders possess such licenses.
According to these regulations, balance sheets have to be maintained and there are regulated ceilings on interest rates. Moneylenders mainly attract their clients through word of mouth and agent visits.

Before granting him a loan, the borrower’s behavior is observed for 15 days. The moneylender himself visits the potential borrower and collects information about him and may even contact neighboring hawkers. The moneylender checks how the potential borrower runs his business and whether he has a stable place of work. No documents are needed. In most cases, for the first loan, the applicant has to offer a guarantor. Once the loan is repaid and the lender-borrower contact is established, there is no longer any need of a guarantor. The moneylender visits the borrowers at random, although his agents visit the clients for daily collections. The moneylender gives time to delinquent borrowers and if they do not repay, he just keeps visiting them. The screening, monitoring, and contract enforcement strategies vary from moneylender to moneylender.

Commercial lenders (suppliers) are the most important and frequent source of credit for hawking enterprises. There are four types of suppliers relevant for hawkers: producers, wholesalers, itinerant traders, and businesses. Producers are either farmers, in the case of fruit and vegetables, or manufacturers, in the case, of goods such as readymade garments and utensils.

The set of wholesalers usually includes those who sell on large scale in specific markets, exclusively for the product they specialize in. In most cases, wholesalers have small stalls in these specialized markets. Itinerant traders roam around the streets selling goods to hawkers. They may either produce those goods themselves or may buy them from producers and/or wholesalers.
The last category of suppliers includes businesses, such as shopkeepers that are located close to the hawker. For example, a hawker selling kitchenware may buy his stock from a neighboring shop that specializes in such goods.

The borrowing hawker takes merchandise on credit from these commercial suppliers. Borrowers who have been in a business relationship with the supplier for some time and those who are new but can initially provide a guarantor usually get goods on credit. In some cases, the manufacturer/supplier would first supply goods to the hawker for free. This is the initial investment that the supplier makes to ensure that the hawker is bound to him. After some of this initial allotment of goods is sold, the hawker goes to the manufacturer/supplier and buys additional goods on credit. At this point, the hawker enters into the borrowing relationship with the supplier, and he starts to repay some amount every day. This procedure guarantees the factory owner/wholesaler of a retail outlet. Additionally, the hawker who takes goods on credit from this supplier is typically obliged to borrow only from this supplier. The hawker who takes goods on credit from others may have to return some of the initial allotment to the first supplier. This is not the case for those in an exclusive relationship. Thus, a hawker who gained access to loans may be able to choose and diversify his sources of goods.

In some other cases, the wholesaler may provide goods to the hawkers on a day-to-day basis. In such cases, there is no requirement of an exclusive relationship. As long as the wholesaler trusts and knows the hawker, the wholesaler offers goods on credit. The location and age of the hawker’s business matter. The supplier usually gives credit to those he has known for many years.
Some of the suppliers were hawkers before they established a formal enterprise and thereby know hawkers close to their area of influence. Some suppliers are shopkeepers and thus know the hawkers, due to their daily transactions with them. The hawkers who take credit from commercial lenders are trustworthy, have been in this business for some time, and are good businessmen.

The suppliers typically sell goods at the market price to the hawkers and in most cases do not charge interest. However, a few hawkers claimed that they pay higher prices for the goods they buy on credit. All hawkers may be paying higher prices, however, precisely because all have credit. The supplier may not have incentives to favor cash borrowers because he wants to keep the hawker linked to him. In some cases, the hawkers repay when they go to buy their next allotments of goods. Otherwise, the hawker can repay per day on a flexible basis, depending on his business sales. The borrowing hawker or the supplier may possess a diary in which all the credit account information is recorded.

For late repayment or defaulters, the supplier just continues to visit and ask the hawkers to repay. In many cases, it is difficult to enforce the contract, as the supplier may himself be facing the same difficulties that the hawkers face, due to systemic shocks such as municipal corporation raids (implemented to eradicate street hawking or enforce hawking zones). Many suppliers do not offer additional credit if earlier dues are not cleared, which is a strong incentive to repay. The hawkers need the suppliers as much as the suppliers need them.
4.5 Borrowers and Non-borrowers

Of the 364 hawkers interviewed, 82 percent took loans/goods on credit at least from one type of source: informal, semiformal or formal lenders, during the five-year period starting in June 1999 and ending in May 2004. Access to institutional credit is, however, very limited. Amongst those who received credit, two percent of the hawkers had access to commercial bank loans, while 10 percent of them had taken loans from the semiformal sector, primarily the cooperative banks.

Nearly 81 percent of the borrowers obtained credit from moneylenders and commercial lenders, comprising wholesalers, itinerant traders, producers, and businesses. Furthermore, during the same period, 48 percent of the hawkers received loans from friends and/or relatives.

By far, commercial lenders are the most important source of credit for hawkers. These statistics are an indication of their limited access to credit and other financial services from institutional sources. The sample statistics suggest that most of them take credit for the management of their hawking activity. Access to informal credit may release the hawker’s own purchasing power for other uses; however, hawkers with limited endowments of assets will be liquidity constrained. Table 4.6 describes access to various sources of credit by hawkers.

Only a few of the hawkers get loans from more than one type of source. In the five-year period, only 13 percent of the borrowers obtained credit from multiple sources. Additionally, within a given type of source, borrowers may have taken loans from more than one lender.
Those borrowers with access to institutional loans usually also use commercial credit. Of those who obtained formal sector loans, 71 percent got credit from the informal sector as well. Among the hawkers who borrowed from semiformal lenders, 89 percent also took credit from informal lenders. Only one hawker obtained loans from all three types of lenders. That almost all hawking enterprises depend on the informal sector for credit may be attributed to the nature of the hawking activity and to their limited access to other types of lenders.

<table>
<thead>
<tr>
<th>Type/s of borrowers</th>
<th>Number of hawkers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only formal borrowers</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Formal and semiformal borrowers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Formal and informal borrowers</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Formal, semiformal and informal borrowers</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Total Formal borrowers</td>
<td>7</td>
<td>1.9</td>
</tr>
<tr>
<td>Only semiformal borrowers</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Semiformal and informal borrowers</td>
<td>33</td>
<td>9.1</td>
</tr>
<tr>
<td>Total Semiformal borrowers</td>
<td>37</td>
<td>10.2</td>
</tr>
<tr>
<td>Only informal borrowers</td>
<td>256</td>
<td>70.3</td>
</tr>
<tr>
<td>Non-borrowers</td>
<td>64</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Total number of observations = 364

**Table 4.6: Classification of hawkers according to access to lender type**

The borrowers are subdivided into formal, semiformal and informal borrowers according to their most formal source among those used, as explained in chapter two. Figure 4.1 shows the distribution of borrowers and non-borrowers.
It is important to note that there were only seven observations in the category of formal borrowers, as compared to the category of semiformal borrowers (37), informal borrowers (256) and non-borrowers (64) as shown in table 4.7. These are mutually exclusive categories, based on the assumption that a borrower who obtains loans from a more formal category can also obtain loans from the less formal categories, if so required and many have done so. Table 4.7 also provides comparative statistics on selected variables, for the various types of borrowers and non-borrowers.
<table>
<thead>
<tr>
<th></th>
<th>Formal borrowers</th>
<th>Semiformal borrowers</th>
<th>Informal borrowers</th>
<th>Non-borrowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
<td>7</td>
<td>37</td>
<td>256</td>
<td>64</td>
</tr>
<tr>
<td>Age of hawker (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>40.9 (13.1)</td>
<td>38.9 (11.3)</td>
<td>36.04 (11.5)</td>
<td>34.3 (11.0)</td>
</tr>
<tr>
<td>Median</td>
<td>40</td>
<td>40</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Age of business (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>13.6 (10.2)</td>
<td>17.3 (10.4)</td>
<td>16.6 (10.3)</td>
<td>14.1 (9.9)</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>18</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Education (years of schooling completed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>8.1 (4.0)</td>
<td>7.6 (4.0)</td>
<td>7.1 (4.0)</td>
<td>9.1 (2.9)</td>
</tr>
<tr>
<td>Median</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Household size (in Mumbai)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.9 (1.2)</td>
<td>5.4 (2.8)</td>
<td>4.7 (1.1)</td>
<td>3.9 (2.8)</td>
</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Household earners (in Mumbai)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.0 (1.2)</td>
<td>1.7 (1.1)</td>
<td>1.9 (1.2)</td>
<td>1.6 (1.0)</td>
</tr>
<tr>
<td>Median</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Migrated hawkers (%)</td>
<td>43</td>
<td>59</td>
<td>68</td>
<td>67</td>
</tr>
<tr>
<td>Estimate of weekly sales (in Rupees)</td>
<td>6,221 (5,128)</td>
<td>7,270 (8,263)</td>
<td>5,220 (4,918)</td>
<td>NA</td>
</tr>
<tr>
<td>Median</td>
<td>5,000</td>
<td>5,500</td>
<td>3,500</td>
<td></td>
</tr>
<tr>
<td>Estimate of monthly income (in Rupees)</td>
<td>4,929 (3,168)</td>
<td>4,532 (2,638)</td>
<td>3,962 (2,815)</td>
<td>NA</td>
</tr>
<tr>
<td>Median</td>
<td>5,000</td>
<td>4,000</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>Hawking at the same place ever since started (%)</td>
<td>100</td>
<td>92</td>
<td>88</td>
<td>84</td>
</tr>
<tr>
<td>Possession of government issued ID card</td>
<td>100</td>
<td>95</td>
<td>79</td>
<td>69</td>
</tr>
<tr>
<td>Social capital</td>
<td>57</td>
<td>73</td>
<td>46</td>
<td>NA</td>
</tr>
<tr>
<td>Union members</td>
<td>57</td>
<td>34</td>
<td>41</td>
<td>NA</td>
</tr>
</tbody>
</table>

Standard deviations in parenthesis
For pair wise t statistics on borrowers and non-borrowers see the appendix to this chapter

Table 4.7: Characteristics of borrowers and non-borrowers by different sources

Borrowers are consistently older than non-borrowers. However, the age of borrowers is significantly different (at the 5 percent level) only for the categories of semiformal borrowers and non-borrowers, without controlling for other variables.
Access to institutional loans requires assets and reputations that are accumulated over time. A demand for these loans may depend, however, on opportunities to expand the business.

The age of business is the highest for borrowers from semiformal sources, followed by those with access only to informal sources, non-borrowers, and borrowers from formal sources. The age of business is, however, significantly different (at the 10 percent level) only for the categories of informal borrowers and non-borrowers. This implies that, in order to be at least an informal borrower, the hawker must have been in business for some time.

Based on pair-wise comparisons, education is significantly different (at the 5 percent level) for semiformal borrowers and non-borrowers. For the categories of informal borrowers and non-borrowers, education is also significantly different (this time, at the 1 percent level). The higher mean and median level of education for non-borrowers might be attributed to their lower average ages.

Household size is smaller for non-borrowers as compared to borrowers; this may be attributed in part to the fact that these enterprises belong to migrants residing by themselves in Mumbai. Household size is a significantly different (at the 5 percent level) for the categories of semiformal and non-borrowers. Household size is significantly different at the 1 percent level for the categories of informal and non-borrowers and of semiformal and informal borrowers. Thus, it appears that a larger household size may allow the hawker more access to credit.
More importantly, on average the household of formal borrowers has more income earners, when compared to households in all other categories. This variable is significantly different (at the 5 percent level) only for the categories of informal borrowers and non-borrowers. A larger number of income earners increases income flows and diversifies the sources of income, thereby increasing creditworthiness.

The data are not available for non-borrowers with respect to weekly sales and monthly income. Average weekly sales are highest for semiformal borrowers, followed by formal and informal borrowers, respectively, and differences in sales are significant (at 5 percent level) only for the categories of semiformal and informal borrowers. The average monthly income is the highest for formal borrowers, followed by the semiformal and informal borrowers. Differences are not significant for any of the categories.

Possession of a license to hawk or identification document and membership in a hawking union or in any other organization (used as a proxy for social capital) can be valuable in signaling formality of the enterprise to various types of lenders. This may increase access to more formal types of lenders. This claim can be supported by the fact that formal and semiformal borrowers consistently possess licenses, identification documents, union memberships and/or other social capital more frequently, as compared to informal borrowers. No data are available on social capital for non-borrowers, but 69 percent of them possess identification documents. However, this proportion is higher for formal (100 percent) and semiformal (79 percent) borrowers.

Along with documentation, the location of the hawking enterprise is an attribute that may be valuable for borrowers who want to access loans from various types of lenders. A permanent location of the business is vital in the accumulation of reputation
and social capital. It may also be valuable in the creation of a loyal customer base. Most kinds of lenders may not be willing to offer financial services to hawkers who are mobile, as the monitoring of such clientele becomes difficult. Mobility might also reflect negatively on the entrepreneurial skills of hawkers, unless it reveals upward mobility. One would thus expect a positive relationship between the time spent in hawking at the same location and access to various types of lenders along the continuum. As expected, more formal types of borrowers are also those who have a more permanent location.

Not all hawkers applied for loans and, among those who applied, not all got them. It is possible to report the acceptance rates (for June 2003 – May 2004) in each sector, by examining the data on how many hawkers applied for credit from each type of lender and how many of them received the loans.

For the sample of 300 hawkers, the acceptance rate for the formal sector is 64 percent, while for the semiformal sector it is 100 percent. All those who applied for loans from moneylenders also received loans and the acceptance rate for commercial lenders (suppliers) is close to 100 percent as well.

In the five-year period, of the 364 hawkers, 19 percent did not borrow from informal lenders, while 88 percent did not borrow from institutional lenders. Those who did not borrow at all or did not borrow from a particular source were further asked about the reasons for not applying for credit from institutional and/or informal sources. Table 4.8 is a compilation of these reasons. Most of the hawkers who did not apply for loans from a particular type of lender claimed to have no need for additional loans. This may be either because they are receiving credit from another source or because they are not liquidity constrained.
<table>
<thead>
<tr>
<th>Reason for not taking credit from:</th>
<th>Informal lenders</th>
<th>Institutional lenders</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No need</td>
<td>32</td>
<td>152</td>
<td>184</td>
</tr>
<tr>
<td>Lenders do not give credit to hawkers</td>
<td>25</td>
<td>32</td>
<td>57</td>
</tr>
<tr>
<td>No collateral/guarantor</td>
<td>4</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>It is risky</td>
<td>7</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>Requires a lot of documents</td>
<td>0</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Do not generate enough income to repay</td>
<td>5</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td>Lack necessary documents</td>
<td>0</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>High rate of interest</td>
<td>2</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Do not like loans</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>No knowledge of this type of lenders</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Bad experience with previous loans</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table: 4.8: Reasons for not applying for loans from informal and institutional sources**

Some hawkers did not apply for loans as they preemptively assumed that they would not receive loans, even if they applied. This was the case even for informal sources, which suggests a possible weakness in their creditworthiness. These people considered themselves out of the credit market _a priori_. An additional category of hawkers did not apply for loans because they considered that being in debt is risky, while others claimed that they might not be able to generate enough income to repay.

One important reason for not applying from institutional sources is the requirement of extensive documentation as is the requirement of collateral and/or guarantors. Some of the hawkers in fact claimed that they did not apply because they lacked the necessary documents. This reflects the high transaction costs associated with institutional credit and was not so frequently the case for informal sources.
Figure 4.2: Credit rationing according to the proposed categories
It is interesting to note that the level of interest rates is not perceived as an important barrier. Indeed, for very small loans, the non-interest transaction costs of the borrower matter more than interest payments in determining the total cost of the funds (Gonzalez-Vega, 1976). The discussion about credit rationing is relevant here. Section 2.3 described the credit rationing framework pertinent to this dissertation. The classification proposed there is applied here to outcomes from the applications by hawkers for loans from formal, semiformal, and informal lenders. The results are shown in Figure 4.2.

The classification assumes that those who receive loans from more formal lenders can also receive credit from less formal lenders. Based on the survey, there are 7 borrowers with access up to formal sources, singly or in combination with semiformal and informal loans, 37 borrowers with access up to semiformal sources, singly or in combination with informal loans, and 256 borrowers with access only up to informal sources.

Only one type of explicit rationing is observed in the sample of hawkers in Mumbai: rationing in the formal sector. Four hawkers who applied for loans from commercial banks were rejected. These four hawkers then applied for and received credit from the informal sector and are classified as informal borrowers rationed in the formal sector. No other type of rationing is observed, which may be attributed to the fact that many hawkers either do not apply for institutional credit by pessimistically assuming that they would be rejected, or receive the loans when they apply.
This categorization is also useful in describing non-borrowers. Non-borrowers include those hawkers who never applied, either because they were not interested or not constrained, perceived borrowing as risky, anticipated high transaction costs of borrowing, or preemptively assumed that they would not receive credit. This category also includes those who applied and did not receive loans from any type of lender. In the survey, there are 64 non-borrowers.

4.6 Features of the Loan Contract

Of the hawkers who had taken credit in the five years beginning in June 1999, at least once, 97 percent received loans in the year from June 2003 to May 2004, the year for which detailed information on credit transactions was recorded. This section describes in greater details features of these contracts. Among those who obtained credit in this year, less than one percent received loans from formal sector institutions, eight percent obtained loans from semiformal sector lenders, and 98 percent had access to credit from informal lenders. Within the informal sector, four percent of these hawkers obtained loans from moneylenders. For the same period, eight percent of the borrowers had access to credit from multiple types of lenders.

Among those who received goods on credit from commercial suppliers, 80 percent of the hawkers obtained it from wholesalers, 4 percent from producers, 3 percent from businesses, and 9 percent from itinerant traders. Only four percent of these hawkers took goods on credit from more than one type of supplier.
Table 4.9: Average contract terms for various types of lenders

<table>
<thead>
<tr>
<th>Loan contract</th>
<th>Formal lenders</th>
<th>Semiformal lenders</th>
<th>Informal lenders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moneylenders</td>
</tr>
<tr>
<td>Loan size (in rupees)</td>
<td>35,000</td>
<td>35,233</td>
<td>9,395</td>
</tr>
<tr>
<td>Term to maturity</td>
<td>28 months</td>
<td>23 months</td>
<td>5 months</td>
</tr>
<tr>
<td>Annual interest rate (%)</td>
<td>12</td>
<td>23</td>
<td>87</td>
</tr>
</tbody>
</table>

Close to 58 percent of the hawkers held a bank account in a formal financial institution, but very few got loans there. These statistics indicate that there is still limited access to financial services for hawkers and that their main sources of credit are informal lenders, mostly commercial suppliers. Table 4.9 reports descriptive statistics on the loan contracts from the three types of lenders.

The average size for loans from the formal sector was Rs. 35,000. Semiformal sector loan sizes are comparable to those in the formal sector, with an average of Rs. 35,233. Loans from the informal sector were smaller, in amounts of Rs. 4,022 from commercial lenders and Rs. 9,395 from moneylenders. All loans from commercial lenders were in kind. To estimate loan size, hawkers were asked to report the value of the goods, held at the time of the interview that had been taken on credit.

For loans from moneylenders, commercial banks, and semiformal institutions, the reported planned uses are business-related spending (57 percent), house related expenses, such as buying or repairing a house and buying household goods (17 percent), and expenditures on social events, such as a wedding (17 percent).
For the loans obtained from commercial banks, the average term to maturity was 28 months, with an annual average rate of interest close to 12 percent. This suggests some investment purpose. The annual interest rate charged by semiformal institutions ranged from 10 to 60 percent, with the average term to maturity around 26 months. Again, this suggests investment funding. For moneylenders, the rates of interest ranged from 5 percent per month to 15 percent per month. The term to maturity varied from a month to a year. The institutional lenders invariably offered better terms of their contracts, with larger loan sizes, lower interest rates, and longer terms to maturity.

Goods on credit from commercial suppliers were taken on a continuous cycle. Most hawkers had goods taken on credit and they would either repay in one or more installments. In most cases, informal sector credit had flexible terms to maturity, as repayment was contingent on the ability of the borrower to sell and repay. In many cases, municipal raids affected their ability to repay.

Transactions with commercial suppliers are mostly interest free. Around nine percent of the borrowers claimed to have paid prices higher than those prevailing in the market for the goods they bought on credit. The implicit rate of interest could not be estimated. Only one percent reported that they paid explicit interest to commercial lenders. The average term to maturity for credit from commercial lenders was much shorter, at 14 days.

Hawkers need short-term credit to meet the working capital requirements of their businesses. While informal lenders are valuable for hawkers for their working capital requirements, they do not offer as wide a range of financial services as formal and semiformal institutions.
The limited access to institutional credit is mainly due to lack of collateralizable assets, permanent location of the business, and limitations of the lending technologies to design contracts specifically suitable for hawkers. The challenge lies in identifying areas in which innovations in lending technology will lead to additional matching of hawkers with a wider range of lenders along the continuum.

4.7 Borrower Transaction Costs

Some of the transaction costs of borrowing from various types of lenders can be estimated. These costs can be approximated from data on the distance traveled and time spent to reach the lender and by looking at costs of transportation. Transaction costs are an important component of the borrowers’ total cost of borrowing.

From the survey data, it can be estimated that the hawkers take approximately 14 minutes to reach the institutional lenders (formal and semiformal) and travel around two kilometers to get there. The average cost of transportation is Rs. 2. Compared to the situation in rural areas, this is not excessive.

Given the nature of hawking, however, office hours may be a problem. Semiformal lenders predominantly include cooperative banks, which employ daily collection agents. In the case of commercial banks, these costs are low because hawkers mainly apply to those banks that are close to their place of work. High transaction costs would emerge in dealing with these institutions, however, because of the documentation required and other red tape. Within the informal sector, the costs of traveling to the moneylender’s place are less than one Rupee. The distance is less than a kilometer and travel time is four minutes. Transaction costs are thus low for loans from moneylenders, because either the moneylenders or their agents visit their clients.
With respect to commercial suppliers, the travel time is close to 28 minutes, with an average distance of 8 kilometers, and a cost of transportation at Rs. 9. It takes a longer time to travel to the place where suppliers operate, as there are specialized wholesale markets for various products in Mumbai. Most of the hawkers visit the wholesale markets of the particular product they sell, irrespective of whether they buy on credit or not, so the higher transaction costs reported here may be overestimated.

Another component of transaction costs is related to the number of trips needed to get information about the loan, submit a loan application, receive the funds, and the like until the loan is repaid. Transaction costs also emerge from the waiting time between the loan application and the actual receipt of the funds. For loans from institutional lenders, on average hawkers need to make three visits to the institution. It takes approximately 23 days from the application until disbursement. For loans from moneylenders, hawkers do not visit them, as the moneylender or his agents visit the hawkers. In the case of moneylenders, the waiting time between loan application and disbursement is shorter, at two days. In the case of commercial suppliers, hawkers do not have to give an advance notice to get the goods.

All institutional lenders require hawkers to provide a guarantor. In the case of informal lenders, there are no specific guarantor requirements. In the majority of cases, the informal sources lend only to hawkers they know. Once a borrower-lender relationship is established, there is usually no need of a guarantor.

Transaction costs are also incurred in making repayments. These costs are negligible or zero when the lender collects installments; however, they may be higher (in terms of time and cost of transportation) if the hawker has to travel.
For commercial banks, hawkers have to visit their offices to make repayments. In the case of hawkers who borrowed from the semiformal lenders, about 74 percent claimed that they did not have to visit the lender. This is because most semiformal lenders send their daily collection agents to collect.

Approximately 63 percent of the hawkers who borrowed from moneylenders stated that these lenders came to collect their dues. With regards to suppliers, approximately 34 percent of the hawkers claimed that the itinerant traders and some wholesalers visited them. Some wholesalers visit hawkers to collect dues and check how the hawker is running the business, whether he is at the same location, and the like. In case of other suppliers, hawkers visit them regularly when they buy their stock and start repaying in full or partial amounts every time they visit these suppliers.

Transaction costs are higher for commercial banks, as they require a long application procedure (asking for collateral, guarantor, and so on), and there is an extensive waiting time between the loan approval and the actual disbursement of the loan. The reason is that formal lenders have less personalized information about their clients and therefore have to rely on standardized information to grant a loan.

Semiformal lenders also have specific requirements. However, they impose smaller transaction costs on hawkers because they employ daily collection agents. In turn, these agents perform screening and monitoring functions for the institution and collect deposits. This is a valued service provided to hawkers, who need a secured place to keep their liquidity. Furthermore, as the agents visit the sites where the hawkers work, they get information on the borrower’s behavior. They can also collect information on hawkers by asking neighboring hawkers and/or shopkeepers.
This description suggests that borrowers who can meet the requirements of the formal lending technology are matched with commercial banks. The traditional commercial bank technology is so stringent for this segment of the population that there are extremely few matches. There is a comparatively higher number of matches with semiformal lenders. This is because these lenders have adopted some innovative lending technology components, which help acquire more information about non-traditional borrowers like hawkers.

The sample data indicate that most of the hawkers are still matched only with informal/commercial lenders. This is because their lending technology is based on trust, reputation in the market, and previous or existing business relationships. Most of the institutional lenders have not been able to serve non-traditional clientele like the hawkers. One possible explanation is that hawkers are pessimistic about their own ability to access credit and therefore do not apply. An alternative explanation of the limited access to institutional lenders is that there is credit rationing.

The next chapter tests empirically the determinants of the matching of hawkers with a particular type of lender. The outcomes of this exercise will help to investigate the potential for improvements in lending technologies, which can in turn lead to additional matches of hawkers with various types of lenders.
### APPENDIX TO CHAPTER 4

<table>
<thead>
<tr>
<th></th>
<th>Formal-semiformal borrowers</th>
<th>Formal-informal borrowers</th>
<th>Formal-non-borrowers</th>
<th>Semiformal-informal borrowers</th>
<th>Semiformal-non-borrowers</th>
<th>Informal-non-borrowers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of hawker</strong></td>
<td>0.41</td>
<td>1.09</td>
<td>1.49</td>
<td>1.41</td>
<td>2.03**</td>
<td>1.12</td>
</tr>
<tr>
<td><strong>Age of business</strong></td>
<td>-0.87</td>
<td>-0.76</td>
<td>-0.13</td>
<td>0.41</td>
<td>1.56</td>
<td>1.74*</td>
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<tr>
<td><strong>Level of education</strong></td>
<td>0.33</td>
<td>0.69</td>
<td>-0.77</td>
<td>0.71</td>
<td>-2.13**</td>
<td>-3.70***</td>
</tr>
<tr>
<td><strong>Household size (in Mumbai)</strong></td>
<td>-0.49</td>
<td>0.44</td>
<td>0.89</td>
<td>2.82***</td>
<td>2.56**</td>
<td>3.42***</td>
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<tr>
<td><strong>Household earners (in Mumbai)</strong></td>
<td>0.61</td>
<td>0.15</td>
<td>1.02</td>
<td>-0.95</td>
<td>0.66</td>
<td>2.08**</td>
</tr>
<tr>
<td><strong>Weekly sales (estimated in Rupees)</strong></td>
<td>-0.32</td>
<td>0.53</td>
<td>NA</td>
<td>2.14**</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Monthly income (estimated in Rupees)</strong></td>
<td>0.35</td>
<td>0.89</td>
<td>NA</td>
<td>1.16</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

***, **, * indicate significant at 0.01, 0.05 and 0.10 levels respectively.

Table 4.10: Estimated t-statistics for the categories of borrowers and non-borrowers
CHAPTER 5

EMPIRICAL RESULTS ON ACCESS TO CREDIT AND MATCHING

This chapter undertakes an empirical exploration of the determinants of the matching of various types of hawkers and various types of lenders in informal urban markets in Mumbai. The theoretical model of chapter three predicts that borrowers with greater endowments of documentation and other evidence of formality will match with lenders that use a lending technology that emphasizes standardized and documented information for screening and monitoring and that employs formal mechanisms for contract enforcement.

Information useful in the evaluation of creditworthiness by formal lenders gets accumulated as the hawking business becomes more formal. Thus, it is expected that hawkers with the characteristics of greater formality (such as the possession of a hawking license or ID document, participation in formal organizations, and ownership of fixed assets, such as a house) will match with formal lenders more frequently than informal businesses will match with them. For many informal businesses, which are constrained in their ability to signal their creditworthiness, there will be no matching at all and they will remain credit constrained.
In this dissertation, the term access to credit is used to designate the observation of a hawker who has had a loan in a specified time period. This observation is the outcome of both supply and demand forces.

Some hawkers may not need credit and do not demand a loan, while others may have a legitimate demand for credit but may not receive a loan, due to the information and incentive problems found in credit markets. All of these types of hawkers are classified as non-borrowers, irrespective of the reason for the absence of a loan. As access is a result of both supply and demand factors, there would be an identification problem in any attempt to estimate the demand for or the supply of credit. The objective of this dissertation is not, however, to estimate the demand or the supply of credit but rather to explain the observation of loan contracts (that is, access) or the lack of them, irrespective of the reasons.

In particular, the dissertation attempts to examine the matching patterns between types of borrowers and types of lenders. Both borrower and lender efforts contribute in overcoming the transaction costs that prevent loan contracts from emerging. From this perspective, the identification problem is not a major issue, and the econometric methods used here bypass the problem.

To examine issues related to access and matching, the estimation of three types of econometric models is implemented in this chapter. The models test hypotheses about access to credit and about the nature of the corresponding transactions in credit markets, as follows:
1) First, a probit model is used to examine access or the lack of access to credit by hawkers. This helps in identifying the characteristics of borrowers and non-borrowers.

2) Second, a Heckman selection model is used to estimate the amount of credit obtained by the borrowers, while accounting for the selection bias that may exist if the regressions are run only on the set of borrowers rather than on the whole sample of hawkers.

3) Last, an ordered logit model is estimated to determine the nature of the matching patterns between various types of borrowers and various types of lenders (formal, semiformal, and informal). More specifically, the ordered logit model tests the hypothesis that hawkers with more formality-related characteristics are matched with lenders along the higher end of the continuum of lending technologies.

5.1 Definitions of Explanatory Variables

This section defines and describes various explanatory variables that will be used in estimating the econometric models mentioned above. Some are related to characteristics of the hawker and others to features of the business, while characteristics related to formality are specifically highlighted. The relevant types of explanatory variables for the empirical analysis consist of:

(i) Socio-demographic features of the hawker: These variables provide information about the behavior of the borrower and about his ability to repay. They include the hawker’s level of education and religion, as well as the number of household members earning income.
(ii) Formality-related variables: These are proxies related to the information required for screening and monitoring, such as the possession of an ID document and license to hawk, membership in various formal or informal organizations, ownership of a house, and the type of account keeping methods.

(iii) Size and nature of the business: These are variables such as those associated with the experience in hawking, as captured through the age of the business. This set also includes variables capturing the mobility of the hawking enterprise, type of product sold, hours spent hawking per day, and the value of weekly sales.

The following paragraphs briefly describe these variables.

Socio-demographic features of the hawker

- **Religion:** Religion may be an important variable that affects the demand for credit. Here, it is a dummy variable with a value of zero for Muslims and a value of one for Hindus. Some religions discourage borrowing, due to prohibitions of usury. In fact, some hawkers following Islam claimed that they did not borrow due to their religious beliefs, while some claimed that they started borrowing only recently, due to the nature of the hawking activity, even though borrowing is against their religious beliefs. Religion may also influence the supply of credit, as some lenders may prefer to offer loans to people primarily from their own communities or castes.
• **Education**: Education is measured in terms of the years of schooling completed by the hawker. Education represents both the scope of the productive opportunities open to the hawker and his ability to deal with the formality of loan evaluation procedures.

• **Household earners**: The number of household earners living in Mumbai is a continuous variable, and it is an important indicator of the level and diversification of the sources of household income. Households with several income earners are better able to cope with risk and to generate larger and more flexible cash flows, and are thus more creditworthy.

*Features of the business*

• **Type of product**: This is a categorical variable with four categories, which capture the types of products sold by hawkers. Different types of products are associated with different cash flow requirements and different practices of suppliers, including their sales on credit. The first category includes non-perishable food items; the second category includes fruit, vegetables and flowers; the third category comprises electronic items, stationery, accessories such as belts and purses, and kitchen related items such as utensils. The last category consists of garments, shoes, religious items such as frames of gods, and handicraft items. Higher values for a category are associated on average with higher values of sales. Thus, hawkers selling products in category 4 are typically expected to generate a higher value of weekly sales than hawkers selling products in categories 1, 2 or 3, but there is much variability across hawkers.
• **Sales:** Sales is a continuous variable with weekly values in Rupees. The higher the value of sales, the higher the amount of liquidity that a hawker needs to maintain his inventory of goods. In turn, a high value of sales may be seen by lenders as a signal of entrepreneurial ability. To account for the endogeneity that may exist between access to credit and the amount of credit obtained, on the one hand, and the value of sales, on the other, this variable is estimated using a regression of weekly sales on the age of business, license, accounting practices, hours spent hawking, and type of product, as explanatory variables. The predicted value of sales is then used in the regressions. Possession of a license, accounting method, and type of product sold are significant variables that positively influence the value of weekly sales.

• **Hours hawking:** This is a continuous variable measuring the number of hours spent in hawking per day; it is expected to influence the amount of weekly sales positively.

• **Mobility:** It is a dummy variable with a value of one for those hawkers who never changed their location ever since they started their business and zero otherwise. The location of the business is an important attribute of informal hawking enterprises. A near permanent location of operation is a signal of survival, and it is helpful in building social networks and reputations in the market, which will be an important indicator of creditworthiness.

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8 Results from the regression are reported in the appendix to this chapter.
• **Age of business:** The number of years in the hawking business may be an important variable in showing creditworthiness to various types of lenders. This is because incumbency may help in accumulating reputation and collaterizable assets that may be important to lenders.

**Formality variables**

• **Accounting practices:** Formal accounting practices, such as keeping financial statements, are useful in showing the borrower’s creditworthiness to a formal lender. Hawkers do not maintain formal records of their transactions, however, given the small scale and informal nature of their enterprises. At most, they maintain their transaction records in a notebook. Accounting practices is a dummy variable with the value of one if the borrower uses an informal notebook to maintain the record of his business transactions; otherwise, it takes the value of zero.

• **Identification card:** Possession of legal and formal documentation is important in establishing a relationship with a semiformal or a formal lender, as this may be required for contract enforcement and other lending procedures. Identification documents, such as a government issued passport and a driving license, may be required for credit contracts. Identification card is a dummy variable with a value of one for those hawkers possessing ID documents and zero for those who do not have any.
- **License**: The municipal corporation in Mumbai used to issue licenses for hawking until two decades ago. Possession of a license is a dummy variable similar to identification card, which signals the stability of the hawker. It is a dummy variable with a value of zero for those who do not possess any license and a value of one for those who possess it.

- **Social capital**: Social capital refers here to a membership in any of various formal and/or informal organizations, such as a hawkers’ union, cooperative, or ROSCA. Such membership may be representative of the hawker’s social relationships and may signal his ability to fulfill obligations. Further, some such organizations may become sources of funds or of references. This is a continuous variable, with a value equal to the number of organizations to which the hawker belongs.

- **House**: Ownership of a house is treated as a proxy for the possession of collateralizable assets. It is a dummy variable with a value of one for those who own a house and a value of zero for those who do not own a house.

Information on social capital, ownership of a house, and value of weekly sales is available only for borrowers. Due to this data limitation, these variables are not included as regressors when the estimation is undertaken for all of the sampled hawkers.

### 5.2 Access to Credit by Hawkers

A binary probit model is used to estimate the probability of access to credit by hawkers. The results from this estimation will shed light on factors determining access to credit or their lack of it.
In a probit specification, the error term is assumed to be normally distributed with a cumulative distribution function (CDF) given by $\Phi\left(\sum_k \beta_k x_k\right)$, where the $x_i$ denote the explanatory variables and the $\beta_i$ denote the coefficients to be estimated.

Thus, the equation of the probability of being a borrower (access to the credit market) is

$$\text{Prob}(y = 1) = \Phi\left(\sum_k \beta_k x_k\right)$$

(1)

The equation for the probability of being a non-borrower (no access to the credit market) is

$$\text{Prob}(y = 0) = 1 - \Phi\left(\sum_k \beta_k x_k\right)$$

(2)

The dependent variable in the probit regression is one if the hawker had had access to the credit market; i.e., he had been a borrower at any time in the five-year period between June 1999 and May 2004. Otherwise, it is zero. Access to credit here implies the observation of loans from at least one of the formal, semiformal or informal sources.

A probit model is an appropriate choice here, as the information is available only on whether a credit transaction was observed or not, rather than on the amounts of credit received. The set of explanatory variables includes education, religion, household earners, license, ID document, accounting practices, mobility, age of business, and type of product.
The coefficient for the variable education is expected to have a positive sign, as more educated hawkers may be less risk averse in accessing credit markets and may also understand better the loan application procedures. Religious beliefs may influence the demand for credit. Thus, Muslim hawkers may be less likely to be borrowers. On the supply side, some lenders may prefer to lend to hawkers from their own castes and communities. Since these are mainly Hindu organizations, the coefficient for the variable religion is expected to have a positive sign. A hawker whose household has more earning members is more likely to be a borrower, as he is more creditworthy in terms of his ability to cope with risk and generate cash flows.

Variables capturing the possession of identification documents and a license to hawk are expected to generate positive signs, because they facilitate participation in contracts. The coefficient for the variable capturing the type of account keeping method is also expected to have a positive sign. Age of business is also expected to generate a positive coefficient sign, because hawkers with older businesses may have already established their creditworthiness, in reflection of entrepreneurial skills and ability to survive in the market. The coefficient for the variable mobility is expected to be positive, because a permanent business location is a signal of survival in the market. The variable type of product is expected to generate a positive sign.

The results from the estimation are presented in Table 5.1. The coefficients of discrete choice regressions are only useful for their sign and significance but not for their magnitude. In order to understand the impact of the explanatory variable on the dependent variable, it is necessary to calculate marginal effects. The relevant marginal effects are also reported in Table 5.1.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Median</th>
<th>Coefficient</th>
<th>Z-statistic for Coefficient</th>
<th>Marginal Effect</th>
<th>Z-statistic for Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>8</td>
<td>-0.0122</td>
<td>-0.56</td>
<td>-0.0031</td>
<td>-0.55</td>
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<tr>
<td>Religion</td>
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<td>-0.1282</td>
<td>-0.66</td>
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<tr>
<td>Household earners</td>
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<td>0.0378</td>
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</tr>
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<td>License</td>
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<td>-0.1594</td>
<td>-0.76</td>
<td>-0.0432</td>
<td>-0.73</td>
</tr>
<tr>
<td>Accounting practices</td>
<td>0</td>
<td>-0.0209</td>
<td>-0.10</td>
<td>-0.0053</td>
<td>-0.10</td>
</tr>
<tr>
<td>Identification card</td>
<td>1</td>
<td>0.2598</td>
<td>1.35</td>
<td>0.0734</td>
<td>1.28</td>
</tr>
<tr>
<td>Age of business (in months)</td>
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<td>0.0008</td>
<td>1.06</td>
<td>0.0002</td>
<td>1.03</td>
</tr>
<tr>
<td>Mobility</td>
<td>1</td>
<td>-0.1951</td>
<td>-0.69</td>
<td>-0.0445</td>
<td>-0.76</td>
</tr>
<tr>
<td>Type of product</td>
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<td>0.2294***</td>
<td>2.98</td>
<td>0.0578</td>
<td>3.00</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>1.2865***</td>
<td></td>
<td>2.89</td>
<td></td>
</tr>
</tbody>
</table>

Log likelihood = -158.89    Likelihood Ratio Test $\chi^2 (9) = 20.75$    Number of observations: 364

***, **, * indicate significant at 0.01, 0.05 and 0.10 levels respectively.

Table 5.1: Binary probit estimates for borrowers versus non-borrowers

Only the coefficients corresponding to the number of household members earning income and the type of goods sold are significant. The coefficient for the number of household earners has a positive sign, as expected. The marginal effect for this variable is significant at the 10-percent level. The probability of having been a borrower at least once in the past five years increases by four percentage points with an additional earning member in the household. This may reflect the ability to earn income through multiple sources, which may make the household less vulnerable to adverse shocks and may generate the patterns of cash flows needed for repayment.
The sign of the coefficient for type of good sold is also positive, as expected. For each category of higher-value product, the probability of having been a borrower increases by six percentage points. Intermediating higher-valued products requires more liquidity. Lenders may also be more willing to lend to such enterprises, as the larger investment in working capital required may reflect more successful entrepreneurship.

None of the other explanatory variables used in this specification is significant in explaining the access of hawkers to credit. As all types of access are considered jointly in this exercise, differences in education, degrees of formality, and age of the business may not matter as much as they may in explaining access to specific sources. Apparently, very few hawkers work without at least some access to supplier’s credit. Access may also be influenced by other variables, such as the accumulation of social capital and reputation, which unfortunately are not captured in the data set for non-borrowers. Therefore, these variables could not be included as regressors in the estimation. Some hawkers informally reported that they had to bribe agents of moneylenders or cooperatives to obtain loans; again, the ability and willingness to pay bribes are not captured in the data set.

5.3 Modeling the Amount of Credit Obtained: The Heckman Two-stage Approach

Section 5.2 described the factors that influenced the likelihood of having obtained at least one loan in the corresponding five-year period. The total amount of credit obtained is examined here as the summation of all loans obtained from formal, semiformal and informal lenders in the year from June 2003 to May 2004.
The total amounts borrowed are, therefore, observed only for borrowers; i.e., only for those hawkers who had any loans in the year of observation. If the regressions are run only for borrowers, there may be a selection bias problem.

A Heckman two-stage procedure is used in this section to account for the selection bias that may exist while estimating the equation to explain the total amount of credit received in the year. If only those who participated in credit markets are studied to understand the determinants of access to credit, the resulting estimates will be biased, as those who had access to credit may be systematically different from those who did not have loans.

These differences may reflect unobserved variables such as entrepreneurship, initiative, and persistence. Any estimate of the amount of credit obtained that does not account for this selection bias suffers from an omitted variable problem, namely, ignoring the impact of selection on the amount of the loan.

The Heckman procedure seeks to remedy for this bias, by estimating a measure of the odds of selection in the first step and then including this estimate in the amount of credit regression. The estimate of the omitted variable is called the inverse Mill’s ratio. The Heckman selection model provides consistent, asymptotically efficient estimates that correct for the selection bias that would result if regressions were run only on hawkers with credit and the likelihood of access to credit market was not random (Greene, 2000).

The Heckman procedure involves two stages. In the first stage, a probit model is estimated on the likelihood of access to credit with data from all borrowers and non-borrowers, for the year June 2003 to May 2004, and the inverse Mill’s ratio is calculated.
The second stage is then undertaken with the estimation of an OLS model on the amount of credit obtained by those hawkers with access to credit markets, while including the inverse Mill’s ratio to account for selection bias.

The dependent variable in the probit regression is the probability of access to credit during the year of observation. The set of independent variables includes religion, education, household earners, age of business, type of product, license, ID document, accounting practices, and mobility, as was specified in the probit model of the earlier section. The time period for the definition of access to credit differs, however.

The second stage is an ordinary least squares (OLS) regression that uses the estimated Mills ratio from the first stage to account for the selection bias in estimating the total amount of credit obtained from one or several sources. In the OLS regression, the dependent variable is the total amount of credit obtained from one or several sources, while the set of explanatory variables includes license, accounting practices, ID documents, age of business, social capital, value of sales, house, and type of product.

The coefficient for the variables license, ID documents, accounting practices, and social capital are all expected to have positive signs, as their possession increases the hawker’s ability to demonstrate his creditworthiness and obtain larger loans. Age of business is expected to generate a positive sign, as hawkers with older enterprises may have established reputations and developed entrepreneurial abilities to manage larger businesses. The sign of the coefficient for type of product is assumed to be positive, as higher value products may require more working capital. For the coefficient for the value of sales, the expected sign is positive. Results from the Heckman two-stage regression are presented in Table 5.2.
## OLS regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>9663.698*</td>
<td>1.69</td>
</tr>
<tr>
<td>Accounting practices</td>
<td>8264.16</td>
<td>1.61</td>
</tr>
<tr>
<td>ID card</td>
<td>4574.372</td>
<td>1.29</td>
</tr>
<tr>
<td>House</td>
<td>3874.097</td>
<td>1.38</td>
</tr>
<tr>
<td>Age of business</td>
<td>-10.5074</td>
<td>-0.82</td>
</tr>
<tr>
<td>Sales</td>
<td>-0.6813</td>
<td>-0.52</td>
</tr>
<tr>
<td>Social capital</td>
<td>2022.827</td>
<td>1.06</td>
</tr>
<tr>
<td>Type of product</td>
<td>2557.304</td>
<td>1.08</td>
</tr>
<tr>
<td>Constant</td>
<td>-2640.513</td>
<td>-0.17</td>
</tr>
</tbody>
</table>

## Probit Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td>-0.1796</td>
<td>-1.01</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0121</td>
<td>-0.60</td>
</tr>
<tr>
<td>Household earners</td>
<td>0.2052</td>
<td>0.40</td>
</tr>
<tr>
<td>Age of business</td>
<td>0.0011*</td>
<td>1.68</td>
</tr>
<tr>
<td>Mobility</td>
<td>-0.2621</td>
<td>-0.99</td>
</tr>
<tr>
<td>ID document</td>
<td>0.2403</td>
<td>1.33</td>
</tr>
<tr>
<td>License</td>
<td>-0.2241</td>
<td>-1.17</td>
</tr>
<tr>
<td>Accounting practices</td>
<td>0.1340</td>
<td>0.66</td>
</tr>
<tr>
<td>Type of good</td>
<td>0.2187***</td>
<td>3.09</td>
</tr>
<tr>
<td>Constant</td>
<td>0.1315</td>
<td>0.35</td>
</tr>
<tr>
<td>Mills Lambda</td>
<td>-2841.312</td>
<td>-0.16</td>
</tr>
</tbody>
</table>

Number of observations: 364  
Censored observations: 93  
Uncensored observations: 271  
Wald $\chi^2$ (13) = 41.47  
Prob $>\chi^2$ = 0.0001

*** and * indicate significant at 0.01 and 0.10 levels respectively.

Table 5.2: Heckman two-stage model for values of credit obtained
In the equation on access to credit markets (the first step), hawkers with a higher age of business and those selling high value products are more likely to be borrowers. This is as expected. When the results of this probit regression are compared to those of the probit exercise in the previous section, type of product is significant in explaining access in both regressions. Age of business, however, is significant only in explaining access to credit for the one-year rather than the five-year regression. The current age of business is an important variable in determining access to credit markets now. In the five-year probit regression, the influence of age of business is diluted and loses significance in explaining the likelihood of observing a loan transaction at least once in the relevant five-year period.

In the equation explaining the amount of credit received, the amount obtained is significantly higher for hawkers possessing licenses to hawk. This is as predicted. This result may have some policy relevance. In order to increase the total amount of credit obtained, the authorities may consider issuing more licenses to hawkers, as this increases the hawkers’ ability to demonstrate their creditworthiness. No other variable significantly influences the total amount of credit obtained.

The estimation results in Table 5.2 show that the inverse Mill’s ratio (Mill’s lambda) is not significant. This implies that there is no evidence of selection bias in the equation estimating the total amount of credit obtained. However, the OLS estimates obtained by including the inverse Mill’s ratio in the regression produce consistent estimates (Greene, 2000).
5.4 Matching of Hawkers and Lenders in Urban Credit Markets

This section presents the results from an ordered logit model (OLM) estimation to determine the matching of borrowers with lenders. The OLM is extensively used in the literature on bond ratings, organizational ranking, and occupational attainment, where the dependent variable has a natural ranking (Meng and Miller, 1985; Hedstöm, 1994; Long, 1997). Miller and Volker (1985) use ordered probit models to study explicitly the vertical mobility among occupational structures. Uzzi and Gillespie (2002) have applied the OLM to show that social embeddedness (social ties and networks) of the firm with its bankers positively affects the financial performance of the firm.

Here, the OLM is used because the dependent variable, hawker type, has four categories that can be ordered, that is, non-borrowers, those with access to informal lenders (informal borrowers), those with access to semiformal lenders (semiformal borrowers), and those with access to formal lenders (formal borrowers). A hawker is classified by the highest category of lender he has access to. When the categories of the dependent variable can be ranked, ordinary linear regression models become inappropriate, because the spacing between the outcome choices cannot be assumed to be uniform. Additionally, multinomial models cannot be used because they would fail to account for the ordinal nature of the dependent variable (Liao, 1994).

Multinomial logit models, nevertheless, have been common in testing hypotheses about borrowing and lending decisions (Nagarajan, 1992; Esguerra, 1993; Sanchez-Schwarz 1996). Although the estimation by Sanchez-Schwarz implicitly assumes an ordering, none of these earlier studies used the OLM.
Esguerra (1993) used the multinomial logit approach to determine if the observed matching of trader-lenders and farmer-lenders among the different types of rural households is a predictable outcome of the economic actions of these agents, by using data from four rice growing villages in the Philippines. Esguerra groups the sample of households from The Philippines into five categories: households with no lender (non-borrower), with a farmer lender, with a trader lender, with any other kind of informal lender, and with a formal lender.

Sanchez-Schwarz (1996) used a multinomial logit model to test for the assortative matching of borrowers and lenders in the rural credit markets of Mexico. Her model classifies rural entrepreneurs into six mutually exclusive classes: non-borrowers, recipients of commercial credit, those engaged in sales with down-payments, and those dealing with formal lenders, moneylenders, and friends and relatives, respectively. Rural entrepreneurs are then classified with respect to the category of lender that supplies the largest transaction in terms of loan size.

Because the logit models require the categories of the dependent variable to be mutually exclusive and exhaustive, it is assumed here that borrowers with access to lenders along the higher end of the continuum of lending technologies also have access to lenders along the lower end of the continuum. This is a plausible assumption, as lenders at the higher end of the continuum usually have stringent requirements to assess the creditworthiness of potential borrowers. Those who can meet these requirements can be safely assumed to fulfill the requirements of lenders requiring less formal ways to evaluate the creditworthiness of applicants.
In those cases when credit is obtained from only one source, the borrower is classified as borrowing only from that type of lender, but it is assumed that this borrower would fulfill the credit requirements of other lenders that are at the lower end of the lending technology continuum.

The OLM estimation used here is an improvement over the multinomial logit estimation, because the OLM takes into account the order implicit in the classification of the dependent variable, without assuming cardinal distances. The classification of the dependent variables into various categories is based on the pattern of credit allocation that is observed for hawkers in Mumbai. The OLM will help in predicting the probability of a particular hawker obtaining a loan from a particular lender.

5.4.1 General Formulation: The Ordered Logit Model

In ordered logit models (OLM), there is a latent regression specified by:

\[ y^* = x' \beta + \varepsilon \]  

The latent variable \( y^* \) ranges from \( -\infty \) to \( \infty \) and is mapped to an observed variable \( y \). The variable \( y \) provides incomplete information about the \( y^* \) through the following relationship:

\[ y_i = m \text{ if } \tau_{m-1} \leq y_i^* < \tau_m \text{ for } m = 1 \text{ to } J \]  

where the \( \tau \) are the cutpoints, with \( \tau_1 = -\infty \text{ and } \tau_J = \infty \). For all probabilities to be positive, we have \( \tau_1 < \tau_2 < \tau_3 < ... < \tau_J \). Maximum likelihood estimation is used to estimate the regression of \( y^* \) on \( x \) by specifying the form of the error distribution.
In the ordered logit specification, the probability of observing outcome 
\(i\) corresponds to the probability that the estimated linear function, plus a random error 
that is assumed to be logistically distributed with the cumulative distribution 
function \( \Lambda (\cdot) \) and probability density function \( \lambda (\cdot) \), is within the range of the cut points 
estimated for the outcome. Thus,

\[
\Pr(y = i) = \Lambda \left( \tau_i - \sum_{k=1}^{K} \beta_k x_k \right) - \Lambda \left( \tau_{i-1} - \sum_{k=1}^{K} \beta_k x_k \right)
\]

(5)

where the \( \tau \) are the cutpoints, the \( \beta \) are the coefficients to be estimated, and the \( x \) are the 
explanatory variables.

The marginal effect of probability of an event can be calculated by taking a partial 
derivative of expression (5), as follows:

\[
\frac{\partial \Pr(y = i)}{\partial x_k} = \lambda \left( \tau_{i-1} - \sum_{k=1}^{K} \beta_k x_k \right) - \lambda \left( \tau_i - \sum_{k=1}^{K} \beta_k x_k \right) \beta_k
\]

(6)

Since the marginal effect depends on the levels of all variables, it must be decided 
which values (for example, mean or median) of the variables to use while calculating the 
marginal effect. The marginal effects add up to zero because the probabilities add to one. 
For the case of dummy variables, the marginal effects are calculated as a discrete change 
of the dummy variable from zero to one (Liao, 1994; Greene 2000).

While examining access to credit markets, the underlying latent variable is the 
ability to observe and/or demonstrate creditworthiness. Thus, both the borrower’s 
signaling efforts and the lender’s screening efforts are involved. The cutpoints in the 
OLM separate the different categories of hawkers according to their ability to 
demonstrate creditworthiness and the lender’s ability to evaluate this creditworthiness.
Matching is a joint outcome, therefore, where these abilities of borrowers and lenders coincide. In the lowest category, there is no matching, as there may not be any ability to demonstrate or observe creditworthiness. As the latent index measuring this ability improves, a matching occurs. Hawkers falling into the highest category have the greatest ability to demonstrate their creditworthiness to formal lenders, who offer the most attractive terms and conditions on loan contracts.

5.5 Ordered Logit Model Estimation

There are two ordered logit models that are estimated in the context of this dissertation. The first set estimates OLM for all observations in the survey data (borrowers as well as non-borrowers) over the period from June 1999 to May 2004. This estimation thus includes a total of 364 observations, with a dependent variable categorized into four mutually exclusive categories: non-borrowers, formal sector borrowers, semiformal sector borrowers, and informal sector borrowers.

The second ordered logit model leads to an estimation based only on 300 borrowers. Two alternative models are used because of data limitations regarding the category of non-borrowers. More information was collected on borrowers, and the second ordered logit model makes use of this additional information. For both model specifications, the marginal effects are calculated at the median values of the variables, as the median is a more stable measure of central tendency. Table 5.3 shows the expected signs of the explanatory variables used. These expected signs correspond to the signs of the marginal effects.
There are four types of hawkers: non-borrowers, informal borrowers, semiformal borrowers, and formal borrowers. The + sign for the marginal effect indicates a positive effect of the explanatory variable on the probability of being that type of hawker, while a - sign for the marginal effect corresponds to a negative impact of the explanatory variable corresponding to that hawker type. The sign “?” corresponds to an ambiguous impact of the explanatory variable, for those cases when several expected effects of the variable show conflicting signs.
A higher age of business, a near permanent location of business captured through the variable mobility, the high value of products sold, and a high value of sales make it more likely that the hawker is a borrower, by increasing his creditworthiness. The coefficient of the level of education is expected to have a positive sign for formal and semiformal borrowers, as hawkers with more education may have advantages in understanding the loan application procedures of the formal and semiformal lenders. Additionally, less educated hawkers are expected to be non-borrowers or informal borrowers, thus implying a negative sign for the marginal effects of this variable for these two types of lenders.

Possession of ID document, a license, and accounting practices are expected to have a positive effect on being a formal or semiformal borrower, as possessing such endowments may be required for credit contracts. Possession of such formal characteristics may reduce the probability of being a non-borrower. Social capital is assumed to generate a positive sign for formal and semiformal borrowers, as institutional lenders rely on such outside sources to gather information about their potential clients. Informal lenders mostly either know their borrowers through kinship or proximity or may have past or existing business relations with them. Hawkers with a larger accumulation of social capital are less likely to be non-borrowers. This variable may not, however, be crucial for informal lenders in order to make their lending decisions; thus, the sign of this variable for the category of informal borrowers is ambiguous.

The impact of religion on being an informal borrower is expected to be ambiguous. Muslim hawkers, who are in general against borrowing due to their religious beliefs, can be informal borrowers, as most commercial suppliers do not charge explicit
interest. Religion is expected to have a positive sign corresponding to borrowers from semiformal sources, as there are various cooperative organizations offering sources of finance to specific Hindu communities.

The coefficient for the variable household earners is expected to have a positive sign for the categories of formal and semiformal borrowers, as institutional lenders may be looking at the household cash flows as a screening strategy. In addition, this variable is expected to have a negative sign for non-borrowers and may not be an important criterion for informal lenders. The variable house is expected to generate a positive sign for formal and semiformal borrowers, as hawkers possessing collateralizable assets may have more access to institutional loans. This variable may not matter in the lending technology of informal borrowers. The following sections describe the specifications and results of OLMs as applied in the context of this dissertation.

5.5.1 Model 1: The Ordered Logit Model for All Hawkers

The ordered logit model is of use in understanding what characteristics are important in the matching of certain types of borrowers and certain types of lenders and for what types of hawkers there is no matching. The dependent variable, hawker type, is an ordered response with four categories, namely, 0 = non-borrowers, 1 = informal borrowers, 2 = semiformal borrowers, and 3 = formal borrowers. The determinants include religion, household earners, license, accounting practices, ID document, age of business, mobility, and type of product.
The estimation is based on 364 observations, categorized into four mutually exclusive and exhaustive categories: 64 non-borrowers, 7 borrowers from the formal sector, 37 borrowers from the semiformal sector, and 256 borrowers from the informal sector.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Median</th>
<th>Coefficient</th>
<th>Marginal Effect (non-borrowers)</th>
<th>Marginal Effect (informal borrowers)</th>
<th>Marginal Effect (semiformal borrowers)</th>
<th>Marginal Effect (formal borrowers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td>1</td>
<td>0.1252 (0.47)</td>
<td>-0.0159 (-0.46)</td>
<td>0.0020 (0.28)</td>
<td>0.0014 (0.48)</td>
<td>0.0025 (0.48)</td>
</tr>
<tr>
<td>Education</td>
<td>8</td>
<td>-0.0097 (-0.31)</td>
<td>0.0012 (0.31)</td>
<td>-0.0001 (-0.13)</td>
<td>-0.0009 (0.31)</td>
<td>-0.0002 (-0.31)</td>
</tr>
<tr>
<td>Household earners</td>
<td>1</td>
<td>0.0760 (0.77)</td>
<td>-0.0093 (-0.73)</td>
<td>0.0004 (0.13)</td>
<td>0.0073 (0.81)</td>
<td>0.0016 (0.80)</td>
</tr>
<tr>
<td>Accounting practices</td>
<td>0</td>
<td>-0.0002 (-0.00)</td>
<td>0.00002 (0.00)</td>
<td>-8.78e-07 (-0.00)</td>
<td>-0.0001 (-0.00)</td>
<td>-3.51e-06 (-0.00)</td>
</tr>
<tr>
<td>License</td>
<td>0</td>
<td>-0.0283 (-0.09)</td>
<td>0.0035 (0.09)</td>
<td>-0.0002 (-0.07)</td>
<td>-0.0027 (0.09)</td>
<td>-0.0006 (-0.09)</td>
</tr>
<tr>
<td>Identification card</td>
<td>1</td>
<td>0.7653*** (2.66)</td>
<td>-0.1204** (-2.38)</td>
<td>0.0532 (1.50)</td>
<td>0.0558*** (2.68)</td>
<td>0.0114* (1.98)</td>
</tr>
<tr>
<td>Age of business</td>
<td>180</td>
<td>0.0003 (0.32)</td>
<td>-0.00004 (-0.32)</td>
<td>1.76e-06 (0.13)</td>
<td>0.0003 (0.33)</td>
<td>7.06e-06 (0.37)</td>
</tr>
<tr>
<td>Mobility</td>
<td>1</td>
<td>-0.0213 (-0.06)</td>
<td>0.0026 (0.06)</td>
<td>-0.0001 (-0.07)</td>
<td>-0.0021 (-0.06)</td>
<td>-0.0005 (-0.06)</td>
</tr>
<tr>
<td>Type of product</td>
<td>3</td>
<td>0.2167* (1.90)</td>
<td>-0.0264* (-1.93)</td>
<td>0.0011 (0.15)</td>
<td>0.0207* (1.77)</td>
<td>0.0046 (1.49)</td>
</tr>
</tbody>
</table>

Cutpoint1: -0.2213 (SE=0.5597)  
Cutpoint2: 3.4386 (SE=0.6015)  
Cutpoint3: 5.3964 (SE=0.6963)  
Log Likelihood = -305.99  
Likelihood Ratio Test $\chi^2 (9) = 15.24$  
Number of observations = 364

Z-statistics in parentheses  
SE=standard error  
***, **, * indicate significant at 0.01, 0.05 and 0.10 levels respectively.

Table 5.4: Ordered logit estimated for all hawkers
The results from the estimation are reported in Table 5.4. The median values for the variables used in the computation of the marginal effects are shown in the table. So, the representative hawker in the marginal effects exercise is Hindu, with 8 years of schooling, the hawker is the only household earner, keeps his accounts in the head, does not have a license but has ID document, has been hawking for 15 years, in the same place, selling electronic items, stationery, and accessories. The marginal effects indicate how many percentage points the probability of being in one category differs for changes in the value of the dependent variable.

Possession of ID documentation and the type of product are the only two significant variables in this estimation. From the marginal effects, hawkers with ID have a 12 percentage points lower probability of being non-borrowers as compared to those who did not possess an ID document. For each additional level in the type of product sold, the probability of being non-borrowers decreases three percentage points.

None of the variables is significant in explaining when a hawker belongs to the category of informal borrowers. This may reflect the fact that the majority of hawkers, across a broad variety of types, use sales on credit from their suppliers of merchandize. Access to institutional sources (formal and semiformal) is more restricted. Hawkers with ID document have a six percentage point higher probability of being semiformal borrowers and a one percentage point higher probability of being formal borrowers, as compared to those with no ID document. Each one unit increase in the category of type product sold increases the probability of being a semiformal borrower by two percentage points.
None of the other marginal effects are significant. In the next model, the addition of variables that could not be observed for non-borrowers increases the number of significant marginal effects.

5.5.2 Model II: Ordered Logit Model for Borrowers

This second model predicts the factors that determine the matching of various types of borrowers with various types of lenders. The dependent variable, hawker type, is an ordered response with three categories: 1 = informal borrowers, 2 = semiformal borrowers, and 3 = formal borrowers. The determinants include religion, education, household earners, license, accounting practices, ID document, age of business, mobility, house, social capital, value of sales, and type of product. The specification includes 300 observations, categorized into three mutually exclusive categories: 7 formal sector borrowers, 37 semiformal sector borrowers, and 256 borrowers from the informal sector. The estimation results are presented in Table 5.5. The marginal effects have been computed for the median values of the variables shown in the table.

Once the OLM is computed only for borrowers, religion is a significant variable, with a negative sign for borrowers from informal sources. Thus, Hindu hawkers have 9 percentage points lower probability of being informal borrowers as compared to Muslim hawkers. Additionally, Hindu hawkers have 8 percentage points higher probability of being semiformal borrowers and a 1 percentage point higher probability of being formal borrowers, as compared to Muslim hawkers. In most cases, commercial suppliers do not charge explicit interest rates, while institutional lenders do.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Median</th>
<th>Coefficient</th>
<th>Marginal Effect (Informal borrowers)</th>
<th>Marginal Effect (Semiformal borrowers)</th>
<th>Marginal Effect (Formal borrowers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td>1</td>
<td>0.8828*</td>
<td>-0.0929** (-2.06)</td>
<td>0.0789** (2.04)</td>
<td>0.0139* (1.66)</td>
</tr>
<tr>
<td>Education</td>
<td>8</td>
<td>0.0153 (0.30)</td>
<td>0.0022 (0.30)</td>
<td>0.0018 (0.30)</td>
<td>0.0004 (0.30)</td>
</tr>
<tr>
<td>Household earners</td>
<td>2</td>
<td>-0.1697 (-1.10)</td>
<td>0.2416 (1.07)</td>
<td>-0.0202 (-1.07)</td>
<td>-0.0040 (-1.00)</td>
</tr>
<tr>
<td>Accounting practices</td>
<td>0</td>
<td>0.7356 (0.91)</td>
<td>-0.1304 (-0.81)</td>
<td>0.0156 (0.83)</td>
<td>0.0248 (0.71)</td>
</tr>
<tr>
<td>License</td>
<td>0</td>
<td>1.0109 (1.15)</td>
<td>-0.1914 (-1.00)</td>
<td>0.1521 (1.05)</td>
<td>0.0393 (0.80)</td>
</tr>
<tr>
<td>Identification card</td>
<td>1</td>
<td>1.3042* (1.68)</td>
<td>-0.1186** (-2.30)</td>
<td>0.1012** (2.27)</td>
<td>0.0174* (1.78)</td>
</tr>
<tr>
<td>Age of business</td>
<td>180</td>
<td>-0.0019 (-1.15)</td>
<td>0.0003 (1.10)</td>
<td>-0.0002 (-1.10)</td>
<td>-0.00004 (-1.01)</td>
</tr>
<tr>
<td>Mobility</td>
<td>1</td>
<td>0.6318 (0.94)</td>
<td>-0.0725 (-1.15)</td>
<td>0.0614 (1.14)</td>
<td>0.0111 (1.11)</td>
</tr>
<tr>
<td>House</td>
<td>1</td>
<td>1.3935** (2.15)</td>
<td>-0.1229*** (-2.66)</td>
<td>0.1050*** (2.63)</td>
<td>0.0179* (1.90)</td>
</tr>
<tr>
<td>Social capital</td>
<td>2</td>
<td>1.0058*** (3.37)</td>
<td>-0.1432*** (-3.30)</td>
<td>0.1197*** (3.20)</td>
<td>0.0236** (2.15)</td>
</tr>
<tr>
<td>Sales</td>
<td>5060</td>
<td>-0.0002 (-0.90)</td>
<td>0.00003 (0.95)</td>
<td>-0.00002 (-0.94)</td>
<td>-4.37e-06 (-0.92)</td>
</tr>
<tr>
<td>Type of product</td>
<td>3</td>
<td>0.0891 (0.33)</td>
<td>-0.0127 (-0.33)</td>
<td>0.0106 (0.33)</td>
<td>0.0021 (0.33)</td>
</tr>
</tbody>
</table>

Cutpoint1 5.0534 (SE=1.3299) Log Likelihood = -126.2531
Cutpoint2 7.1867 (SE=1.3862) Likelihood Ratio Test $\chi^2 (12) = 36.18$
Number of observations = 300 Prob $> \chi^2 = 0.0003$

Z-statistics in parentheses
***, **, * indicate significant at 0.01, 0.05 and 0.10 levels respectively.

Table 5.5: Ordered logit estimates for borrowers
Thus, Muslim hawkers may prefer to borrow from informal lenders due to their religious beliefs, but they may avoid institutional lenders that charge explicit interest. Religion matters mainly for the category of semiformal borrowers. This may be reinforced by the fact that some cooperative banks have a preference for lending to people from specific Hindu castes.

Account keeping method is not a significant variable in explaining matching. Moreover, the marginal effects for weekly sales, mobility, and time in the hawking business are not significant, either. This suggests that most hawkers qualify for supplier credit while most of them may not meet the more stringent requirements of formal lenders. A notebook is not enough for a bank; financial statements may be required.

Possession of a hawking license is a more reliable signal of formality and the stability of the hawking enterprise. However, it is not a significant attribute in explaining matching. Furthermore, the municipal corporation stopped issuing licenses for the past two decades and only around 18 percent of the hawkers in Mumbai have a license.

Possession of documents and assets that signal more strongly a higher degree of formality do matter, however. Not surprisingly, ownership of a house that could potentially be pledged as collateral matters, even in the absence of a mortgage, as a signal of wealth and stability. As compared to hawkers who do not own a house, hawkers owning one have 12 percentage points lower probability of being informal borrowers and 11 percentage points and 2 percentage points, higher probabilities of being semiformal and formal borrowers, respectively. This is not surprising, as institutional lenders incur lower transaction costs and lower perceived risks in dealing with clients who can pledge such collateral.
Both the possession of ID documents and the stock of social capital increase the chances of being a semiformal or a formal borrower and decrease the chances of being an informal borrower.

The marginal effects related to the possession of ID documentation indicate that there are 10 percentage points of higher probability of being a semiformal borrower and 2 percentage points of higher probability of being a formal borrower as well as 12 percentage points lower probability of being an informal borrower compared to those who do not possess ID documents.

For the continuous variable capturing the influence of social capital, the marginal effects suggest that membership in an additional organization increases the probability of being a semiformal borrower by 12 percentage points, while an additional membership increases the probability of being a formal borrower by 2 percentage points and it reduces the probability of being just an informal borrower by 14 percentage points.

Thus, hawkers who possess ID documents and are members of formal or informal organizations are more likely to match with institutional lenders, such as semiformal or formal institutions. Hawkers with ID documents and membership in organizations are less likely to be only informal sector borrowers and not have loans from institutional sources. This conclusion seems justified, as informal lenders and commercial suppliers operate mainly on the basis of trust and personal relationships and thus do not require specific documentation or collateral. Formal lenders rely more on formal documentation and referrals to collect information on applicants. Thus, they incur less transaction costs in dealing with hawkers who possess ID documents and who are members of formal or informal organizations.
Demographic characteristics such as the number of household earners and the level of education of the hawker are not significant in determining the matching between borrowers and lenders.

This is because, apparently, the most important assets in this informal market are the location of the hawking enterprise and referrals, which may be independent or very weakly related to demographic characteristics. Social networks (including connections with municipal authorities and local goons) may be important in capturing and maintaining a good business location, as there are no specifically allotted spaces for hawkers. Some hawkers may seek rents from the location by renting the space to other hawkers. This is all done in an informal way.

Education could gain a significant influence on the matching of borrowers and lenders when innovative lending technologies that are not as stringent as the traditional banking technology were introduced and required hawkers to maintain simple accounts of their transactions. Moreover, some types of lender, such as the new microfinance organizations do in other countries, may evaluate the household’s composition and cash flows before they make loan decisions.

A larger number of earning members may increase opportunities for diversification and income flows, thereby increasing the hawker’s ability to repay. These types of relationships are not observed, however, due to the lending technology vacuum that currently exists in Mumbai.

The relevant portions of the Mumbai lending technology continuum for hawkers is dominated by commercial banks and cooperative banks, to some extent, and by the commercial suppliers group among informal lenders.
Since commercial suppliers do not use a lending technology that relies on the hawker’s education and household composition, variables such as education and household earners do not explain the matching of borrowers with these lenders. This is in contrast with observations in other countries where microfinance has flourished. Institutional lenders in Mumbai, on the other hand, request more traditional evidence of creditworthiness. This leaves a middle fringe of hawkers, in between the two extremes, that are not supplied with the financial services that might improve their welfare. Innovation is needed to fill this vacuum.

<table>
<thead>
<tr>
<th></th>
<th>Informal borrower</th>
<th>Semiformal borrower</th>
<th>Formal borrower</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>0.9209</td>
<td>0.0690</td>
<td>0.0101</td>
</tr>
<tr>
<td>Hindu</td>
<td>0.8280</td>
<td>0.1480</td>
<td>0.0240</td>
</tr>
<tr>
<td><strong>ID document</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without ID</td>
<td>0.9466</td>
<td>0.0467</td>
<td>0.0066</td>
</tr>
<tr>
<td>With ID</td>
<td>0.8280</td>
<td>0.1480</td>
<td>0.0240</td>
</tr>
<tr>
<td><strong>House</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-owners</td>
<td>0.9510</td>
<td>0.0430</td>
<td>0.0061</td>
</tr>
<tr>
<td>Owners</td>
<td>0.8280</td>
<td>0.1480</td>
<td>0.0240</td>
</tr>
<tr>
<td><strong>Social Capital</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membership in no organization</td>
<td>0.8884</td>
<td>0.0969</td>
<td>0.0147</td>
</tr>
<tr>
<td>Membership in one organization</td>
<td>0.7444</td>
<td>0.2165</td>
<td>0.0391</td>
</tr>
<tr>
<td>Membership in two organizations</td>
<td>0.5158</td>
<td>0.4865</td>
<td>0.1001</td>
</tr>
</tbody>
</table>

Table 5.6: Predicted probabilities
Table 5.6 shows the predicted probabilities for the variables that are significant in the second OLM exercise. The predicted probabilities are calculated, in each case, by holding all the other variables at their median levels. A comparison of the predicted probabilities shows the expected influence of different values for the corresponding variable, holding everything else constant at the median value of the other variables. Indeed, when all variables are at their median values, the computation based on the OLM results predicts that 83 percent of the hawker-borrowers would have received credit from an informal (mostly a commercial supplier) sources, that 15 percent would have received credit from a semiformal source (mostly a cooperative bank), and that only 2.4 percent would have received credit from a formal source, during the year under analysis.

This is one of the most important results from the dissertation, as it reveals a very fragmented (polarized) market. At one extreme, in one segment of the market, most of the hawkers receive goods on credit, as part of the modus operandi of their business, but they seldom have access to other types of financial services. At the other extreme of the lending technologies continuum, the proportion of hawkers with access to the more attractive terms and conditions of formal sector credit is miniscule. Compared to other countries with similar urban informal sectors, where microfinance flourishes, there seems to be a large middle ground of unsatisfied demands for financial services in Mumbai.

Table 5.6 reveals the influence of different values of some relevant variables, in comparison to this median hawker-borrower. Religion matters. Holding everything else constant at the median, Muslim hawker-borrowers are 9 percentage points more likely to be informal borrowers and 8 percentage points less likely to be semiformal borrowers, when compared to Hindu hawkers.
Documentation matters. Hawker-borrowers with ID documents have almost four times the probability of being a formal borrower (2.4 percent) than hawkers without documentation (0.7 percent). Documentation also matters in the semiformal sector, where hawkers with documents have a 14.8 percent probability of being a client, compared to 4.7 percent for those without documents. The difference is of a similar order of magnitude in the semiformal market.

Collateralizable assets matter. Hawker-borrowers who own a house have four times the probability of being a formal borrower (2.4 percent) compared to hawkers who do not (0.6 percent). This type of wealth also matters in the semiformal sector, where hawkers with a house have a 14.8 percent probability of being a client, compared to 4.3 percent for those without real estate property in Mumbai.

Social capital also matters. The higher the number of organizations a hawker belongs to, the higher are his chances of being an institutional borrower. In fact, a hawker-borrower who belongs to more than one organization has a probability of being a formal borrower (10.0 percent) that is about six times greater than a hawker-borrower with no membership in any organization (1.5 percent).

The same order of magnitude is revealed in a comparison about access to the semiformal credit market, where the probability is 48.7 percent for those with multiple memberships, compared to 9.7 percent for those without memberships. In a more detailed analysis of the influence of social capital, the length of the relationship and status of the organization would be highlighted. This information is not available here.
In this section, the ordered logit model was fitted to test for the hypothesis that hawkers possessing more formality-related characteristics are matched with lenders at the higher end of the lending technology continuum. The econometric results support this hypothesis, with relevant formality-related characteristics associated with the possession of an identification document, membership in various formal and informal organizations, and ownership of a house. Hawkers with an endowment of these characteristics display a higher probability of being semiformal and formal borrowers. This occurs because the transaction costs for institutional lenders are lower when screening hawkers with formality-related endowments; hawkers with formality-related characteristics can actually participate in transactions with institutional lenders at a lower cost, as most of these costs are already sunk costs for them.
### Table 5.7: OLS estimates for the value of sales regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>3613.944***</td>
<td>4.71</td>
</tr>
<tr>
<td>Accounting Practice</td>
<td>3442.582***</td>
<td>4.48</td>
</tr>
<tr>
<td>Type of product</td>
<td>1104.481***</td>
<td>3.78</td>
</tr>
<tr>
<td>Age of business</td>
<td>-1.6289</td>
<td>-0.68</td>
</tr>
<tr>
<td>Hours hawk</td>
<td>-0.2198.531</td>
<td>-1.39</td>
</tr>
</tbody>
</table>

Number of observations: 300  \( R^2 = 0.1843 \)
\( F(5,294)=13.29 \)  \( \text{Prob}>F = 0.0000 \)

*** corresponds to significance at the 1 percent level.
CHAPTER 6

CONCLUDING THOUGHTS: MISSING FINANCIAL SERVICES

The goals of this dissertation have been to analyze varying degrees of access to financial services by hawkers and to examine the characteristics of the observed matching patterns between various types of hawker-borrowers and various types of lenders (formal, semiformal, and informal).

To accomplish these goals, the dissertation first undertook a systematic review of the past and current literature on access to credit and on the matching between borrowers and lenders. Next, the dissertation adapted a theoretical model in order to explain the expected patterns of matching between borrowers and lenders, according to various degrees of formality of both the hawking business and the lending technology used to achieve a contract.

A basic model was first developed to describe the behavior of borrowers and of lenders, under simplified assumptions of symmetric information and no transaction costs, and to describe a contract equilibrium. This model was then extended to include borrower and lender transaction costs, in order to understand the nature of existing matching patterns, which could not be explained in the absence of these costs and in the absence of differences among types of borrowers and types of lenders.
A match occurs when the endowment of certain characteristics of a borrower allow him to engage in the transaction at a low cost and, at the same time, certain characteristics of the lending technology allow the lender to screen and monitor this borrower at a low cost. The matching model predicts that hawkers with more formality-related characteristics, such as the possession of ID documents and a license to hawk, the keeping of their accounts in an informal notebook, and the possession of higher endowments of social capital and collateralizable assets, are more likely to match with more formal types of lenders, along the lending technology continuum.

An empirical investigation of informal urban markets was then undertaken, using primary data collected by the author on hawkers and their lenders in Mumbai, India. These hawkers show substantial stability in their occupations. The average age of the hawking business is 16 years, and over 90 percent of the hawkers never changed their business location ever since they started. In contrast to other parts of the world, hawking is a male dominated activity in Mumbai.

Their enterprises are very small, requiring long hours of work, and their management requires very little formality. Most of them keep their accounts in their head. This informality, however, deprives them of low-cost means of signaling their creditworthiness to formal lenders. This inability to borrow from institutional sources, combined with the nature of their business, makes commercial suppliers the most dominant source of credit for hawkers. Very limited access to semiformal and formal credit was observed.
Using the primary data collected on hawkers in Mumbai, econometric results from a probit regression show that having had at least one loan from any source (not including friends and relatives), in the five-year period under study, was positively influenced by the number of income earners in the household. This is as expected, because the number of household earners is associated with a greater number of sources (that is, with more diversification) and possibly with higher levels of income. Moreover, hawkers selling higher-value products are more likely to have participated in credit markets during that five year period.

Having been a borrower during the one year before the survey was also significantly influenced by the type of good sold and by the age of the hawking business, as a result of another probit estimation, used as the first stage of a Heckman regression. Older businesses would have acquired the ability to borrow more. The significant influence of possessing a license to hawk was confirmed by the results of a Heckman two-stage regression estimation, using the amount of credit received during the year before the interview as the dependent variable.

To identify empirical determinants of the matching between some types of borrowers and some types of lenders, an ordered logit model was estimated in contrast to earlier studies, which used multinomial logit models.

Borrowers who possess ID documents, higher endowments of social capital, and collateralizable assets are more likely to be matched with formal and semiformal lenders. Indeed, institutional lenders can evaluate the creditworthiness of a hawker with an endowment of formality-related characteristics at comparatively lower costs than when they attempt to deal with more informal hawkers.
At the same time, for the less informal hawker the corresponding signaling costs are already sunk costs, thus reducing his transaction costs of borrowing under the more strict requirements of institutional lenders.

Religion was also significant in explaining the matching patterns between borrowers and lenders observed. Everything else the same, Muslim hawkers are more likely to have loans from informal lenders, while Hindu hawkers are more likely to match with institutional lenders. Muslim hawkers mainly borrow from commercial suppliers, who in most cases do not charge explicit interest. The matching of Hindu hawkers with semiformal lenders reflects the specialization of these organizations in lending to Hindu individuals.

None of the other demographic variables, along with the hawking business-related variables were significant in explaining the matching patterns observed in Mumbai. This might be attributed to the stronger influence, in these informal markets, of other characteristics, such as the diligence, honesty and initiative exhibited by the hawker and verified through character references and community information and, therefore, not observed in the data set collected from the survey. Indeed, if these other traits that can be observed only at the personal level matter more, it would be difficult and possibly not effective to develop credit scoring methods in this environment. Client relationships seem to be, instead, the anchor of credit transactions.

This dissertation suggests explanations for the limited access to institutional credit exhibited by hawkers from two perspectives: demand and supply circumstances. Most hawkers rely on commercial suppliers for their working capital and typically do not obtain funds for this purpose from more formal lenders.
Several of the reasons suggested in the literature about the advantages and disadvantages of interlinked transactions (that is, the purchase of goods, on the one hand, and credit, on the other) would apply here (for example, Basu, 1997), but to address the complex dimensions of interlinked contracts was not the purpose of this dissertation, and the data that would be required for this analysis were not collected in the survey. However, risk-pooling and lower transaction costs may be among the strong advantages of combining the two transactions, which would then facilitate access to credit, while interlinking may also facilitate the exercise of market power by the lender, which would reduce the welfare value of the credit relationship.

The focus of the dissertation is on the limited number of transactions observed in institutional credit markets, where the hawker could access a broader array of financial services of value to his household. In contrast, commercial suppliers do not provide other financial services, such as savings facilities, remittances, payments instruments and insurance, which, are routinely provided by formal financial institutions. For example, in the context of the recent massive floods in Mumbai, which washed out most hawking businesses, insurance policies for hawkers could have been extremely useful.

Additionally, credit from institutional sources may be demanded to finance fixed investment, such as the assets needed for business expansion or for transformation (as when the hawker becomes a shopkeeper) or in buying a house. The loan contracts supplied by institutional lenders in Mumbai offer better conditions than moneylenders and other informal sources, in terms of loan sizes, terms to maturity, and interest rates.
There seems to be an unsatisfied demand for these other types of credit. Many hawkers who do not borrow from institutional sources claim that they do not apply due to the documentation requested and other requirements of formal and semiformal institutions. Thus, they self-select out, even when they may have a legitimate demand for financial services, because there is not an appropriate technology that would allow them to demonstrate their creditworthiness at a sufficiently low cost. These pessimistic perceptions may change with the introduction of a new lending technology that offered a variety of financial services at reasonable transaction costs.

The descriptive statistics from the sample show that hawkers are small informal businesses, with few opportunities for expansion. In their earlier stages, they may expand by enlarging their inventory and/or adding new types of goods. Intense competition, a congestion in the streets that does not allow for spreading the business out, and saturation of the market will eventually limit these opportunities for increasing the size of the enterprise. Once this steady state is achieved, the demand for credit for working capital would stagnate.

One of the indicators that may support this claim is the lack of a strong correlation between the age of the hawking business, and the value of its weekly sales. Indeed, since hawking is undertaken in the overcrowded markets of Mumbai, there is little scope for expansion. In the aggregate, opportunities for expansion will come from population and income growth. For the individual entrepreneur, one option is to increase the number of locations for hawking. This may, in any case, be difficult, because hawking locations are protected either through the hawking union or through informal networks.
Additional locations would introduce, moreover, agency costs, since the hawker would now have to monitor employees in several locations. Another option is to graduate into a shopkeeper and develop a more formal business. Limitations in access to institutional credit, associated with the difficulties to establish creditworthiness, identified here, may be important barriers to this transformation and may limit opportunities to increase household income and pull out of poverty.

An important implicit finding of this dissertation may be, therefore, that the most significant demand for formal credit services from hawkers may come at the time of entry and at the time of exit. On the one hand, to claim a hawking location, it may be necessary to bribe the informal owner of this location or it may be necessary to pay him a rent on a fixed or on a profit-sharing basis. The credit-constrained potential hawker may need extra funds for this purpose, in addition to acquiring the basic tools for the trade. It is likely that loans from friends and relatives play an important role at this stage of entry.

On the other hand, access to credit may also become vital when a hawker is attempting to graduate to the next level of entrepreneurship. For example, if a hawker wants to become a shopkeeper, he may need much larger amounts of credit, to be able to invest in fixed assets. The nature of such opportunities calls for larger loans, which are usually only offered by formal financial institutions.

In the stages between entry and exit, however, particularly when the hawker is in some sort of steady state, it seems that commercial suppliers may be the most convenient source of credit for this activity, given the interlinked contracts offered by suppliers. Even at this stage, nevertheless, commercial suppliers cannot offer other financial services that are of great value for the household of the hawker.
Moreover, credit from alternative sources could be used by the hawker to buy the goods to be resold from several suppliers, as some hawkers claimed that goods obtained on credit were not of good quality. Buying on cash may improve a hawker’s bargaining power, by making him less defenseless in the negotiation of the terms and conditions of his commercial transactions. Additional research on this will be useful.

On the supply side, a key finding of this dissertation is the lending technology vacuum observed in Mumbai. This vacuum is identified in comparison to the international as well as the national continuum of lending practices. At the international level, there are various types of financial technologies that have been adopted to specifically cater to the demands for financial services by the urban informal sector.

Examples of microfinance programs from Bangladesh, Bolivia, Colombia, Ecuador, El Salvador, Indonesia, Kenya, Peru, The Philippines or South Africa are a case in point. At the Indian level, there seem to be no adoptions in Mumbai of approaches similar to the SEWA (Self Employed Women’s Association) model, catering to working women in the informal sector in the city of Ahmedabad in Gujarat [http://www.sewa.org/] or extensions of the success of the non-government program BASIX to this part of the country [http://www.basixindia.com].

Among other reasons, this lending technology vacuum may be due to barriers to entry for new types of semiformal lenders in the informal urban markets of Mumbai. These barriers to entry may be associated with stringent and uncertain government regulations for the start of a lending business or with the implicit collusion of existing lenders to protect their shares of the market.
Moreover, the clients themselves are subject to a high degree of regulatory risk, given the arbitrary municipal interventions in this activity. Thus, the introduction of financial innovations in this environment may not only be costly but it may look quite risky.

Several policy implications emerge from these considerations. First, given the crucial role of new lending technologies in reaching non-traditional clientele, innovations in this area should be strongly encouraged. Innovations can be of various types: Product innovations and process innovation.

A variety of additional financial products, such as savings deposit facilities, payments and remittances services, insurance services, and other credit facilities could be introduced. This may be done by employing well-trained officers, familiar with the innovative approaches, who can visit hawkers and familiarize them with the package of new financial services offered. More importantly, loan officers must be carefully trained in new screening and monitoring techniques, including the estimation of cash flows for loan applicants who do not possess financial statements. Other innovations would enhance incentives to repay in an informal contract enforcement environment. Because positive externalities result from innovations, appropriate policy intervention should encourage transfers of technology and learning by doing in this area.

Detailed knowledge of the clientele will be useful in understanding the typical cash flows from various types of hawking activities and in helping to decide on repayment schedules, loan sizes, and terms to maturity for such clientele. Financial institutions can also make use of non-traditional collateral to guarantee the loans.
One possibility is to seek to incorporate commercial suppliers as cosigners/guarantors for the hawkers. An incentive for this may be to improve the terms and conditions under which suppliers receive loans from financial institutions for their own operations. The suppliers are usually established enterprises with medium or large scale operations and they typically have collaterizable assets that could support the combined credit portfolios of their own activities and those of the clients.

A second policy implication arises in terms of the role of both the national and the local government in credit markets. Due to the nature of innovations, the government should encourage and support improvements in lending technologies. There is considerable international experience in the development and transfer of microfinance technologies, which has not been sufficiently tapped in India. For this to be possible, however, the government should provide an environment in which property rights, contract enforcement, and financial services prosper. There may be a need to improve the legal framework for contract design and enforcement, so the new types of collateral are supported by the institutional infrastructure. Also, information sharing among various types of lenders should be promoted and legalized.

Third, and very important, the government should find better ways to regulate hawking. The nature of hawking encourages informal ways of securing and maintaining business locations and the asking for and payment of bribes to municipal officers and the police, so that the goods will not be confiscated. Constant raids by the municipal authorities to eliminate hawkers from the non-hawking zones not only reduce the respective hawkers’ revenues but they also discourage lenders to engage in contracts with such volatile enterprises.

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The authorities should be realistic in recognizing that hawkers are there to stay. Hawking could be regulated better, however. This could be done by issuing permits and photo identification cards to the existing hawkers. Hawkers who are leaving the business should be required to return their permits to the authorities, who can then allocate these vacant locations to individuals who are trying to enter this business on more market-based terms.

This would not only increase the revenue of the municipal authorities but it may reduce the parallel financial arrangements (for example, bribes) that exist in such settings. Moreover, possession of formal documents, such as hawking permits, could increase the potential matching of hawkers with more formal types of lenders, and allow them to enjoy attractive combinations of credit contract terms and conditions. All this will require, however, planning and proper implementation. These policy implications could potentially be applied to other metropolises in India, which are facing similar difficulties in the regulation of hawking enterprises and their limited access to financial services.
BIBLIOGRAPHY


