STUDIES OF SMALL BUSINESS FINANCE

The Impact of Usury Laws on the Effectiveness and Efficiency of the Operation of Small Business

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THE INTERAGENCY TASK FORCE ON SMALL BUSINESS FINANCE

Board of Governors of the Federal Reserve System
Federal Deposit Insurance Corporation
Office of the Comptroller of the Currency
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Small Business Administration
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I. INTRODUCTION

This study is intended to serve as a basis for drawing conclusions regarding the impact of usury laws on the efficiency and effectiveness of the operation of small business firms. Particular attention is to be given to any competitive advantage or disadvantage to small businesses of government-imposed interest rate ceilings vis-a-vis large businesses. No new investigations are undertaken. Rather the intent is to make use of conceptual models and existing empirical studies as a means for drawing implications regarding the impact of such ceilings on the operation of small businesses.

The rest of this section of the study is devoted to a brief discussion of the effects of price constraints in general, and to a statement of the complex of price and other restrictions that tend to pervade the financial markets in which small businesses operate. Section II will summarize the effects of price ceilings in a conceptual decision-making model of both a small business borrower and a financial intermediary lender. Section III will critique existing empirical work and its relevance to the small business loan market and Section IV will summarize final conclusions about the impacts of such restrictions on small businesses.
Price Restrictions in Financial Markets

In a free and perfectly functioning financial market, loanable funds of all types will be allocated to their best expected use. The requirements for financial markets to operate in this way are no transactions costs, atomistic suppliers and demanders of funds, and free access to information regarding the prices of financial claims. A market with these characteristics will be both efficient and fair. Not only will financial resources be allocated to their highest risk adjusted return, but each financial market participant will be treated equally. Discrimination among participants will be made only on the basis of price and timing of market entry. In this market, lenders or suppliers of capital are compensated only for the services they perform (e.g., pooling funds, production of information regarding borrower risk) and pay only for the services they receive. Competition will ensure that the price of capital just compensates for the time and risk involved.

In this market, any attempt by government to constrain the activities or arrangements undertaken by market participants will serve to increase both the cost of operating in these markets and the price of financial claims, and will, thereby, reduce aggregate economic welfare. Consequently, the rationale for government intervention must rest upon an assumption that markets are imperfect and, as a result, that financial resources are not allocated properly. Basically, the claim must be that actual markets have
non-productive transactions costs, lack true competition, do not have a free flow of price information, or simply, do not allocate funds to their best use.

The complex of governmental regulations and constraints on financial markets has developed over the past 50 years and it is pervasive. There are quantity and price restrictions on both assets and liabilities of all major types of financial intermediaries. Depository institutions are restricted to lending mostly for home mortgages. Commercial banks generally cannot purchase equity claims. Both are severely restricted in terms of what rates they can pay on deposits. Business firms needing capital face restrictions on issuing equity under state "Blue Sky" laws and Securities and Exchange Commission financial statement requirements. Possibly as important as any, the Federal Government has attempted to allocate the flow of credit in accordance with "national preferences" through direct participation in markets (e.g., FNMA, FHLBB advances). Of course, one of the more general and long-standing restrictions has been the existence of a ceiling rate on certain types of business and consumer loans.

Such usury laws place an explicit maximum on the rate of interest that may be charged on a particular type of loan or by a particular lender. For loans to the ultimate user of the funds (as opposed to loans to intermediaries themselves (e.g., deposits)), the restrictions tend to have been adopted by states and currently tend to be
controlled by state legislatures. These ceilings differ in a number of important respects, including:

(1) whether the control is on a particular kind of loan or is meant to cover all types of borrowing arrangements (e.g., Arkansas' ceiling covers all loans, the Texas ceiling is different for business loans and mortgages, the Tennessee law is different for different initial loan amounts);

(2) to what extent loan terms are also covered under usury regulations (e.g., whether loan closing points, or compensating balance arrangements are included in the calculation of interest rates);

(3) whether some institutions or lenders may be exempt from the ceiling (e.g., banks are exempt under Connecticut law).

Such differences make an analysis of the effect of such a ceiling more complex. In general, of course, the less constraining is the law in terms of the above, the greater will be the availability of approximately equivalent lending arrangements from other non-constrained sources.

The Rationale for Usury Laws

There are three rationales put forth to justify the existence of ceiling rates on financial transactions. By far, the most oft-mentioned of these is one which argues that the markets for financial transactions are inherently non-competitive. Without true competition to set prices, at least some individuals will find themselves at a substantial competitive disadvantage. Generally, these individuals have a low elasticity of demand for the particular transaction, and often face lenders who have a good deal of local
market power. According to this argument, it is the local characteristics of the market for financial transactions, and the relative size of the demander of funds vis-a-vis the supplier of funds that creates the non-competitive condition. Given this particular market structure, lenders will attempt to set high rates to extract the maximum consumer surplus associated with the relatively inelastic demand for each individual borrower. The installation of ceiling rates on loans prevents the monopolist from extracting this consumer surplus, and consequently is a justification for the existence of usury rate ceilings.

To justify this argument, some have proposed that the low elasticity of demand represents borrower unwillingness or inability to seek alternatives to the proposed financial arrangement. In other words, it is often stated that the lack of financial expertise prevents the borrower from comparing alternatives that may be available in the market. Precisely why the demander of funds finds the financial market to be more confusing than the markets for other goods or services is never made clear. While it is probably true that there are a large number of financial market participants who do not understand the complexity of the financial arrangements available in our economy, it appears that this argument could be made for many goods and services markets. Moreover, it is not necessary that all market participants be knowledgeable for a market to approximate the competitive solution. If the interest rates on one type of loan tend
to be set uniformly, it seems reasonable to assume that close to competitive prices would be set as long as there were enough financially-sophisticated demanders of funds.

The other side of the non-competitive environment issue is formed from the assumption that financial markets approximate a natural (though local) monopoly. That is, if economies of scale are associated with lending processes, and if the loan market is one which is localized, then it may be appropriate to place restrictions on market entry which will increase the size of institutions, thus generating economies. If the efficient size is so large that a monopolistic market is created, then one needs also to restrict the price at which the monopolist can lend. The argument is similar to the justifications that underlie the public utility pricing process.

Each of these arguments has its basis in the assumption that the market for financial instruments is one in which efficiency is absent due to the lack of competition and the lack of freely available price information. In other words, the rationale proposes that the market solution would be inefficient. While it is, of course, legitimate to argue that the assumptions that underly the competitive market solution are not in existence, it is another to document that these deficiencies are present as a number of authors have proposed (Kawaja [22], Blitz and Long [7]) that most of the observational evidence suggests few reasons to expect financial markets to operate in a non-competitive manner. Indeed, the legitimacy of these arguments has
often been called into question because the lack of competition appears to be no more likely in the financial marketplace than in the markets for most other goods and services.

There are some other arguments in favor of usury ceilings that tend to be extraneous to the competition issue. These are political issues that do not involve an assumption that there is a breakdown in the market process. The two that are most often mentioned involve societies' mores. The first of these pertains to the idea that there is some natural rate of interest that should not be exceeded. Exceeding this rate of interest tends to have perverse effects on society, and control ought to be exercised to ensure that money lenders do not exceed this rate. A part of this argument is that the consumer needs to be controlled for his own good. That is, borrowers tend to overextend themselves for consumption. This is a natural tendency created out of our societal environment, and it is up to the political process to restrict the desire to over-consume. The usury law is one means by which this over-consumption can be controlled.

Possibly one of the most cogent arguments as to why we have usury laws is that they have been insisted on by segments of the public who feel that they will benefit from the imposition of a rate ceiling (Blitz and Long [7]). The argument rests upon the contention that if there is uniformity of rates across a type of borrower, it is entirely possible that money will be made available at a lower cost to middle risk borrowers if the usury ceiling is set at the appropriate level.
This is a means by which the middle risk borrowers can extract wealth from the low-risk and high-risk borrowers. In other words, the price of money to the middle-risk borrower would be below what it would be if the prices were set by free markets. Eliminating higher risk borrowers from the market by lowering the rate of interest will cause the effective rate of interest to middle-risk borrowers to be reduced. Perceiving this, the middle-risk voter forces the legislature to adopt restrictions that create a market structure in which they will benefit from a cap on interest rates. We deal with this issue to some extent in the theoretical section of this paper in attempting to identify some of the net effects of the imposition of usury rate ceilings in the presence of uniform pricing policy. The analysis follows the prior analysis that has been put forth by Blitz and Long [7], and Greer [17].

We now attempt to tie together this basic financial market restriction to the environment within which small businesses operate to provide a basis for a comprehensive discussion of the theory and empirics of usury.

**Distinguishing Features of Small Businesses**

Underlying our analysis is the consideration that small business operations differ in a number of important respects from other potential financial market participants, including both large businesses and consumers. It should be pointed out that these differences may or may not be relevant to the eventual effect of usury.
ceilings. In fact the enunciation of these differences serves as a focal point for our coming discussion. It is in that discussion that a determination will be made as to whether such differences are likely to hold any importance in the analysis of the impact of interest rate ceilings.

Owner-Manager Operated. Small business firms tend to be owned and managed by the same individuals or groups. Major decisions and firm policy are set directly by the owner or owners. These decisions include product line decisions, asset composition, and financial structure decisions.

Limited Capital Market Access. The size of the firm limits the ability of managers to portray to others the true risks and expected returns on the firm's operations. This limitation, termed information asymmetry, virtually excludes the firm from being able to enter the large public market for debt and equity ordinarily used by the nation's larger corporations. In part, this limitation stems from the registration (financial reporting) requirements set up by the SEC and by states to monitor this market, but it seems clear that the large fixed cost of operating in this market is also a primary limiting factor. These fixed costs include that of overcoming information asymmetries required for public trading of stock or bond issues of a company.

The implication of the restriction on direct entry into the capital markets is that small businesses must rely more on financial
intermediaries. These intermediaries reduce the cost of accessing capital markets by pooling capital, changing maturity structures, and producing diversification services. One way of viewing the existence of banks and other intermediaries, in fact, is that by resolving informational asymmetries, they reduce the cost of transacting in the capital market for some groups of borrowers over what it would be if direct participation were the only alternative. Clearly, small businesses fall into this group of borrowers, as do most consumers.

Limited Financial Experience. At least some small businesses would be expected to have limited prior contact with financial markets, and may lack general financial skills. While it is possible to hire expertise in this area it is often the case that potential suppliers of funds offer financial advice. Banks, venture capital groups, and even the SBA offer such advice to some extent. Undoubtedly, some managers of small business have considerable financial expertise and experience, though it is not unreasonable to anticipate that the level of financial skill probably matches that of the general consumer population within the same income strata, and falls substantially below the hired expertise available to larger organizations.

Limited Capital Intensity. Extremely capital intensive production processes require large fixed investment and, as a result, tend to find small businesses flourishing in the production of goods and services that do not require huge sums for investment in plant and
equipment. The implication is that proportionally less financing may be required from "permanent" debt and equity sources, and proportionally more required from "transient" sources such as trade credit, term loans, and lines of credit.

**Limited Geographic Range.** Few small businesses either hire their factors of production from or sell their goods and services to markets that are nationwide. There are exceptions for goods that can be inexpensively transported, but the markets tend to be local and geographically concentrated.

**Questionable Collateral Positions.** Small businesses must be considered to have questionable collateral positions. This is not to say that risk is greater than in large businesses (whether it is or not is dealt with later); rather that there may be less information available regarding the liquidation value of those assets that are held. Therefore, the cost of establishing the value of asset collateral may be quite high. In fact, it appears that personal loan guarantees or personal collateral is often substituted for business collateral as a way of overcoming some of these costs. The implications of this tendency for both the efficacy and efficiency of small business operations are dealt with to some extent in the following section.
II. THEORY

There are three ways that small business operations may be affected by the existence of price constraints on loans. The first is the direct effect on the business itself—impacting on the decisions made by small business management to facilitate meeting their objectives. The second is through the effect on the customers of small businesses. The effect pertains to restrictions on the ability of customers to secure financing that may be prerequisite to a sale. The third, of course, is the effect that occurs through the decisions made in financial markets and institutions that impacts on the availability of debt and equity funds to small businesses.

As is always the case, the expected impact of any constraint depends heavily on the nature of the environment within which decision makers operate. Our treatment of the usury law issue is founded on our concern for describing those environmental factors that will result in an impact on small businesses. Indeed, it seems to us that much of the existing literature, both conceptual and empirical, is confusing primarily because different studies make summarily different judgments regarding the state of the world. As we will point out, the expected impact of usury laws depends in great part on the existence of: (1) uniformity in pricing; (2) uniformity in risk; (3) segmentation of financial markets; (4) costly intermediation; (5) other price and quantity restrictions on intermediaries; (6) financial structure constraints of business firms; and (7) the existence of "agency" and "bankruptcy" costs.
To simplify the analysis, we treat each of the decision makers—the small business manager, the customer, and the lender or financial institution—separately. In each case we show the impact of the optimal decisions of these capital market participants on small businesses. The last part of this section summarizes these impacts in an attempt to develop a comprehensive statement that can be used in the interpretation of the extensive set of empirical studies considered in Section III.

Decision Model of the Lender

In financial markets, there are two types of lenders—the ultimate suppliers of funds and the financial institutions that intermediate between the suppliers and the ultimate user of the funds. Financial institutions exist because of the efficiency with which services are performed in this intermediation process. A variety of theories exist to explain precisely what intermediaries do, but the major contentions are that they are relatively efficient at: (1) the collection and analysis of information pertaining to borrower decisions and borrower risk (asymmetric information and incentive signaling hypotheses); and (2) the pooling and processing of fund flows and the transference of risk (the transactions costs hypothesis).

To discuss lender actions in the presence of ceiling rates on loans requires the construction of a model of a bank's (which we take to be the prototype financial intermediary) decision-making and the determination of equilibrium interest rates on loans.
A convenient model for purposes of analyzing the lending arrangement is given by Sealey [33] in a model derived from the assumptions that banks set deposit rates and face random deposit quantities, face explicit costs of operating as an intermediary, must insure institutional liquidity, and be risk averse (premium demanded for risk). Within this model, loans will be made up to the point at which the certainty equivalent marginal revenue from loans equals the sum of the marginal costs of the lending and of insuring institutional liquidity. Formally, the condition for optimality is

\[ E(R_L) - \gamma(\beta) = C_L(L) + P \]

where \( E(R_L) \) = the expected return on the loan, \( L \),
\( \gamma = \) the "price" of risk,
\( \beta = \) the loan risk,
\( C_L(L) = \) the marginal cost of the loan (a function of the amount, \( L \))
\( P = \) the marginal cost of liquidity created out of random deposit supplies and a need to maintain balance sheet equality.

In equilibrium, market rates will be set to compensate for risk, the costs of the loan, and liquidity costs of the lending arrangement. Moreover, in the complex financial arrangements that exist in financial markets there is much more "solved" for than just the nominal interest rate of the loan (which directly affects, but is not the same as, the expected return, \( E(R_L) \)). Indeed, loan contracts constitute complex schemes that include, in addition to
the rate of interest, the specification of collateral, maturity, compensating balances, other loan provisions, and the general asset base or earning power that conditions the borrower's ability to pay. These factors and others serve to set loan risk, $\beta$, cost $C_L(L)$, and liquidity needs, $P$, as well as the expected return, $E(R_L)$.

Viewed in this way, the interest rate on the loan contract can be thought of as endogenously set as a function of the characteristics of the borrower and certain characteristics of the loan contract itself. One simple, but useful way to view this process is in the implicit function $I$.

1This analysis is based on Smith's [37] attempt to formulate the value of the loan contract as an option. Essentially, the value of the loan to the lender is viewed as a contingent claim. This view is useful to specifying the sources of conflict that exist between borrower and lender, and thus, to understanding why and how loan terms are introduced into the financial arrangement. The equilibrium interest rate, defined in equation (2) above is derived from the contingent claim aspect of the loan instrument. The specification of the loan characteristics that are set simultaneously with the rate of interest has been the subject of a good number of prior investigations. Two of the earliest, yet most comprehensive attempts to formulate a model along these lines, were Guttentag's [18] study of credit availability and monetary policy and Muth's [26] observations on the direct connection between interest rates and other loan terms. Most of the literature developed subsequent to these has concentrated on the effectiveness of monetary policy within such a decision framework, and relatively little attention has been given to identifying the impact of regulatory constraints like usury ceilings.
and $r = r(V, D, M, S, \sigma^2, r_f)$

The equilibrium interest rate of a loan will be higher: (1) the lower is the value of the underlying assets (or earning power) of the borrower, $V$; (2) the higher is the amount to be repayed, $D$; (3) the greater is the period until maturity, $M$, given a variance rate for the underlying assets; (4) the greater is the rate of economic depreciation of the underlying assets, $S$; (5) the greater is the variance rate of the value of the underlying assets, $\sigma^2$; and (6) the greater is the risk-free rate of interest.

When properly viewed in the context of negotiation between the borrower and the lender, only the riskless interest rate is determined completely exogenously. All other variables, including, of course, the interest rate, $r$, are determined within the context of the loan agreement. Importantly, this loan agreement exists to resolve the conflicts that exist between the lender and borrower. A loan will be made by the lender if in the solution to equation (2), the
left-hand side of equation (1), the certainty equivalent marginal revenue, is greater than or equal to the right-hand side, the marginal costs.\(^2\)

**The Sources of Conflict Between Borrower and Lender.** If the lender takes as given the value of underlying assets, \(V\), the depreciation of those assets, \(S\), the variance rate, \(\sigma^2\), and the riskless rate, then the interest rate, \(r\), the amount of repayment, \(M\), can be set to compensate the lender for the risks undertaken and costs incurred. The problem, however, is that after the loan is made, the borrower has an incentive to alter \(V\), \(S\), and \(\sigma^2\) to reduce the value of the loan contract in ways that will increase the value of the equity position of the borrower. Such "me-first" types of activities include taking actions to reduce the amount of assets in the borrowers operations (e.g., the sale of assets and use of the cash for larger management salaries and prerequisites or dividends, or the investment of funds in subsidiaries or other enterprises owned by the borrower), actions to increase the variance rate of the underlying assets\(^3\) (e.g., by buying higher risk, higher return assets), or actions to

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\(^2\)Both equations (1) and (2) are useful to viewing the lending decision of a financial institution, though they overlap one another to some extent. Equation (1) sets the condition for bank equilibrium, and equation (2) specifies precisely those factors that will have an influence on the terms in equation (1).

\(^3\)Such actions would offer higher returns to the owners. But, since the creditors would not participate in these higher returns, the owners would confiscate their share as a result of being residual claimants.
reduce the claims of creditors on the existing assets (e.g., by issuing more debt with equivalent seniority). Essentially, the conflicts that arise out of the control the manager has over V, S, and \( \sigma^2 \) measure the "moral hazard" problem in loan markets.

**Resolution of the Moral Hazard Problem.** Of course, rational lenders, anticipating such debt value reducing activities of borrowers, would raise the nominal rate of interest to compensate for the anticipated wealth transferring activities of the borrowers. Moreover, rational borrowers, expecting higher rates, \( r \), given their partial control over V, S, and \( \sigma^2 \), may be willing to negotiate with the lender a set of restrictions on their control of V, S, and \( \sigma^2 \) to reduce the nominal interest rate, \( r \), below what it otherwise would be. In particular, consistent with the borrowers' attempt to maximize his own utility, a package of restrictive covenants may be set to provide the optimal loan arrangement.

Commonly, such restrictions include the use of escrow accounts, and compensating balances to attempt to maintain the value of assets and eliminate any other claims (tax liens). Also common is the prohibition on the sale or rental of assets, the designation of specific collateral, or the lender retention of title.

As one might imagine, the development of these complex lending contracts is costly.\(^4\) Monitoring costs are incurred in reviewing,

\(^4\)The primary cost is probably the auditing cost incurred directly by the borrower.
and processing costs are incurred in developing the loan contract itself. Such costs may be born directly by the borrower, or may be incurred by the lender and passed to the borrower through a higher interest rate.\(^5\) With positive costs it does not become optimal, in general, to resolve the entire moral hazard problem. Nevertheless, the loan contracts that exist are developed in view of the nature of the moral hazard problem and the costs associated with resolving it. Importantly, since such problems and their resolution involve setting the interest rate on the loan simultaneously with setting other parts of the loan contract, the impact of interest rate ceilings on small business must be considered within the context of this general model. The following sections show how the loan contract and loan availability would be affected with interest rate ceilings under a number of alternative assumptions regarding the operation of these markets. This approach serves to enunciate the impact on small businesses of rate ceilings in alternative market situations.\(^6\)

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\(^5\)The most obvious example of this is in the case of small consumer loans where the rate of interest is often higher (sometimes as prescribed by usury laws) on smaller loans. Benston [3] has studied the structure of the cost of lending function and found the processing and monitoring costs to be relatively fixed and independent of loan size.

\(^6\)The lack of a general approach, in fact, has rendered some prior analyses of the effect of ceiling rates to such a constrained world that they have limited value. The simple supply and demand analysis of Ostas [28] who assumes risk uniformity, and the uniform pricing scheme of Blitz and Long [7] are but two examples of the lack of generality in most prior theory.
The Unconstrained Case. When there are no restrictions on the types of loan contracts that can be developed in financial markets and when financial markets contain no imperfections, the marginal cost contributions from each portion of the contract will be equal. If the incremental cost to the borrower of supplying information to the lender of the asset structure (a monitoring cost—such as an audit) is greater than the incremental interest that would be charged in the absence of the information, then the loan contract would reflect the higher interest and lower level of monitoring. Optimal (least cost) contracting would characterize financial markets. Moreover, since the extent of the moral hazard problem and the costs incurred in reducing it are likely to vary both from one borrower to another and one lender to another, it is possible that loan contracts would be unique to the lending arrangement. Loan contracts are relatively easy to develop and are probably not very costly. Each loan would reflect the nature of the borrowers' assets and earning power, and the borrowers' ability to alter the asset and liability structure in ways that would diminish the value of the loan contract. Contracts would also reflect the administration and monitoring costs of the lender attempting to maintain its financial position.

Nevertheless, in some loan markets, because of the small size of the loan, or because the moral hazard problem is a relatively homogeneous one, standardized loan contracts may be appropriate. In these markets, loan covenants, monitoring arrangements and processing
costs, would tend to be the same. Undoubtedly, consumer loans, because of their small size, and mortgage loans, because the moral hazard problem tends to be fairly uniform, are characterized by more or less standard contracts. They do differ, however, and some loan terms and the rate of interest vary with different borrowers.

For small business loans, however, it is not likely that uniformity would characterize the market. The potential for asset or financial structure alterations clearly varies from small business to small business.\(^7\) Collateral and earning power differ markedly. As a consequence, optimal contracts would vary from loan to loan, depending on the marginal costs of each component of the contract. Some contracts may have higher interest rates and fewer other restrictions, others may have precise collateral arrangements and low rates. Still others may have little collateral, but significant monitoring efforts. The following subsections analyze the effect of usury laws in general, and as they would specifically impact on small business loan markets, under a number of different assumptions about the breadth of rate ceilings and institutional lending arrangements.

**The Case When Ceiling Rates Apply Only to Part of the Lender's Portfolio.** Imposing rate ceilings on some loan markets will affect both the nature of the loan contract and the availability of

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\(^7\)For example, some firms have assets that are generally fixed and immovable, while others hold inventories, accounts receivable or cash that are readily marketable.
loanable funds. The magnitude of the effect will depend on where the rate ceiling is set. If ceilings are set so that some (formerly) optimal contracts are ruled out, there will be two results. First, lenders and borrowers will attempt to revise loan arrangements to reduce both the extent of the moral hazard problem and risk. Contracts will change according to the specification given in equations (1) and (2), such that the revised contracts will tend to:

- require greater collateral, assets, or earning power, for example, by requiring a larger commitment of owner personal assets,
- reduce the amount of the loan, D,
- shorten the repayment schedule, M,
- expend more on administering and monitoring to reduce the moral hazard problem, for example, by reducing the flexibility, management has to change assets or liabilities.

By definition, these revised contracts would be viewed by the borrower as more costly, and demand for them would go down. Second, lenders will tend to shift to other financial markets where the lack of restrictions allows the development of optimal least cost contracts. This, of course, reduces the availability of loanable funds to the restricted markets. Other regulatory prohibitions affect the degree to which funds can be shifted. Specialized financial intermediaries are severely restricted to specific markets in which

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8 A number of studies have argued that the cross-elasticity of supply of loanable funds is quite high. Among these is Alberts [1].
they can invest. Commercial banks are somewhat restricted. Consequently, the effect of ceiling rates on loan availability is likely to vary with other regulations.

Relative to consumer loans and mortgages, where the institutional structure has instilled a good deal of uniformity in the contract, small businesses and their lenders would tend to have greater freedom to change the loan contract. This greater level of flexibility helps to insulate small businesses from a decline in credit availability induced by rate ceilings by allowing for more changes in the characteristics of the loan arrangement.

As the rate ceiling is lowered and made more binding, the problem is exacerbated. Loans become more costly to create, reducing both the demand for and supply of loans. High risk loans and loans with high costs of reducing the moral hazard problem will be eliminated first. Conceivably, as the rate ceiling is lowered further, the loan contract may become so costly that lender supply would be virtually eliminated. It is not novel, of course, to point out that the supply of loans would be reduced under usury laws, but the framework developed here does point to specific changes. In particular:

- the complex loan arrangements that exist provide a mechanism to undo the ceiling constraint by a revision of other terms and covenants,
- that undoing the constraint is likely to be costly,
- that both the risk and cost of resolving the moral hazard problem will play a part in determining whether contracts will change and in what way, and, therefore,
that the imposition of a rate ceiling has a "degree of magnitude" rather than "an all or nothing" effect on the volume of lending both by a lender and to a specific borrower.  

The effect of rate ceilings on loan supply functions with heterogeneous risk borrowers is an issue that has been studied. Both the Blitz and Long [7] and Greer [17] studies provide useful conceptual treatments of this issue. Nevertheless, the assumptions that are made in these studies, being somewhat restrictive, cast some doubt on the generality of their results. Blitz and Long, for example, assume that a lender cannot shift to unregulated markets, that borrower demand is inelastic, and that the lender acts as a price-discriminating monopolist attempting to extract the maximum consumer surplus. Greer's analysis is similar, though he considers the competitive lender solution as well. Neither of these conceptual treatments allows for the adjustment of non-interest rate credit terms or conditions, though both allow for a distribution of risk classes of borrowers. Risk is the discriminatory factor in both analyses.

Regardless of the analysis used, however, it is clear that the magnitude of the effect on the nature of loan contracts and on the volume of lending will be conditioned by the cross-price elasticity of demand and supply. If borrowers have substantial financial

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9This last point has empirical relevance. It suggests that a binding/non-binding usury law dummy variable as an explanatory variable is probably not a proper specification for an equation used to estimate how credit availability change with changes in ceiling rates.
alternatives and lenders have a variety of different lending alternatives, the effect on loan volume in the market constrained by ceiling rates will be great, but the overall effect on the borrower and lender will be small. They will simply move from the constrained market to an unconstrained market.

The Case When Ceiling Rates Apply to the Entire Loan Portfolio. There is an important difference in the eventual effects on both borrowers and lenders if ceiling rates apply to the entire portfolio of lender financial arrangements. In this situation, the inability of lending institutions to switch to other loan categories would put different pressures on the values of variables in equations (1) and (2), thus creating different results. First, more effort would be placed on revising loan contracts to allow a reduction in the stated interest rate, r. Second, these revisions, which increase the cost of the loan contract, tend to force down the value of the left-hand side of equation (1), and force up the right-hand side, making some loan arrangements with some borrowers unprofitable. These potential borrowers would be eliminated from the market for loans. As in the prior case, they would tend to be high risk, high moral hazard borrowers.

However, because of the lack of alternative lending arrangements due to the comprehensive nature of the usury law, loan volume initially may not fall by as much as when usury ceilings were more limited in scope. This is a point that is often made by proponents of usury
laws. However, the analysis that leads to this conclusion is partial and incomplete. Eventually, the downward pressure on profits per loan for high risk/high moral hazard loans reduces overall profits to lending institutions, and makes them less able to compete in the markets for funds (deposits) they must raise to finance the loans. The net result is a lower volume of intermediation and less lending.

In the end, whether the percentage reduction in the total volume of lending when usury ceilings span all markets is greater than or equal to the percentage reduction in total volume when only one category is constrained depends on:

- other borrower alternatives in non-constrained markets
- whether excess profits are present (whether monopolies exist) in the intermediaries that are constrained, and
- how competitive the market is for intermediary funds (whether monopsonies exist).

In general, because of the easy transportation of money, most analysts believe that the markets for intermediary funds are competitive. Consequently, the effect of comprehensive usury laws on the volume of lending hinges upon the degree of competition among

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10Regulation Q has restricted rate competition for consumer deposit accounts, but competition in other forms (convenience) and competition for unregulated funds is intense. The argument has been made, however, that usury laws on loans, in combination with Regulation Q, effectively reduce the cost of borrowing without severely affecting volume. For this argument to be valid would require an extraordinarily segmented financial marketplace.
intermediaries in loan markets and (which is part of the same thing) the availability of borrowing alternatives. The greater the competition among institutions, the lower the profit and the more loan volume will drop when ceiling rates become constraining. Similarly, the better are borrower alternatives, or the more integrated are financial markets, the greater will volume fall in this market, though the brunt of the effect will be on the intermediaries, not on the borrowers.

How small businesses are likely to fare in these circumstances is an empirical question. Undoubtedly, they would tend to see some change in loan terms and arrangements--including a reduction in the size of the loan. The more risky or more costly would be eliminated. If small businesses tend to be constrained to only commercial bank borrowing, and do not have access to other loanable funds markets, the effect on them is likely to be quite significant. The effect on the lender, however, is likely to be even greater. In any case, under these conditions, both sides to the loan arrangement would be harmed. Clearly, the availability of a viable equity market for small businesses, as fostered by SBICs or venture capital groups would tend to ease this pressure. The reaction of the small business borrowers in this situation as analyzed is included in the next section--The Small Business Decision Maker.

Rate Ceilings With Uniform Rates. The argument has frequently been made that financial institutions charge uniform rates for a given
type of loan, and discriminate between potential borrowers on the basis of risk and cost considerations. While such arrangements may seem inefficient, in view of the model of bank lending suggested previously, it is possible that such a pricing structure may reduce bank operating costs for certain types of loans. Whether uniform pricing is efficient or inefficient would depend on the perceived variation in risk and moral hazard across the institution's customers. Wide variations would make such a policy very inefficient.

Small businesses would seem to epitomize the case of wide variations in risk and moral hazard. Certainly, wide variations in business experience, products, production technologies, and existing financial structure render the small business loan market a diverse one. Consequently, uniform pricing is expected to be less prevalent than in the home mortgage loan market and in some consumer loan markets.

In spite of its apparent lack of relevance to the small business loan market, it is important to understand how the impact of rate ceilings may be different in a case of uniform pricing. That this is

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11 That is, in equation (1), C'(L), may be lowered with the adoption of uniform pricing and loan terms.

12 Variations may result in a certain level of institutional specialization. Some lenders would concentrate on making high risk/moral hazard loans at high rates. Other lenders would specialize in a different part of the market. Within this structure, rate uniformity might characterize each lender, but not the entire market.
important is due primarily to the fact that most empirical studies are of mortgage and consumer loan markets, where the existence of uniform pricing affects our ability to translate results to the effect on small business loan markets. Uniform rates and other loan terms imply bank pricing according to equations (1) and (2) on an aggregate basis. The net effect of such a pricing scheme would be to over charge on low risk/low moral hazard loans and under charge high risk/high moral hazard loans. On average, marginal loan returns adjusted for risk equal marginal loan costs.

As rate ceilings are made more severe, the high risk borrower is eliminated from the market. However, the reduction in (uniform) interest rates may benefit the middle risk borrower—essentially by transferring a portion of the consumer surplus extracted from the low risk borrower that was formerly going to the high risk borrower. 13 Moreover, as the regulation forces rates down (uniformly), all loan terms will be (uniformly) revised in view of the constraint on \( r \), according to equation (2). Collectively, high risk borrowers will be eliminated from consideration until marginal revenue no longer exceeds marginal cost, according to equation (1). The borrower with moderate risk and moral hazard who continues to be funded under the ceiling rate will be better off than under a competitively-determined pricing structure.

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13 This is the point made by Blitz and Long [7].
This analysis provides one argument why some borrowers—low- and moderate-risk and moral hazard customers—would view usury laws with some enthusiasm. In the presence of uniform pricing, it provides them with the opportunity to capture some of the wealth previously transferred to high risk customers. It is important to understand that this argument depends heavily on the presence of uniform pricing, for without uniformity, the wealth transfers to high-risk borrowers would not occur. On the face of it, it seems odd that uniform pricing in any loan market would be sustainable, unless the risk of all borrowers is equal, since low risk borrowers would have a strong incentive to seek loans from some other source where prices are set in accordance with the marginal costs and risks of the low-risk group. That is, market forces would work against the maintenance of uniform prices, and this argument for the establishment of rate ceilings would be negated.

The Relevance of Banking Relationships. In a world where there is some possibility of sequential loan arrangements between the same borrower and lender, decisions will reflect long-term marginal revenues and costs. These revenues and costs may span more than one loan arrangement, and, consequently, decisions with regard to the granting of a loan this period reflect the anticipated profits from future lending agreements. The reasons why these lending decisions are not made independently is because of an informational asymmetry. At the point where the second loan decision is being made, the lender
has some unique information on the risk and moral hazard characteristics of the borrower, and the borrower is able to avoid the cost of transmitting this information to another potential lender. Traditionally, the term for these pressures has been labeled as "banking relationships."

Without detailing a multi-period lender objective function, it is difficult to be specific about the effect of such relationships. Nevertheless, it seems fairly clear that there is an incentive for the lender to continue to supply near-term funds under rate ceilings when there is a possibility that rate ceilings will be above equilibrium rates in some future period.

This does not imply that small businesses or any other borrower would benefit from rate ceilings. What is lost to the bank through artificially low interest rates this period would be made up for in the future period. Borrowers would be prevented from switching to a less costly loan in the future period by the costs of overcoming the informational asymmetry that favors the first period's lender.

One net result of the existence of banking relationships is that the availability of funds would not be expected to drop as much with binding rate ceilings. Some loan arrangements would be maintained in spite of the inability to justify the loan on the basis of current marginal revenues exceeding or equaling current marginal cost.

Viewed from the perspective of different borrowers, it would seem that banking relationships would be most influential in the case of
large business loans. They would be somewhat influential in small business loans, and of little consequence for mortgage and consumer loans. Since most of the existing empirical studies are of mortgage and consumer loans, the results of these studies would tend to overstate the effect of rate ceilings on loan availability vis-a-vis that existing in small or large business loan markets.

**The Small Business Decision Maker**

As a basis for discussing how the decisions of small business firms would be impacted by rate ceilings, we develop a simple model under the assumption that the owner-manager attempts to maximize the owner's expected utility. The owner is assumed to have such a direct impact on the operations of the firm that, even if the manager is another individual, it is possible to imbue the manager with the owner's utility function. In attempting to maximize expected utility, the manager makes production decisions—including the kind any quantity of goods or services to produce and factors of production to employ—investment decisions, and financing decisions. Formally, the model representing this process is given by,

\[
\text{MAX } \mathbb{E}(U) - U(\ldots)
\]

\[
\{P, I, F\}
\]

where \( \mathbb{E}(U) \) = is expected utility,

\( P \) = production decisions,

\( I \) = investment decisions,

\( F \) = financing decisions, and

\( \ldots \) = the arguments of the owner-managers utility function.
One of the arguments undoubtedly included in the owner-managers utility function is firm wealth. Consequently, an optimal investment decision process derived from the above would have the general form,

\[ NPV = \sum_{t=0}^{n} \frac{E(X_t)}{(1+r)^t}, \]

\[
\begin{align*}
\text{if } NPV < 0 & : \\
\text{accept investment opportunity} & \\
\text{indifferent} & \\
\text{reject investment opportunity} &
\end{align*}
\]

In this formulation, \( E(X_t) \) is the expected monetary equivalent of the cash flows incrementally generated by the investment opportunity before interest after taxes and the increment or decrement in utility associated with the acceptance of the project.\(^{14}\) The variable \( r \) is a composite discount rate reflecting the component opportunity costs of both debt and equity sources of funds. These component values are market-determined rates that compensate for both time and risk. Usury ceilings can have an effect on these decisions through the cost and/or availability of financing, which has, in turn, an impact on optimal investment and production decisions. This section traces the effect through under a number of different assumptions regarding small business managers' preferences for debt capital.

\(^{14}\)One would have to assume that in the ordinary case, the cash flow portion would dominate the elements contained in \( X \), since, if this were not the case, the eventual "profit" earned by the operation of the small business will disappear. If this happens, of course, the small business will eventually disappear.
The Preference for Debt Capital. There are two basic forms of financing, debt and equity, that underlie all of the complex forms of financial instruments existent in our economy. Equity, for the small business, may consist of the owner-managers contributions, retained earnings, or equity raised externally. Debt may be involved in the issuance of securities publicly or privately, bank loans, trade credit, or leasing, among other things.

In a world of no transactions costs or taxes, when each market participant is a price taker and all participants have equal access to price information—that is, in a world of perfect capital markets—the financial structure of a firm does not influence its value. The lack of any relationship between debt and value implies that the cost of financing would not vary with change in the proportion of financing from debt and equity sources of capital. Equity could be easily substituted for debt with \( \hat{r} \), the cost of funds, remaining constant. Since the cash flows are defined before interest, an \( \hat{r} \) invariant to the financial structure implies that investment decisions would not be influenced by whether debt or equity are used to finance the expenditures required to purchase the investment opportunity.

In this simple world, the unavailability of debt source of funds would be costlessly offset by the use of equity funds (either supplied by the owner-manager or someone else). If debt funds flowing to the capital market were restricted, reduced or made more costly, by the imposition of an effective ceiling rate, there would be an equivalent
increase in the volume of non-restricted equity and the total costs of financing and financing availability would be unaffected. In effect, perfect substitutes exist for the constrained source—offsetting any effect of the constraint.

The situation possibly could be different as the original set of restrictive assumptions is relaxed. To make the environment a bit more realistic, suppose that there are explicit costs associated with the process of intermediating between suppliers of capital and demanders of capital. In particular, suppose that transactions costs exist that made it profitable for banks, investment bankers, and other financial institutions to exist to intermediate between the ultimate suppliers and demanders of financial capital. In this case, a restriction on the price of funds that inevitably reduces the available supply will force small businesses to seek additional financing elsewhere. If the new intermediation process required by this shift results in any additional transactions costs, then the small firm will be forced to pay for these costs either explicitly, or through a higher interest charge or lower price for equity. In either case, $E(X^t_e)$ will be lower or $r$ higher with a resulting reduction in the present value of investment opportunities and a diminution of small business investment.

How significant this effect is likely to be depends on the size of the new transactions costs incurred. The costs would be less to the

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15 These institutions exist because they are relatively efficient at reducing the cost of intermediation.
extent that information regarding the firm's operations and financial soundness can be "transported" from one financial market to another. Thus, if potential suppliers of alternative debt and equity funds are willing to use the same set of information in assessing risk and moral hazard and in setting demanded returns, the marginal costs would be quite small and the small business again would find itself in the position of having nearly perfect financial substitutes available if one source were restricted as a result of binding ceiling rates.¹⁶

On the other hand, if a different set of information were required--and there is certainly reason to expect that different types of creditors (bank and lessors, for example) and equity suppliers require different information--then these costs may be significant. In the case of the small business seeking funds from external equity sources, in particular, SEC registration requirements and state "Blue Sky" laws make the transactions cost incurred by the small business particularly large. By any reasonable set of assumptions, the location of such capital by a small firm may run upwards of 20 to 40 percent of the value of the proceeds of the issue. In this case, of course, the available substitutes are quite costly, which may have a rather significant negative effect on the present value of investment opportunities leading to a restriction of investment by the small firm.

¹⁶Clearly, Dunn and Bradstreet-type services reduce these marginal transactions costs by fostering the use of a uniform set of financial information by all potential suppliers of funds.
Tax Induced Preference for Debt. Financial theory has long argued that the tax deductibility of interest payments on firm debt creates a valuable shelter. This tax shelter effectively reduces the marginal cost of debt capital below that of equity creating a preference for debt financing. As debt is used more and more in financing, the marginal costs of debt begin to rise as bankruptcy costs increase. At some positive level of debt financing the cost of funds is minimized (or equity value is maximized). This is the firm's optimal financial structure.

The existence of ceiling rates on debt financing instruments available to the firm will tend to affect both the availability of that form of financing and the cost through an effect on the non-interest characteristics of the debt. Both the increase in the cost of the debt, and the change in credit availability will have an impact on the cost of capital and, thereby, on the level of firm investment. This change, due to the imposition of interest rate ceilings, is described in Figure 1.

How significant the increase in the cost of funds is (from $\hat{r}_0$ to $\hat{r}_2$) depends on those factors outlined in depth in the section on lender decisions, and is summarized here as follows:

1. the breadth of coverage of the rate ceiling,
2. competition in the market for funds and the cost of transacting in financial debt markets,
3. uniformity in pricing loanable funds, and
4. moral hazard and risk of the borrower.
In Figure 1, \((D/E)^*\) represents the optimal structure. A restriction on credit availability due to ceiling rates moves the firm to \((D/E)_1\), and a cost of capital of \(r_1\). A change in the nature of debt instruments due to ceiling rates (greater monitoring, shorter maturity, etc.) moves the firm to a new higher curve and a cost of \(r_2\). The effect on the level of investment of these two changes for a given marginal efficiency of investment is summarized in Figure 2.
For the small business that has only very limited sources of debt financing and is perceived to have high risk and high moral hazard, the result is likely to be drastic. In effect, the elimination of any credit alternatives moves the borrower to the intercept in Figure 1, with a cost of capital of \( r_e \). The small business is required to finance all projects with equity (retained earnings, new owner equity, etc.). At this point, the cost of funds is very high and there is a substantial reduction in the level of small business investment. By definition, larger firms or small firms that have numerous sources of debt capital would not suffer a similar fate. It is important to realize that it is the high risk/moral hazard borrower who would be most affected. This borrower would be affected either in the case of uniform rates or a variable pricing scheme. In addition, there is no reason to suggest that the elimination of this borrower is socially more or less desirable than the elimination of a lower risk/moral hazard borrower.

**Inability or Unwillingness to Issue Equity.** Small businesses are often characterized both as being unable to access external equity markets and as being unwilling to dilute the ownership claim. In those cases where the equity alternative to debt financing simply is not considered as a viable choice, then the effect of interest rate ceilings is magnified. Since equity cannot be substituted, a dollar reduction in credit availability reduces investment expenditures by a
full dollar. The level of investment undertaken by this firm is represented in Figure 3.

Figure 3

**OPTIMAL INVESTMENT**

Cost of Capital

I\(_R\) is the level of investment financed from retained funds in the absence of either external debt or equity. The total loss in value in this most extreme case is indicated by the cross-hatched area. The section of this area r-a-b\(_e\) is due to the rate ceiling, and the section b-d-c is due to the inability or unwillingness of the firm to seek external equity financing.

17 Perhaps, more correctly, by a full dollar once internally-generated equity is used up.
The Consumer Decision Maker

The cost and availability of credit to consumers or businesses can affect the demand for the goods and services produced by business organizations. In the same way that small businesses are affected through the cost and availability of funds, consumer and business demand will be affected. While this effect is indirect, a kind of induced restriction on demand, it is no less effective, and is similar in nature to the effect on small businesses borrowings.

As usury ceilings become binding, high risk and high moral hazard loan arrangements will be the first to disappear. How rapidly they disappear depends on both the elasticity of demand for these loans, competitive conditions in the market that supplies the restricted loan type, and whether the financing comes from the small business itself or from a financial intermediary. Moreover, the general availability of alternative sources of loanable funds will play a big part. Rate ceilings will substantially repress demand when demand for the product is elastic, when the level of lending competition is relatively low, when the loan arrangement is with a financial institution, and when alternative fund sources are not generally available.

18 Whether the loan arrangement comes from the business itself or from another intermediary may be among the most important of the factors affecting demand. The business lender has a tie-in sale arrangement giving some flexibility in offering a below ceiling rate loan and recouping the below market rate with a higher charge for the good or service sold.
Loan risk and moral hazard are likely to vary substantially between types of consumer or business loans. As a consequence, there would be every expectation that the effect on demand for the firm's goods or services would vary from one type of small business to another. While it is difficult to generalize, there are some obvious implications. Loans for the purchase of consumer durables where secondary markets are thin or non-existent (e.g., furniture, appliances, deteriorating apartment complexes) would be cut quickly as binding rate ceilings appear. Loans for business equipment (e.g., office furniture, equipment and machines) would probably not be viewed as containing as much risk and moral hazard, though, of course, the elasticity of demand for business equipment may be quite high. Trade credit financed by the small business in restricted markets would be cut markedly unless pricing schemes could be developed to undo the interest rate restriction.

There have been some recent change in financial markets which would tend to negate this effect for at least some types of small businesses. The existence of automatic credit lines and bank cards with lines of credit effectively create alternatives for financing the purchase of consumer durables. Thus, if credit availability for consumer purchases falls as rate ceilings are made binding, consumers can substitute these other loan arrangements that are already in existence. The cost of doing this may not be zero (if the rate on the bank card loan exceeds the free market rate on the consumer loan, for
example), but it will negate a portion of the effect of the ceiling on consumer loan demand.

There is no reason to expect the larger firms would be insulated from this pressure. Whether large or small firms tend to be most hurt will depend more on the institutional method of sale than the size of the firm. Goods and services that depend heavily on the ability of consumers or businesses to arrange financing (residential construction, auto sales) would be most heavily affected. It would seem that such an effect would be likely to affect particularly large and small businesses, but we see no reason to expect such effects to be more heavily concentrated in the small business segment of the economy.

**Predictions of the Theory**

**Loan Contracts and Terms Will Change.** Rate ceilings will result in a reformulation (or renegotiation) of loan terms in an attempt to reduce risk and moral hazard. One obvious result will be that less will be loaned on any given set of assets. The reformulated contract will be more costly. Moreover, the lower loan size will reduce debt financing from its optimal level thus increasing the cost of funds. The net result is a higher cost of financial capital and a lower incentive for further investment. The magnitude of the effect on investment will depend on firm preference for debt capital, the availability of other debt or equity substitutes, and the level and shape of the marginal efficiency of investment function.
Credit Availability to High Risk/Moral Hazard Borrowers. Rate ceilings will most adversely affect the supply of credit to high risk/moral hazard customers. They will be the first to be denied credit. The rationing of credit along these lines will severely affect the investment levels of these borrowers. How severely they are affected will depend in great part on the willingness and ability of borrowers to find other debt or equity substitutes. Small businesses and consumers would more than likely find it more difficult to find adequate substitutes.

Credit Shifts. The increased cost and lower return from constrained markets provides an incentive for lenders to shift loanable funds to unconstrained markets. The extent of such shifts will depend on the inclusiveness of the rate ceiling, the regulatory structure, the ease and cost of entry into financial markets, and the degree to which rate ceilings are binding. Such shifts may severely affect small business borrowers of alternative fund sources and are generally unavailable or available only with significant costs. This puts the firm in a credit rationing position and a major reduction in investment level occurs. Profitable opportunities are foregone.
III. EMPIRICAL RESULTS:
THEIR APPLICABILITY TO SMALL BUSINESS OPERATIONS

The presentation of evidence on the effect of interest rate ceilings follows closely the hypothesized effects of rate ceilings on lenders, the small business borrower, and the consumer-business demander. The contentions of the theoretical section were summarized in closing the last section. That summary also serves as a basis for our summary of the empirical studies of others.

We begin by presenting evidence on how financial intermediaries react in terms of (1) credit availability for high risk/moral hazard borrowers (which has relevance for the small business directly, and through its affect on demand for goods and services), (2) loan terms and conditions, (3) credit availability of particular class of loans (or the intermediaries' incentive to move to unrestricted markets), and (4) overall credit availability--the volume of intermediation. We then consider those studies that have investigated whether or not there are any impacts on the small business firms' investment and overall level of business activity. We end by considering a limited number of studies that have investigated how consumer or business demand may have affected small businesses through their inability to get credit in the presence of rate ceilings.

Evidence on the Effect of Rate Ceilings on the Availability of Credit for High Risk/Moral Hazard Customers

A basic contention of the theoretical literature on the impact of rate ceilings is that, if credit is restricted, high risk borrowers
will be the first to be denied (Blitz and Long [7], Greer [16]). The theoretical discussion presented earlier also has shown that the moral hazard problem (and its costly resolution) will have an impact on equilibrium loan rates, and will, thereby, affect the decisions of financial intermediaries to grant or deny loan requests, evidence of the magnitude of this relationship could come either from an analysis of the loan portfolio of the lender or from an analysis of the loan proposals of potential borrowers denied credit. If rate ceilings are binding on the intermediary, the risk and moral hazard characteristics of loan arrangements and loan customers both in and not in the lender portfolio should be fundamentally different. Moreover, the more binding is the ceiling the more likely it is that a given borrower will be excluded from the lender portfolio.

Specifically, evidence on the availability of credit for high risk/moral hazard borrowers would be expected to come in the following forms:

(1) lenders facing lower ceiling rates would experience lower losses on their portfolios,

(2) lenders facing lower ceiling rates would reject more loans given the loan application pool,

(3) the average characteristics of rejected customers would be different for institutions facing lower ceiling rates, and

(4) lenders facing lower ceiling rates would tend to offer only loan types that, by their nature, eliminate some of the moral hazard (e.g., collateralized loans only, such as new cars, houses, marketable equipment).
Formal investigations of these issues have taken place over a long period of time, often with data and econometric techniques that have contained major deficiencies. Moreover, virtually all of the studies were performed with observations from the consumer finance segment of the financial markets. While it is probably true that there are a number of similarities between this market and the market for small business loans, it is also clear that, since the size of the average consumer loan is very small relative to the small business loan, the enormous problem of the high cost of making consumer loans makes these data more difficult to analyze. These caveats should be kept in mind in interpreting the results and their applicability to small business borrowers.

**Portfolio Loan Losses.** Three initial studies (by Goudzwaard [13], Kawaja [22], and Shay [36] of the consumer credit industry noted a large positive correlation between average revenue per dollar of loan received by a sample of consumer finance companies in different states and credit loss expenses per dollar of loan. Under the assumption that these firms charged the maximum allowed rate, the authors of these studies concluded that this was strong evidence of the fact that lower rate ceilings mean high risk customers are being rejected. Goudzwaard, for example, found that in the eleven states with the highest ceiling, the average revenue figure was 30.6 percent and the bad debt loss was 3.8 percent. For the ten low ceiling rate states, the figures were 20.5 percent and 2.4 percent. In his regression
results, including 32 states where the sample firms operated, the partial correlation (holding loan size, lender concentration and per capita income constant) was .69. Shay [36] in his original study, and in a second study attempting to solve the problem of confounding size limits on consumer loans found very similar results.\(^{19}\)

There are some fairly obvious problems with the use of this relationship and these variables to imply conclusions about credit availability to high risk/moral hazard borrowers. The use of credit loss rates as a proxy for credit availability in a cross-sectional regression will be deficient unless credit losses are statistically unrelated with the geographic area of the country in which higher or lower ceiling rates exist.\(^{20}\) Even more concern exists over the assumption that the average revenue per dollar of loan correctly ensures the incidence of ceiling rates. Do consumer financial companies actually charge the ceiling rate?\(^{21}\)

\(^{19}\) Almost all states that have ceiling rates allow the ceiling rates to rise as the size of the loan falls. Thus, providing the lenders with a mechanism to partially undo (through multiple smaller loans) the rate ceiling constraint. As a result, the effect observed is potentially confounded by different ceiling rates for different loans.

\(^{20}\) In fact, the East Coast states tended to have the most restrictive ceilings during the time of Goudzwaard's study.

\(^{21}\) Acceptance of the assumption seems also to imply the acceptance of the assumption that consumer finance markets are highly monopolistic, and that consumer demand is highly inelastic.
Smith [39], at least, supplies some evidence that, at commercial banks, the relationship between rates charged and ceiling rates on consumer loans is weak. If the relation is weak at banks, it would seem reasonable to conclude that it is not extraordinarily strong at consumer finance companies (though it could be stronger if banks and consumer finance companies segment the market by risk). Such an observation substantially weakens the conclusions that can be gleaned from the relationships offered by these studies.

In a more recent study, Benston [5] looks at this issue anew. In a study of 120 finance companies classified by state of operation, Benston found a positive (though not highly significant) relation between net loan losses and the mean interest rate ceiling in the state of operations. That is, companies operating in states with high ceilings experience larger loan losses. Benston, however, went on to analyze one company operating in eight states. No relationship between losses and ceilings was detected. This suggests that individual lenders may tend to "manage" loan risk instead of interest rates in the presence of differential borrower risk, by, say, reducing the loan size. Benston's two conclusions then suggest that in low ceiling rate states credit availability is reduced both through greater loan request turndowns and by reducing the amount of the loan. Such an observation is, of course, totally consistent with the behavior of lenders modeled in Section II of this paper.
Loan Applicant Rejection Rates. Additional evidence on the issue of credit availability to high risk/moral hazard borrowers is given in analyses of loan turndown data. Goudzwaard [15] regressed loan turndown rates of two major finance companies operating in 27 and 41 states on a number of variables and a rate ceiling variable. Once again, the rate variable used was the average revenue per dollar of loan. No relationship was detected. This is not surprising given the use of revenues per dollar of loan as a proxy for the actual ceiling rate.

A more comprehensive study by Greer [16], however, comes to the opposite conclusion. He regresses loan application rejection rates on the mean legal ceiling on personal loans, on a measure of the diversity of rates within a state, and on measures of competition in the state. The data comes from three large finance companies operating in 47 states. The ceiling rate variable was incorporated as a reciprocal so the variable can be interpreted as kind of "price limit" of the loan, with higher values being associated with lower ceiling rates, and, therefore, with higher rejection rates. Though the results are difficult to interpret, due to the inclusion of a number of variables that are correlated with the ceiling rate variable, the association seems to be a positive and significant one. 22 The

22 While the coefficient has a t-value of only 1.2, the regression contains three other variables that, in part, also contain the ceiling rate variable (the product of the ceiling rate variable and three of the control variables). Judging by the results of the variety of regression expressions a more reasonably specified model would give a "somewhat" significant value to the coefficient on the ceiling rate variable.
strength of the relationship is higher for a subset of states that have low ceiling rates.

There are problems with the rejection rate approach, of course. In low ceiling rate states, more potential borrowers may be "informally" rejected prior to an evaluation of the application. Moreover, knowledge of the ceiling rates existence may reduce inquiries from those demanding funds. Both of these arguments would suggest that Greer's regressions would have understated the effect of ceiling rates on credit availability to high risk and moral hazard consumers.

Characteristics of Rejected Customers and Loan Types. In a study of Maine's 36-month rule—that imposed a severe 8 percent restriction on loans over 36 months—Eisenbeis and Murphy analyzed the characteristics of rejected loan applicants (almost all of them) who subsequently sought loans from other institutions. This study is unique in that the observations constitute individuals who are known to have a demand for funds. It overcomes some of the problems of "informal" rejections or constraints on borrower demand that have plagued "rejection rate" studies. If one hypothesized that lenders discriminate on the basis of risk under rate ceiling constraints, then one would expect that those customers who subsequently were able to get loans would have characteristics suggesting lower borrower risk.
In fact, Eisenbeis and Murphy were unable to discriminate between the borrowers who subsequently received credit and those who did not receive credit based on variables usually incorporated into applicant scoring systems (e.g., telephone, salary, marital status, own home). The only discriminating variables were whether the borrower had alternative financial institutions with which they had done business, and whether the purpose of the loan was to buy a car (secured) or not.

Importantly, while these discriminating variables suggest little about borrower risk, they say a great deal about the size of the moral hazard problem. One could reasonably presume that certain loan uses that may secure the debt more effectively would reduce moral hazard. Also, it seems reasonable to argue that the existence of a "relationship" with one or more financial institutions would have implications for the cost of making the loan and the assessment of moral hazard (the institution "knows" the customer) that would favor specific borrowers. Consequently, we take the Eisenbeis and Murphy study to suggest that loan availability is restricted when the lender perceives moral hazard to be high. Their study does not suggest an equivalent type of discrimination on the basis of risk, however.

Smith [39] found little relationship between the percentage of commercial banks' personal loan portfolio in unsecured loans and the ceiling rate. This result seems to be evidence that is somewhat contrary to that of Eisenbeis and Murphy—using a substantially different methodology.
Borrower quality in high- and low-ceiling rate states was tested by Goudzwaard [14]. He found few differences between the borrower characteristics of 800 consumer finance company borrowers in the three pairs of states. The data were collected from four firms. The inability to distinguish between borrower characteristics in high- and low-rate states is consistent with the hypothesis that consumer finance companies do not allocate credit according to borrower risk. It is, therefore, consistent with the Eisenbeis and Murphy study, but is generally inconsistent with prior results on rejection rates and loan losses, and with Benston's [5] more recent study.

Summary. These results, all coming from analyses of the consumer finance segment of the intermediation industry, tend to support three of the four empirical contentions suggested at the beginning of this section. Both loan portfolio losses and rejection rates are related in the expected direction to the existence of binding interest rate ceilings. Moreover, there is some rather indirect evidence that the moral hazard problem plays a part in the lending decision. Under rate ceilings, those loans and borrowers perceived to have low moral hazard are extended credit more readily. However, there is no evidence that the risk characteristics of rejected and accepted customers is different. The evidence, therefore, is mixed. Rate ceilings seem to have some effect on credit availability to high risk/moral hazard borrowers, but the magnitude of the effect measured by these studies is weaker than expected. In part, some of the blame for the ambiguity
can be traced to the general lack of concern over major econometric problems that emanate from an inability to measure loan risk and the level of the credit ceiling. It seems certain that, if anything, these studies have understated the size of the effect on credit availability.

The applicability of these (admittedly mixed) results to small business lending is appropriate. While small business loans are much larger, and the confounding effect of the cost of making small consumer loans is absent, the variation in risk and moral hazard (not the level) among small business loan applications is probably more similar to the consumer loan market than it is to the mortgage loan market, where most other studies of the impact of rate ceilings have concentrated.

Evidence on the Effect of Rate Ceilings on Loan Terms

Part of the hypothesized effects of binding usury rate ceilings is expected to take place through an adjustment of loan terms. The model developed in Section II proposed that the adjustment of loan terms would be the natural consequence of a binding rate ceiling. Loan amounts would drop relative to borrower collateral, maturity would tend to be reduced, and greater efforts would be made to monitor borrower actions to prevent "me-first" type transfers. Studies of the effects of ceilings on loan terms are few—most likely because of the lack of data on important parts of the loan agreement.
However, two mortgage market studies by Ostas [28] and Ostas and Zahn [29] supply some indications of the effects of ceilings on loan terms that are an important part of the mortgage instrument. Ostas' study employed a two-stage regression procedure. He first estimated the spread between the equilibrium contract rate that prevailed in the unregulated market and the ceiling rate on conventional loans and then used this estimated spread as the measure of the extent to which usury laws were binding in the second state regressions. His monthly data covered 15 SMSAs over a 6-year period.

Holding constant both seasonal and geographic influence, he found in his regressions that:

1. **Loan fees** were significantly positive-related to the extent to which ceiling rates exceed an estimate of the free market rate.

2. **Loan-to-value ratios** were significantly negatively-related to the ceiling rate variable. The elasticity (at the means approximated) suggested that an increase in the ceiling rate from one percentage point below the market to the market rate implies about a 4 or 5 percent increase in the loan-to-value ratio.

3. **Loan maturity** was not significantly associated with binding rate ceilings.

Importantly, alternative specifications of the contract rate used in defining the ceiling rate variable did not change the magnitude of the relevant coefficients.

Loan fees are, of course, a direct substitute for interest rate charges. However, loan-to-value ratios and maturity have an impact on both loan risk and moral hazard. This evidence suggests that bank
reactions are in accordance with our expectations. As the ceiling rate drops relative to the free market rate, loan amounts are reduced. Since there is only one senior mortgage on a residence, borrowers are prevented from securing equivalent added credit to offset the reduction in loan amount (though in some cases, second mortgages are available). Thus, this adjustment is an effective way to reduce loan risk—perhaps to a level that would justify an equilibrium interest rate that was at or below the ceiling rate.

Obviously, such a change in loan terms would have demand side effects as well. As some would-be borrowers will reduce their demand after observing the increased cost of the larger down-payment, as the required loan-to-value ratio drops, or larger periodic payments that are associated with the shortened maturity.

A case analysis of Minnesota's usury law during 21 months in 1969 and 1970 and 24 months during 1973, 1974 and 1975 by Rosnick, Graham and Dahl, found somewhat similar results. In comparison with the average of a number of states in which ceiling rates were non-existent or non-binding, the Minnesota's ceiling resulted in a shortened maturity and a rise in downpayment on residential mortgages.

In a model similar to that of Ostas, but one that did not explicitly account for interest rate ceilings, Ostas and Zahn [29] found that the required down payment was used as an equilibrium adjustment mechanism. Thus, when market conditions get tighter, interest rates themselves do not immediately change enough to
eliminate supply-demand imbalances. The market seems to use the down payment (or loan-to-value ratio) as a short run equilibrating mechanism. These results are consistent with the findings of Ostas and our hypothesis that lenders set loan terms according to the description given in equations (1) and (2). Generalizing from the Ostas-Zahn study, we would conclude that as ceiling rates create a supply-demand imbalance, other loan terms are used (necessary in this case) as a mechanism to equilibrate supply and demand.

If the banks making small business loans operate in a manner similar to the intermediaries studied by Ostas and Ostas and Zahn, then we would expect to see loan terms changing as ceiling rates become binding. This would increase the cost of the lending arrangement to the small businesses by forcing a non-optimal loan arrangement, but may provide a mechanism for justifying a smaller reduction in credit availability than would be the case if loan terms were not allowed to adjust. In graphic terms, the adjustment of other loan terms provides a means for the small business to be at the financial structure $(D/E)_{1,2}$ rather than, say, $(D/E)_{3}$ in Figure 4 (a severe restriction on credit), and at investment level $I_{2}$ rather than $I_{3}$ in Figure 5. The benefit occurring from the change in loan terms that negates the impact of ceiling rates on credit availability is indicated by the cross-hatched area between $r_{2}$ and $r_{3}$. These studies indicate a tendency towards this resolution to the ceiling rate constraint, but give no clue as to the magnitude of the value
lost by the constraint, or the magnitude of the value regained by the change in loan terms used to offset the constraint.

Figure 4

OPTIMAL FINANCIAL STRUCTURE
Evidence on the Effect of Rate Ceilings on the Movement of Loanable Funds

In any restricted market, the lender may find it in his best interest to shift out of the market for rate restricted loans into markets where rate ceilings are higher or non-existent. Yet, because of the complexity of regulations, lenders may find themselves unable to take such actions. Sometimes, lenders are forced to specialize by regulation. Other times, the expertise of the lender may not be easily or without cost transferred to other markets. Consequently, it is important to determine the extent and rapidity with which lenders shift between markets. Studies by Smith, Schafer, and Kohn, Carlo, and Kaye have directly addressed this issue.  

Smith [38], in a time series study of the ceiling rate on Canadian National Housing Administration (NHA) mortgages, holding corporate bond yields, institutional fund inflows, and the proportion of investments in mortgages constant, found a significant effect associated with the interest differential between conventional and NHA mortgages. In particular, for separate equations explaining the change in the

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23 Indirect studies of this issue are too numerous to mention. Economists have generated literally volumes on the flow of funds into and out of various sectors of the economy. Most of these studies have some very limited relevance to the issue of interest rate ceilings. The studies, in general, have shown that suppliers of funds do shift loanable funds between markets as a function of risk-adjusted interest rate differentials. Since ceiling rates seem to create interest rate differentials, these studies suggest that ceiling rates tend to be avoided by the shipment of loanable funds to other, non-restricted markets.
volume of NHA and conventional mortgage approvals, the coefficients on the change in the interest rate differential variable were of the same approximate magnitude, but opposite in sign. These results held strongly for trust and mortgage loan companies and life insurance companies, but were somewhat weaker for non-bank financial intermediaries. Apparently, there is a rather quick and decisive movement of funds by lenders from the constrained sector to the unconstrained sector as the constraint becomes more binding. This will cause little damage if borrowers have access to both markets, but can result in substantial lack of funds for those that have the constrained sector as their only borrowing alternative.

Schafer finds similar results. His study of the lending activity of New York State savings banks shows that both out-of-state lending and FHA in-state lending is substantially influenced by whether the New York State usury ceiling is binding. His coefficient estimates suggest that New York State mutual savings banks increase their holdings of out-of-state mortgages by $200 million annually for each 1/2 percentage point the usury ceiling is below the market rate. This differential occurred in eight or nine of the eighteen periods included in the study. In addition, New York mutual savings banks' holdings of in-state FHA mortgages decline by over $100 million for every 1/2 percent the FHA ceiling rate was below the market rate. Kohn, Carlo, and Kaye found similar results. In their study, state chartered savings and loan associations and commercial banks in
New York tended to shift their asset holdings out of controlled loans during periods when the state usury ceiling was below the uncontrolled rate in other states. Further, the shift in institutional portfolios was more dramatic during periods when the gap between the usury ceiling and the market interest rate was widest. Finally, in the Ranick, Graham and Dahl study of Minnesota's ceiling, there was a marked shift of funds from conventional to FHA mortgages in late 1974 when the ceiling was most binding. When the ceiling was relaxed and allowed to float in late 1975, there was a substantial portfolio shift by Minnesota lenders back to conventional mortgage instruments.

Given the similarity of results, it is important to realize that the econometric studies of Smith and Schafer had substantially different variable and equation specifications. Smith viewed the change in the interest rate differential and Schafer used the level of the differential only when the market yield exceeded the state or FHA ceiling as the explanatory ceiling variable of interest. Smith's dependent variable was the change in mortgage approvals of a given type, and Schafer's was the change in out-of-state or FHA holdings. Other explanatory variables were defined in different ways as well. In spite of these differences, the results of the two studies seem to document the general fungibility of credit in the mortgage market.

The mortgage market is substantially different from the small business loan market. Can it be expected that the high cross elasticity of supply observed in the mortgage market would also hold
for the small business loan market? In general, the answer is an unequivocal yes. If anything, the asset restrictions placed on many mortgage lenders gives them less portfolio flexibility than have most commercial banks. Banks generally are not restricted by either regulatory authorities or by tax incentives to holding a particular kind of investment portfolio. Thus, even more than specialized lenders, commercial banks would find it possible to shift easily from a market that was constrained by interest rate ceilings to one that was not constrained. Since small businesses make greater use of bank credit than any other kind, we would expect these shifts to have a substantial impact on small business credit from commercial banks.

Evidence on the Effect of Rate Ceilings on the Volume of Intermediation

The prior sections have considered the possible effects of ceiling rates on the availability of funds to high risk borrowers, on loan terms, and on the flow of loanable funds to different unregulated sectors of the financial markets. Here, we consider evidence on the volume of intermediation that cannot be attributed to one of the above efforts. Essentially, the question asked here is, "are there some classes of borrowers who are eliminated from the market for reasons other than risk"?

The study of Maine by Eisenbeis and Murphy [12], mentioned previously, has some relevance to this issue. Specifically, they found that there was a substantial group of potential borrowers who were initially judged credit-worthy by consumer finance institutions.
themselves, but who were denied credit on terms longer than 36 months. Partly because of the usury ceiling, consumer finance lenders were moving out of state. In addition, about half of those denied credit by the finance companies were unable to obtain funds elsewhere while about half were unable to get funds from banks, credit unions, or other finance companies. Consequently, the usury ceiling seems to have had a substantial effect upon the volume of lending. As mentioned previously, Eisenbeis and Murphy were unable to conclude that the disappearance of credit impacted more harshly on high risk customers. The division of those initially denied credit into those who were ultimately able to secure funds and those who were not depended heavily upon the presence of existing customer relationships with other financial institutions. Nevertheless, the general availability of credit, and the extent of consumer type intermediation seemed to fall.

Evidence on the Effect of Rate Ceilings on the Level of Business Activity: Supply Induced

The effect of ceiling rates on the cost and availability of financing is necessary but not sufficient to document an ultimate effect on the potential borrowers level of business operations. Constraints on financial capital would be expected to limit investment in working capital and earning assets, but to do so only if alternative sources of loanable funds are unavailable in unconstrained markets. All results summarized in prior sections dealt with the effect of rate ceilings on the cost and availability of financial
capital. In this section, we summarize the results of different studies that have directly associated the impact of rate ceilings with the level of business activity.

Robins [31] formulated a straightforward cross-sectional empirical investigation of the relationship between housing starts and rate ceilings on residential mortgages. His units of observation were standard metropolitan statistical areas (SMSAs). The relevant explanatory variable, the ceiling variable, was constructed as a dummy variable—taking on a value of one if the ceiling rate was less than the market rate in eleven "unconstrained" SMSAs. A number of housing demand variables were included as control variables.

Robins found that, on average, housing starts were 28 percent lower in SMSAs where the rate ceiling was calculated as being below the market rate. While this is probably a reasonable point estimate of the effect of a binding rate, there are a number of important deficiencies in the model that restrict the generality of the results. First, the use of a dummy variable to model the effect of rate ceilings does not capture the incremental effect of "more binding" ceiling. That is, because the more restrictive rate eliminates more of the high- to moderate-risk borrowers the effect of rate ceilings on housing starts is expected to be a function of how restrictive the ceilings are. The empirical specification is not consistent with the (admittedly more recent) theoretical construct.

24 Robins attempted to deal with this issue by formulating an alternative dummy variable that measured whether or not the rate ceiling in that SMSA was more than 1 percent below the market rate.
Second, he feared some heteroskedasticity, and attempted to test for its presence by dividing housing starts and population growth variables by population. This procedure is not generally an acceptable way to eliminate heteroskedastic residuals, and the suspicion remains that the results may be substantially different with different equation specifications.

Yandle and Proctor estimated a similar model using statewide data. They also cast the ceiling rate as a dummy variable depending on whether or not they determined it was a binding ceiling. They included both demand and supply variables to control for other effects, and found that states without binding ceilings had higher levels of housing starts in the 1973-74 period, but not in the 1969-1970 period. This study suffers from the same problems as does the Robins study, and more. Heteroskedasticity is undoubtedly a much more severe problem, and the results seem to be dependent on the specification of whether demand or supply variables are held constant.

The Ostas [28] study of loan terms, discussed in detail earlier in this section, also attempted to relate ceiling rates to housing starts. Ostas found a significant negative relationship in pooled time series of fifteen SMSAs over the 1965-1970 period using quarterly observations. The rate variable, it may be remembered, was defined as the difference between an estimate of the rate that would exist in that state if ceilings were not binding (estimated from a first stage regression) and the rate ceiling. To test for heteroskedasticity,
Ostas divided both sides of the equation by a scale factor and generated similar results. In both equations, he found housing starts declined by 15 to 20 percent for each percentage point the ceiling rate is below the market rate.

Ostas' study does not suffer from some of the problems inherent in Robins' model, but contains an important possible problem itself. In particular, the use of time series observations does not allow discrimination between the effect of the ceiling and the effect of demand induced changes in housing due to changes in the level of the market interest rate. Over time, if the ceiling variable becomes more binding, due to increases in the market rate, then any reduction in housing starts will reflect both the lack of financing due to the constraint and the reduction in demand that is associated with the increased market rates. It is difficult to determine the importance of this confounding influence in the Ostas study because of the use of both cross-sectional and time series data. If most of the variation in the housing starts is between SMSAs, then the effect of demand induced changes in housing starts is of less significance, but the effective number of degrees of freedom drops drastically.

Concern over housing and housing finance has resulted in a large number of econometric studies of the aggregate relationship between mortgage rates and housing starts. None of these studies have attempted to account for the extent to which state usury rate ceilings are binding, and only one or two have incorporated FHA or VA ceiling
rates. Yet, some important relationships can be gleaned from these studies. Estimates of the elasticity of housing starts with respect to the mortgage rate give values ranging from a low of 0.6 to a high of -2.8. These figures indicate that an increase in the mortgage rate of 10 percent (say, from 5 to 5 1/2 percent) brings about a decline of housing starts on the magnitude of 6 to 28 percent. These estimates were, of course, formulated from data through the early 1980s when the general level of interest rates was much lower. The implication of these studies is that an unknown portion of this elasticity is attributable to the interest rate bumping into state ceiling rates as the equilibrium mortgage rate rises.

In a similar study, Huang [19] found that the quantity of housing starts and mortgage money financed with VA mortgage loans rose with the difference between the VA mortgage rate and the market rate. This initially perverse appearing result is consistent with the idea that more starts and financing occur as the VA ceiling rises since the VA rate typically has been at the ceiling. In other words, more VA loans are made as the ceiling rate on VA loans gets close to or slightly above the market rate. There was no similar relationship observed for FHA loans and starts, however. None of the Huang models, or the other aggregate models for that matter, have been developed to specifically analyze the effect of rate ceilings. These figures, then, include the

\[25\] Taken from estimates formulated by Kearl, Rosen, and Swan [23].
effect of rate ceilings as well as the effect of demand and other supply influences on the level of housing starts.

Unfortunately, there are no studies of the effect of ceiling rates on business activity other than these studies of construction. While it seems clear that the effect of ceilings is to substantially reduce the level of residential construction activity (as does the effect of unconstrained increases in market rates), it is not clear how valid it is to generalize these results to the small business market. Residential construction probably has fewer alternative sources of financing and is inherently more volatile than is the case for small business. Consequently, we would expect the effect on small business operations to be somewhat less. Nevertheless, the evidence, such as it is, is consistent—rate ceilings reduce the level of business operations.


