This paper examines who holds first mortgage loans on single family detached properties in different locations throughout the urban area. The analysis is based on Census tract data from the 1971 Census of Canada. The spatial pattern of first mortgage loans held by Financial Institutions, Private Individuals, Government and Other Lenders are described in a series of maps and then interpreted in terms of historical and motivational factors. Some implications of the spatial pattern for the demand for older existing housing in the inner city are discussed. The detailed evidence for the Toronto CMA 1971 is compared to patterns in other Canadian CMA's. The issues which this paper raises for further research are discussed.
ACKNOWLEDGEMENTS

With the receipt of the Connaught Grant by the Centre for Urban and Community Studies for the study of housing, it was possible to begin a systematic study of the structure of the 'inner city mortgage market' within the local urban housing and residential mortgage market as a whole. Several members of the Centre contributed to the study. Larry Bourne, John Hitchcock and Jim Simmons collectively gave me the freedom and resources to explore this topic as well as offering helpful advice on an earlier draft. Bruce Becker applied his skill as a computer programmer to the catographic requirements of this study and has clearly demonstrated his contribution through the maps which appear in the text. Much of the data for mapping was carefully prepared by Geoff Dobilas.

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Philip S. Morrison
August 1979
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INTRODUCTION

The supply and cost of mortgage credit are major factors affecting housing demand. Hence factors which affect the temporal and spatial supply of mortgage capital become of central importance in understanding the dynamics of the housing market.¹

This paper explores the relationship between who lends mortgage and where they lend within the city. It shows that the provision of finance is structured differently when urban areas are compared and that the source of mortgage finance varies systematically by location within cities.

In Section 1 three categories of mortgage lender are considered and historical evidence of their changing relative importance is presented. Section 2 examines the residential areas in which different lenders hold mortgage loans within the Toronto urban area. Section 3 asks whether the distributions derived for Toronto are common to other Canadian cities.

While the primary emphasis in this paper is the description of the spatial pattern of mortgage holdings, the assembly of the evidence is motivated by a concern with how the availability and cost of mortgage finance from different sources affect the demand for dwelling units in the older inner residential areas of Canadian cities.

¹ For a review of the distribution of mortgage debt in Canada by characteristics of owners see Statistics Canada, 1979.
SECTION 1. WHO LEADS MORTGAGE FINANCE IN CANADA?

Lenders may be categorized according to the motivation and constraints which influence their lending behaviour. For this analysis, lenders may be grouped in three categories.

1. Financial Institutions
2. Private Individuals
3. The Public Sector

'Financial Institutions' is a collective term which includes chartered banks, trust companies, mortgage and loan companies and insurance companies. Later we include a section called Others which includes organizations such as credit unions whose collection and disposal of funds is heavily influenced by shareholders whose particular demands for funds have to be met. By contrast, 'Private Individuals' include mainly single investors and vendors (sellers of their own dwelling unit). This group also includes individuals who, although they use their own funds, are especially skilled to enter this market: real estate agents, lawyers and other professional single person lenders.1

Lending by the Public Sector (as opposed to underwriting) includes loans from Municipal, Provincial and Federal Agencies. Together this is a small but not insignificant sector of the market and is both organizationally and geographically distinct from the two other groups of lenders.

At the risk of considerable simplification, the Financial Institutions may be said to be motivated by profit and act to maximize the aggregate net returns to their overall investment portfolio. The Private Individual on

---

1See Poapst, 1962, for a seminal discussion of this group.
the other hand is constrained by quite another set of requirements. Most private lenders are sellers of their own home and in many cases whether to lend, how much and on what terms is governed by the additional return in terms of sale price of their house, not by alternative investments in the capital market.

Finally, the allocation as well as pricing of mortgage finance by the Public Sector reflects broader national provincial and local municipal economic goals, particularly those of stability in the building industry. Thus any model of lending by the State will differ again from that constructed for Financial Institutions or Private Individuals. At the same time no lender group is immune to the lending practices of the others.

The role of the state is much broader and influential than direct lending. Corresponding with the constitutional powers, the contribution of the federal government is mainly economic (mortgage insurance, rates and regulations), and that of the junior governments is mainly of an administrative and planning nature (urban growth, welfare, utilities, community services, etc), (Illing, 1964:30).

Some of the more important general measures by which, under the terms of the N.H.A. administered by CMHC, the federal government may influence the housing market are 1) underwriting of mortgage investments of approved lenders for the construction of new housing for sale or for rent; 2) the stipulation of down-payment requirements; 3) the establishment of maximum amounts for loans; 4) the loan-to-value ratios; 5) mortgage interest rates, and; 6) terms of amortization; 7) guarantee home improvement loans made by banks to home owners (Illing, 1964:30).

It is obvious that a thorough understanding of the evidence presented below must recognize and explicitly evaluate the many ways in which the
government(s) can influence the spatial and temporal patterns (as well as the cost) of mortgage finance. Since this paper is intended to be exploratory, no attempt is made here to study such relationships in any detail.

Relative Shares of Mortgages Held – An Historical View

In Canada in 1971, 66.1 percent of those owning single-detached-owner-occupied properties (SDOO) were encumbered with one or more mortgages. Of these, 62.6 percent were held by Financial Institutions (which rises to 70.8 percent if others such as Credit Unions are included), 19.4 percent by Private Individuals and the remainder were held by government, 9.8 percent (Statistics Canada, 1973 Cat. 93-732, Table 39-1).

This pattern reflects only a recent national picture of a sector in which the relative position of lenders had changed radically. Some central themes in this evolution are suggested in Figure 1. Private lending and lending by Financial Institutions jointly accounted for about 90 percent of all mortgage loans outstanding up until the National Housing Act (NHA) of 1954. At the same time these data and the census data to be presented reflect the state of the mortgage market in the early 1970's. Of some importance in interpreting the maps to follow is the fact that banks were out of the mortgage market from 1959 to 1969. Since that time their mortgage lending has developed to high levels and their importance in 1979 is much greater than in 1971, the year for which the maps to follow were compiled.

\[2\] I am indebted to Professor J.V. Poapst for drawing this factor to my attention (personal communication, June 1979). Documentation of the changing role of banks is given in the final section of the paper.
Note: These trends are indicative only. The warning on the original source is as follows: "These estimates are believed subject to too large an error to permit publication. The "personal sector" includes individuals, unincorporated business and non-profit organisations."

Inspection of Figure 1 suggests that Private Individuals were the dominant source of mortgage finance during periods of economic recession and the immediate Post-War period. After the National Housing Act of 1954, the relative importance of the Private Individual declined as the State began to make a concerted attempt to encourage greater investment by Financial Institutions in the mortgage market (Illing 1964:20). It must be emphasized, however, that the data in Figure 1 are of mixed quality, as the note to that table indicates. Unlike data on Financial Institutions and Government, estimates of individual lending are based on mortgage registration data. Such registrations may not be associated with the advancement of funds, and even when they are, do not correspond to mortgage debt outstanding.

Nevertheless supplementary data from Ontario do support the apparent secular decline in Private Lending indicated in Figure 1, at least in terms of mortgages registered by Private Individuals. In terms of the value of these registrations, the personal sector fell from 47.7 per cent to 29.9 per cent over the 6 years from 1969 to 1975. The number of mortgages so registered fell accordingly, from 56.6 per cent of the total to 37.8 per cent.

Little attention has been paid to the possible implications of the relative decline in lending by Private Individuals. It has been argued elsewhere (Egar, 1976; Vidger, 1967) that the private sector serves as a source of mortgage money during periods when the financial institutions, responding to relative higher yields on other instruments (especially bonds), choose to reallocate capital funds away from mortgages. Under these circumstances the personal sector acts as a cushion, modifying what could in some locations lead to a severe shortage of mortgage money and
TABLE 1

RECENT CHANGES IN THE COMPOSITION OF MORTGAGE LENDERS IN
THE CONVENTIONAL MORTGAGE LOAN MARKET, ONTARIO,

<table>
<thead>
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</thead>
<tbody>
<tr>
<td><strong>Value of Mortgages Registered (Percent of Total)</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Sector</td>
<td>47.7</td>
<td>46.9</td>
<td>38.9</td>
<td>35.0</td>
<td>32.0</td>
<td>32.9</td>
<td>29.9</td>
</tr>
<tr>
<td>Financial Institutions *</td>
<td>30.7</td>
<td>34.3</td>
<td>42.5</td>
<td>45.7</td>
<td>50.0</td>
<td>48.3</td>
<td>53.1</td>
</tr>
<tr>
<td>Public Sector</td>
<td>3.6</td>
<td>3.4</td>
<td>3.3</td>
<td>4.9</td>
<td>3.1</td>
<td>4.3</td>
<td>5.2</td>
</tr>
<tr>
<td>Corporate Sector</td>
<td>18.0</td>
<td>15.4</td>
<td>15.6</td>
<td>14.4</td>
<td>14.9</td>
<td>14.5</td>
<td>26.3</td>
</tr>
<tr>
<td><strong>Number of Mortgages Registered (Percent of Total)</strong></td>
<td></td>
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<tr>
<td>Personal Sector</td>
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<td>56.7</td>
<td>49.0</td>
<td>43.9</td>
<td>40.8</td>
<td>39.7</td>
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</tr>
<tr>
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<td>33.8</td>
<td>38.3</td>
<td>42.5</td>
<td>42.1</td>
<td>44.8</td>
</tr>
<tr>
<td>Public Sector</td>
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<td>1.9</td>
<td>2.4</td>
<td>3.8</td>
<td>2.6</td>
<td>3.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Corporate Sector</td>
<td>16.2</td>
<td>15.0</td>
<td>14.6</td>
<td>14.0</td>
<td>14.1</td>
<td>15.0</td>
<td>13.8</td>
</tr>
</tbody>
</table>

*Includes Insurance companies, Loan and Trust companies, Chartered Banks, Credit Unions and Co-operatives, and Benevolent Societies.

thence to a decline in local housing demand.\textsuperscript{3}

This argument has an interesting counter argument. Poapst has suggested, for example, that unlike the financial institutions the vendor does not, for the most part, have an alternative investment. Some vendor lending must be motivated, for example, by a desire to capture some of the benefits of assigning to the buyer an existing first mortgage that has a low interest rate (such mortgages could also be expected to have a low loan-to-value ratio and require considerable bridge financing to meet the downpayment available from the borrower). The point is, however, that vendor lending capacity is also likely to vary over time with the prices of single detached dwellings. Thus it may well be that some of the instability attributed to institutional lending an older properties is actually the obverse of instability in lending by vendor mortgages.

Each of these points raises a number of questions about the way different lenders and Private Individuals in particular behave under different market conditions. Differences in their behaviour is of special importance because, as will be shown in more detail below, the two suppliers tend to operate in different residential areas within a city. If the market formerly occupied by Private Individuals in increasingly being occupied by Financial Institutions then the following questions at least should be asked: What happens for example when the total money available for mortgage investment decreases? Does it become less available in some (older?) residential areas before others? How do interest rates, 

\textsuperscript{3}This is the specific theme of Egar's study (1976) in which he argues that the presence of non-institutional lenders accounts in large part for the lower amplitude in mortgage interest rates as compared to the bank rate. Also see the evidence given by Vidger, 1967.
capital value ratio requirements and term structures alter in such periods and how is this alteration felt throughout the urban area?

There is no attempt to answer these questions here. Rather in Section 2 to follow we show how the mortgage market is segmented among different lenders. In so doing we suggest that if there is a shift in the distribution of lenders over the residential area or areas, and if mortgage lenders do differ with respect to the mortgage instruments they originate, the standards they use and rules they operate by, then the impacts of these shifts will be felt spatially and will be associated with population change in discrete residential neighbourhoods.

SECTION 2. MORTGAGE LENDING IN THE TORONTO AREA

This section examines locational variations in the source of mortgage lending in the Municipality of Metropolitan Toronto. The primary data source is the 1971 Canadian census. Since this paper is thought to be the first to analyse these particular census data in any detail it is important that the nature of the statistics to be presented are clearly understood. Figure 2 has been compiled to illustrate the fact that data are only available for certain kinds of properties under certain tenure.

Figure 2 begins in level 1 with the total number of dwelling units in the Toronto CMA. Our analysis is confined to the Municipality of Metropolitan Toronto. We can only analyse those dwellings on which first mortgages are held and these only occupy 66.1 percent of all possible dwellings in the CMA; 62.1 percent in the Municipality.

On the basis of these constraints this study is confined to an analysis of just over one third (1/33.67) of the total possible number of first residential mortgages held in the Municipality of Metro Toronto. Since single attached and row housing do not hold the same relative status
FIGURE 2

DATA: SUCCESSIVE CONSTRAINTS

Level

1  Toronto CMA. All Residential Dwelling Units  
   (n = 773,985; 100%)*
   
   Municipality of
   Metropolitan Toronto (n = 629,270; 81.3%)**

2  CMA less Metro Rented Dwelling Units
   
   All Owner Occupied Dwelling Units  
   (n = 332,515; 42.9%)**

3  Rented Dwelling Units
   
   Single Attached and Apartment Dwelling Units
   Single Detached Owner Occupied Dwelling Units, (SD00)  
   (n = 231,155) 29.86%

4  No Mortgages
   
   With One or More Mortgages  
   (n = 143,540) 18.54%

5  Census Tracts with less than 24 SD00 with one or more mortgages
   In Census Tracts with 25 or more SD00 with one or more mortgages

Dwelling units included in the sample

Dwelling units omitted from the analysis


**City of Toronto Planning Board, Research Division, 1974.

***User Summary Tape. 347 Census Tracts of Metro Toronto. This source also applies to levels 4, 5, 6.
to consumers and are located in different neighbourhoods in the city, it is unlikely that we can generalize about the magnitudes of holding by owner occupiers of single detached units to other dwelling unit types. Similar objections would be made in generalizing to rented dwelling units, and from first mortgages to the full set of first and second mortgages.

While most of the constraints in Figure 2 are disadvantages, when it comes to interpretation there are some real benefits to be appreciated. By confining the analysis to SDOO dwellings we are in fact exercising control over differences in tenure and dwelling type which may otherwise confound interpretation. In particular our constrained sample allows us to interpret locational variation in mortgage lending with more confidence, knowing that composition effects due to tenure and housing type are not present.

The following analysis is based on 143,310 first mortgages as these are grouped into 311 census tracts. The average number of SDOO dwellings per tract is 668, and the maximum is 2630; the standard deviation is 530. The fifth constraint is imposed to ensure that statistics produced for any census tract are based on at least 25 dwelling units per tract. (See Appendix 1 for details of the data sources).

The essential geographic features of the Toronto mortgage market are conveyed in four maps, one for each type of lender: Financial Institutions, Private Individuals, Others and Government. Each map shows the proportion of first mortgages on SDOO dwelling units within each census tract held by a given lending group. There are five equal proportions as class intervals. Those declared missing include those where no SDOO dwellings with first mortgages are present and those where there are less than 25 of such dwellings in a tract.
Lending by Financial Institutions

Given the question and importance of Institutional Finance, the pattern of lending by Financial Institutions as conveyed in Map 1 is the most significant. The darkest shaded tracts, indicating that over 80 percent of all first mortgages on the sampled SDOO properties are held by Financial Institutions, occupy a band about the periphery of the Metro area. In stark contrast is the relative lack of lending on SDOO properties in the inner part of the urban area. Between the inner and outer urban area is a gradation of surprisingly regular proportions. The systematic component is unmistakable.

A number of reasons for the pattern in Map 1 can be suggested. Before they are advanced, however, a more careful consideration of what is actually being presented in Map 1 is called for. The problem centres around how one interprets a cross sectional, or snap-shot, view of a set of mortgage loans, some of which may have been initiated as long as 30 years prior to 1971.

Interpretation of data in this cumulative form is more straightforward for the Canadian data because of the structure of the mortgage market itself. Unlike the U.S., Canada has a relatively small, undeveloped secondary mortgage market (Poapst, 1977). Since mortgages initiated by a bank, trust company or private lender are not usually sold on the secondary market the present holder of the mortgage as referred to by the census respondent is likely to be the originator.

The existence of different origination dates will influence the way we interpret spatial distributions of 1971 holdings. Since sources of residential mortgages can vary considerably from year to year (as noted in Figure 1), spatial differences in the proportion of mortgages held by any one category of lender could occur purely as a reflection of the
MAP 1. MORTGAGE LENDING BY FINANCIAL INSTITUTIONS. TORONTO 1971

The Percentage of First Mortgages on Single Detached Owner Occupied Dwelling Units Within Each Census Tract Held by Financial Institutions

distribution of dates over which the mortgages were obtained.

The main interpretative problem which the cumulative nature of these unadjusted census data raises lies in the assigning of particular motivations or mortgage lending strategies to particular holders of mortgages. While no adjustment is made to the mapped data in this paper it is important in our interpretation of the maps that the effects of the time of mortgage origination be kept in mind. The following formal statement may be useful.

**The Origination of Mortgage Loans and Map Interpretation**

Let the term mortgage cohort refer to originations of first mortgages in particular years. Since we are dealing with one mortgage per property the unit is both the mortgage instrument itself and the dwelling unit. More specifically, let \( m_{tk} \) be the number of residential mortgages (in SDOO properties) originated in the year \( t_k \) where \( t_k = -1, -2 \ldots -n \), where \(-n\) is the farthest data back in time in which a mortgage held in 1971 was originated.

Not all mortgages originated at \( t_k \) exist at \( t \), our date of observation (1971), and the earlier the origination, the less likely they are to be present. Some will have been paid off by the borrower in the conventional manner so that a debt no longer exists, some may have defaulted and still others will have been paid off through refinancing. The first two cases represent a loss to the cohort. In the last case the mortgage will be replaced by another mortgage so that the dwelling unit in one mortgage cohort will 'shift' to become a member of another later mortgage cohort. The relative importance of these different types of losses will vary depending largely on \( k \), the period prior to 1971.
The probability of a given mortgage originated at time $t_k$ still existing as such at $t$ will be given by the survival rate $S_{tk}$, where $0 \leq S \leq 1$. The measures $m_{tk}$ and $S_{tk}$ hold for all first mortgages on all SDOO properties extant at $t$. Since we are interested in the history of mortgage originations under different types of lenders, the term $p_{tk}$ will be introduced to denote the probability of a mortgage being initiated in year $t$ by the $i^{th}$ lender where the subscript $i$ refers to the Financial Institution, Private Lender, Government or Other as we have defined these above. Hence, if the spatial scale is Canada as a whole, then $(m \cdot p_{itk})$ is given (very approximately) by Figure 1.

The system to $t$ time periods prior to 1971 for the $i^{th}$ lender in the $j^{th}$ tract is represented in equation 1 in terms of the vectors $m$ and $h$ and the square matrices $P$ and $S$.

\[(1) \quad (S.(m.P))_{ij} = h_{ij}\]
Thus the vector $h_{ij}$ gives the number of mortgages initiated by the $i^{th}$ lender in the $j^{th}$ census tract at $t_k$ which are still held at the time of the last census, $t$. The total number of mortgages currently held by the $i^{th}$ lender is the sum of $h_i$,

$$\sum_{i=1}^{4} h_i$$

the number of mortgages reported in the census (for the $j^{th}$ census tract). The term

$$(h_i \times 100 / \sum_{i=1}^{4} h_i)_j$$

is the figure mapped in each census tract in Map 1.

Since the number of first mortgages held by a given lender on dwellings at a given location is not independent of the magnitude of lending by different lenders in different time periods, if we are to describe the forces leading to the spatial distribution of lending say in the two or three years prior to 1971 it is necessary to discount or partial out the effect of the variation in origination dates.

The idea is to use equation 1 to weight $h_{ij}$ so as to bring the distribution of lenders, as measured by the cumulative lending patterns, in closer correspondence to the 1971 lending patterns. For example, if one were to adjust the individual census tracts in Map 1 to correspond more closely to lending of financial institutions in the last three years, then one might divide the present observations $h_{i=1j}$ by

$$\sum_{t=1}^{3} \sum_{t-1=1}^{tr} h_{tr}$$

which will render $h_{ij}$ as a proportion of the number of loans made by financial institutions in that tract in the last three years. Since the
loan instrument and the dwelling unit are one in the same in this case, such weights may have to approximated by \( l_{ij} \), the length of owner occupancy in the tract. Until \( l \) can be obtained for each lender category \( i \) and each census tract \( j \), the use of equation 1 will have to remain as a conceptual device. In practice therefore, matrices \( P \) and \( S \) also remain unknown.

One of the immediate consequences of such a weighting would be a recognition of the disproportionate presence of financial institutions as lenders on recently built dwelling units. Clearly, the pattern indicated in Figure 2 is in large part due to the fact that mortgages transacted for recently built houses will, by virtue of post war trends in the distribution of mortgage money over different lenders, be more likely to have mortgages held by financial institutions and government than from private lenders or others. Further implications of equation 1 will be referred to below. Additional aspects of Figure 2 will now be discussed.

An Account of the Spatial Distribution of Lending by Financial Institutions

Interviews with Canadian mortgage lenders have revealed a consistent set of criteria with which to guide the lending decision. The nature of the mortgage instrument implies that money is lent on the basis of a defined security and by definition the collateral is the property. The characteristics of the property therefore feature prominently in any loan decision.

Hatch reports such a set of factors pertaining to the single family property as identified in interviews with a range of Canadian mortgage lenders, Table 2. These factors may be used to guide our analysis (Hatch 1975: 106). They include the physical size of the property, the physical condition, external and legal conditions and expectations about the nature of the future demand for properties in an area, the so-called transitional state of a neighbourhood.
### TABLE 2

FACTORS CITED BY MORTGAGE LENDERS AS IMPORTANT IN GRANTING MORTGAGE LOANS. A SYNTHESIS

Some features that tended to decrease the mortgageability of single family residential properties include:

**The Physical Size of Property**

- Small lot
- One or two bedroomed house
- No basement or only a partial basement
- Shared driveway

**Physical Condition**

- Building does not meet the standards of the National Building Code
- Property is old and not modernized
- Building is structurally unsound
- Certain types of artificial siding

**External and Legal Conditions**

- Located outside city limits
- No municipal water supply or sewers
- Property is on leasehold land (except under the HOME plan)
- Property is outside the institution's lending area
- Mortgaged property is not owner occupied
- Property is part of a strip development
- Subject to noise or other pollution

**Future of Neighbourhood**

- Neighbourhood is in transitional stage

Some of the features that lenders felt tended to make a house mortgageable include:

- On a cul-de-sac or court
- New house in a reasonable location
- No heavy traffic on street
- On a treed lot
- Finished recreation room, and
- All services readily available.

Age of Property:

An inspection of Table 2 will show that a number of these items are highly correlated with age of property. Since age denotes newness, age is highly associated with condition as well as neighbourhood quality, density and lot size. But age also directly reflects the timing of involvement by financial institutions in the mortgage market. The positive correlation of age of dwelling (post 1950) with lending by financial institutions is quite clear in Map 1 and this again is reflected in the scattergram of Figure 3. Age accounts for over 70 percent of the variance in propensity to lend in this ecological correlation.

There are other reasons for the concentration of financial institutions' lending at the urban periphery. Such lending may reflect the superiority of new suburban tracts because of the greater homogeneity and (hence) greater reliability of appraised values and lower administrative costs which go with handling similar items. Subdivisions are likely to be especially attractive for they allow the lender to deal in large amounts of money at a time. There is also a link between the financing of existing properties which relates back to the recent financing of new construction, for the builder-developer may work through the same institution in arranging finance for the first buyer(s).

One of the interesting features in Figure 3 is the lower degree of variance in institutional lending in newer subdivisions. By contrast, the scatter of points in tracts with 50 percent or more pre 1950 owned dwelling units is much greater. The effect of applying the weights described (page 16) above is less clear in this older section of the city. While it is likely that some individual tracts will change vertical position in the scatter, the overall distribution is unlikely to be altered. This is only
FIGURE 3. PERCENTAGE OF ALL FIRST MORTGAGES ON SINGLE DETACHED OWNER OCCUPIED DWELLING UNITS HELD BY FINANCIAL INSTITUTIONS BY PERCENTAGE OF OWNED DWELLING UNITS BUILT BEFORE 1950
METROPOLITAN TORONTO, 1971

Source: Statistics Canada, Census 1971. Enumeration Area Tape and User Summary Tape
speculation, however, and only applies to the scatter (and map) as a whole. Interpretation of smaller residential areas may be more markedly influenced by applying the weights.

While age of stock as a variable embraces many of the negative items on a professional lender's list, the increasing variability of mortgage holdings by financial institutions as the proportion of pre 1950 dwelling units increases, suggests the presence of other factors as well. Chief among these are dwelling value and neighbourhood quality. Map 1 shows, for example, that despite the age of the area, the probability of institutional lending rises to .6 and .8 in Rosedale and Forest Hill (despite generally lower turnover rates in these areas). The example of these higher income inner areas point to the importance of some combination of dwelling and neighbourhood quality together with high incomes of those demanding housing as factors influencing Institutional lending.

Property Value and Previous Ownership

Two further scattergrams cast light on this last point, one concerning the value of property, the other concerning the wealth level of current owners. The relationship between percentages of first mortgages held and median value of the single detached owner occupied dwellings in a census tract is clearly positive as Figure 4 shows, but highly variable nevertheless; $R^2 = 0.179$. This variability tends to increase with higher valued tracts.

A feature of the relationship captured by Figure 4 is the apparent presence of a lower bound to Institutional lending in lower valued tracts. Data points are absent in the upper left hand corner which, suggests the perception of higher risk associated with lower market values.
FIGURE 4. PERCENTAGE OF ALL FIRST MORTGAGES ON SINGLE DETACHED OWNER OCCUPIED DWELLING UNITS HELD BY FINANCIAL INSTITUTIONS BY MEDIAN VALUE OF ALL SINGLE DETACHED OWNER OCCUPIED DWELLING UNITS IN A CENSUS TRACT. METROPOLITAN TORONTO, 1971

Median Value of All Single Detached Owner Occupied Dwelling Units in a Census Tract

There is another component to lending, associated with characteristics of the borrower. Under normal lending practices, risks increase with the loan-to-value ratio. The lower the downpayment, the greater the unpaid balance of the loan relative to the expected value of the mortgage property. From the borrower's side, the loan-to-value ratio defines the strength of the homeowner's equity during the initial year of the mortgage. The larger the equity, the more the price of the property must decline before default rather than sale becomes rational for the home owner.

The ability of borrowers to meet downpayment requirements is an inducement to lend and may even be a factor partially off-setting vintage and low market value of the property. One proxy for wealth level is the incidence of previous home ownership and the scattergram of Figure 5 was constructed using such a variable. The scattergram shows a stronger relationship of percentage holding by financial institutions than does median house value; \( R^2 = .387 \) though, once again, the variability is also rather wide. (The simple correlation between median value and percentage of occupiers owning their previous dwelling is .628 or \( R^2 = .395 \)).

**Private Individual Lending**

Section 3 below will show that, compared to other Canadian cities, Toronto has one of the largest proportions of mortgage financing originating from Private Individuals.

The black shading in Map 2 shows that in eight census tracts, over 80 percent of all first mortgages on SDOO dwellings were held by Private Individuals. In 69 of the 311 tracts in the municipality, over 60% of first mortgages were held by Private Individuals. These are concentrated in the older housing stock, especially in areas associated with high levels of recent immigrant settlement. Far from reflecting the presence of the
FIGURE 5. PERCENTAGE OF ALL FIRST MORTGAGES ON SINGLE DETACHED OWNER OCCUPIED DWELLING UNITS HELD BY FINANCIAL INSTITUTIONS BY PERCENTAGE OF OWNER OCCUPIED OF ALL OWNED DWELLING UNITS WHO OWNED THEIR PREVIOUS RESIDENCE. METROPOLITAN TORONTO, 1971

recent dominance of financial institutions in the market as a whole, the
dominance of the private lender remains despite generally shorter lengths
of ownership (higher weights) in these areas.

But lending by Private Individuals is not confined solely to areas
of recent settlement. One might expect a priori that the more money that is
available to Private Individuals the greater the capacity and propensity to
make first mortgage loans in particular. This capacity will reflect the
equity which will vary directly with length of owner occupancy and for this
reason tends to be higher in older sections of the city. This is likely
to be one of the reasons that private lending tends to be highly correlated
with age of property.

The extent and numerical importance of the Private Individual is in fact
greater than suggested in Map 2. In the first place, lending by Financial
Institutions is likely to be biased away from the lower valued attached and
row housing, dwelling types which make up over thirty percent in the City
of Toronto (1971). Tracts with greater proportions of these housing types
will have proportionately greater mortgage investment by Private Individuals.

On the other hand, Financial Institutional lending may be more
heavily oriented towards rental accommodation, especially newer high rise
accommodation. The financing of the many small rental buildings and
converted single family dwellings may, however, draw heavily on Private
Individual finance, especially by vendors.

A second factor likely to underestimate the presence of Private
Individual lending is the fact that the maps are based solely on first
mortgages. Were the substantial number of second or junior mortgages to
be included (an additional 20 percent of the First Mortgage total for
MAP 2. MORTGAGE LENDING BY PRIVATE INDIVIDUALS. TORONTO 1971

The Percentage of First Mortgages on Single Detached Owner Occupied Dwelling Units Within Each Census Tract Held by Private Individuals

the CMA Core) the presence of the private lender would extend farther from the central city as well as being more intensive in existing shaded areas. Also with the development of private mortgage insurance the market for second mortgages will have become more attractive.

Other Lenders

The lender category termed Others is the most highly localized of the four types discussed in this paper. It occurs in the older "ethnic" areas in the western part of the city where in tracts bordering High Park on the east in particular, neither private nor institutional lending dominates. In the original census question, Credit Unions were cited as an example of "other lenders." While Credit Unions do not feature as strongly in the Toronto urban area as they do in other CMAs (see Section 3), they are important in particular sections of the city.

The class interval used in Map 3 has been adjusted to accommodate the fewer cases. In 18 tracts, between 15 and 35 percent of all first mortgages were held by "others" and these are clustered in clearly defined areas in the Western Inner City.

Credit Unions are relatively new entrants to the mortgage market; thus we would expect the distribution in Map 3 to be influenced by the distribution of turnover rates - tracts with a higher proportion of new buyers (borrowers) being more likely for temporal reasons alone to borrow from credit unions. Any account on purely geographic terms would have to take this factor into account. These temporal patterns may reflect particular lending policies of such institutions as Credit Unions or be tied to settlement patterns of particular ethnic groups.
MAP 3. MORTGAGE LENDING BY OTHER LENDERS. TORONTO 1971

The Percentage of First Mortgages on Single Detached Owner Occupied Dwelling Units Within Each Census Tract Held by Other Lenders

The three sources of mortgage finance: Financial Institutions, Private and Others do not exhaust all sources. The State also plays a role, though its precise position as a lender (as opposed to underwriter) has only been weakly documented in the literature to date.

Lending by Government

In Toronto under five percent of respondents of encumbered SDOO dwelling units cited government as the holder of their first mortgage. The accuracy of such a claim is hard to assess, since the question could be ambiguous to some respondents. The results in Map 4 ought to be interpreted carefully.

The overall impression is of the State's involvement in new as opposed to old housing and in this respect its direct mortgage lending activities, at least with respect to SDOO units, complement its role as an insurer of mortgages under the National Housing Act. As Figure 1 shows, the State too increased its holding of mortgages quite markedly in the 6 years prior to the 1971 census. On these grounds alone, newer dwelling units would be more likely to have their mortgages held by government. The 15-30 percent of lending in one tract in the inner city in Map 4 corresponds to the financing of older SDOO housing in association with the Alexandra Park Housing Project.
MAP 4. MORTGAGE LENDING BY GOVERNMENT. TORONTO 1971

The Percentage of First Mortgages on Single Detached Owner Occupied Dwelling Units Within Each Census Tract Held by Government

Section 3 is considered in two parts. The distribution of lending sources within each of the 24 urbanized areas is presented and this is followed by an explanation of the differences between this and the Central City of each urban area.

The essential differences in the way the market is organized by Urbanized Core of each (CMA) is given in Figure 6, which in turn is based on the data shown in Table 3. The figure displays the position of each of the Urbanized Cores with respect to three dimensions: the percentage of first mortgages on SDOO properties held by Financial Institutions, by Private Individuals and by the combined category of Other and Government.

The trigraph demonstrates the wide regional variations in the extent to which Financial Institutions are responsible for the major supply of mortgages to current home owners. Collectively, their share of the market ranges from 61.2 percent in the Quebec part of the Ottawa-Hull CMA Core (11), to 89.1 percent in the case of the Halifax CMA Core (4), with an average share of 72.2 percent.

At this stage we can only speculate on the causes of the observed patterns. The historical strength of the Credit Union movement in Quebec shows up in the relatively high values for Quebec, Hull, Chicoutimi and Montreal on the Government and Other dimension. The other cities which have high values are Regina and Saskatoon where co-operatives are strong and the provincial government participates. The service centres of the Atlantic provinces and the prairies (whether slow or fast growing) have the lowest level of participation by Private Individuals and the highest rates of Financial Institutional mortgages. They stand in contrast to some of the industrial/mining centres of Ontario and the West Coast cities of Vancouver and Victoria where private participation is as high as thirty
FIGURE 6
INTER AREA VARIATIONS IN SOURCES OF FIRST MORTGAGE FINANCE ON SINGLE DETACHED OWNER OCCUPIED DWELLING UNITS IN THE URBANIZED CORE OF 24 CMA's IN CANADA, 1971*

* The Index numbers for the Urbanized CMA Core's refer to cities listed in Table 3.

INTERAREA VARIATIONS IN SOURCES OF MORTGAGE FINANCE.
URBANIZED CORE CMA AND CITY. CANADA 1971.

### Table 3

**Fig. 6 Urbanised CMA Core**

<table>
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<th>Index</th>
<th>City</th>
<th>Bank</th>
<th>Private Others</th>
<th>Govt.</th>
<th>Bank</th>
<th>Private Others</th>
<th>Govt.</th>
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<td>3.4</td>
<td>6.7</td>
<td>60.9</td>
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<td>Kitchener</td>
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<td>72.7</td>
<td>12.7</td>
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</tr>
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<td>Sudbury</td>
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<td>3.3</td>
<td>9.3</td>
<td>65.7</td>
<td>21.7</td>
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<td>2.8</td>
<td>12.7</td>
<td>64.0</td>
<td>20.5</td>
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<td>Toronto</td>
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<td>2.2</td>
<td>3.7</td>
<td>37.6</td>
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<td>Vancouver</td>
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<td>4.8</td>
<td>6.4</td>
<td>63.5</td>
<td>28.2</td>
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<tr>
<td>22</td>
<td>Victoria</td>
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<td>22.1</td>
<td>2.2</td>
<td>8.5</td>
<td>55.2</td>
<td>34.3</td>
</tr>
<tr>
<td>23</td>
<td>Windsor</td>
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<td>6.5</td>
<td>61.2</td>
<td>30.3</td>
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<td>24</td>
<td>Winnipeg</td>
<td>68.7</td>
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<td>3.7</td>
<td>12.2</td>
<td>60.6</td>
<td>25.4</td>
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<td>Average</td>
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<td>4.5</td>
<td>9.4</td>
<td></td>
<td>71.4</td>
<td>24.8</td>
</tr>
</tbody>
</table>

NA = Not Available

Source: Statistics Canada. 1971 Census, Cat. 93-732, Tables 41 and 42.
percent (Windsor). The high percentage of private lending in Windsor with its dominant single industry highlights the importance which institutional mortgage lenders attach to the economic base of urban areas. The presence of strong Southern and Eastern European ethnic communities with internal sources of financing, as well as the City's relatively slow growth and high rate of outmobility, may also contribute to the high proportion of Private Individual lending in Windsor.

**Variations in Intra-urban Lending Patterns**

The most striking feature of the Toronto patterns was the way different sources of finance tended to prevail in different sections of the owner occupied housing market. The broad patterns obtained from the detailed mapping carried out for Toronto can also be investigated for other Canadian cities by comparing distributions of sources in the [urbanized core of the] CMA and the Central City of each urbanized area. The City in each case lies within the CMA core but is characterized by older housing and proximity to the central commercial district.

In most smaller CMA Cores, those with less than 100,000 dwelling units, there is little difference between City and Core. In the larger Metropolitan areas, however, patterns emerge similar to the Toronto case in direction if not in magnitude. Within the group as a whole it is the older cities, those with a larger proportion of vintage dwellings which slow closest approximations to the Toronto pattern. This can be seen in Table 4 where City-CMA Core differences by percentage of source are arrayed by size of CMA Core (as judged by the rank order of number of all dwelling units).
TABLE 4
DIFFERENCES IN THE SOURCES OF MORTGAGE FINANCE BETWEEN CMA CORE AND CITY, SELECTED CMAs CANADA 1971.

<table>
<thead>
<tr>
<th>CMA Core</th>
<th>Deviation of City Percentage from CMA Core, (City - CMA Core)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Financial Institutions</td>
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<tr>
<td>Montreal</td>
<td>-9.1</td>
</tr>
<tr>
<td>Toronto</td>
<td>-34.5</td>
</tr>
<tr>
<td>Vancouver</td>
<td>-5.0</td>
</tr>
<tr>
<td>Winnipeg</td>
<td>-8.1</td>
</tr>
<tr>
<td>Ottawa-Hull</td>
<td>2.8</td>
</tr>
<tr>
<td>Hamilton</td>
<td>-4.8</td>
</tr>
<tr>
<td>Quebec</td>
<td>-8.3</td>
</tr>
</tbody>
</table>

Note: Edmonton and Calgary have been excluded, as their Central City and CMA Core are virtually identical.

Source: Statistics Canada. 1971 Census Cat. 93-732.
Inspection of Table 4 reveals that the unique position of Toronto cannot be denied. The lack of lending by Financial Institutions and the predominance of Private Individual lending in the inner city noted above is reflected again in the difference between the City of Toronto and the CMA Core. Some centrifugal tendencies in lending by Financial Institutions within urban areas is also apparent in Montreal, Quebec and Winnipeg, and to a lesser extent Vancouver and Hamilton. As expected, in Quebec cities' inner city lending is more likely to be handled by the Credit Unions.

This last section has shown a wide variation in sources of finance and in geographical emphasis within urban areas. There is considerable potential for making further use of cross city comparisons in any generalization regarding lending behaviour of Financial Institutions. For example, do similar types of neighbourhoods in different cities draw on a different set of mortgage suppliers and, if so, why? Are we witnessing historical conditions primarily, or simply differences in perceived risk by major lenders, both with respect to the city concerned and the areas within it? Perhaps what is most important is recognition that studying the intraurban pattern of mortgage investment alone is insufficient; capital is highly mobile geographically and the set of major Metropolitan areas might provide the most appropriate scale over which to perform analysis of the mortgage market.

CONCLUDING COMMENTS: CHANGES SINCE 1971

This paper explores the way different suppliers of mortgage finance lend geographically. The distribution of holdings of first mortgages on single detached owner occupied properties in the Municipality of Toronto in 1971 reveals several distinct patterns.

The concentration of holdings by Financial Institutions on suburban
MORTGAGE LOANS OUTSTANDING BY LENDING INSTITUTIONS AND GOVERNMENT ($ log millions)

Source: CMHC, Canadian Housing Statistics, various years.
branch system which is characteristic of the depository institutions, may have a special local impact. The manager of a bank or trust company branch, or of a local credit union is much more likely to take a collection of services approach to his retail customers than is a life insurance company or a pension fund. The point made by Poapst in this regard (personal communication) is therefore an important one, for the more the customer becomes the focus rather than the activity, the more stable becomes the supply of institutional funds for lending on existing properties. One of the implications of a more steady supply of such funds is that any observed fluctuation in institutional mortgage lending, both spatially and temporally, will be more likely to reflect fluctuations in demand for mortgage loans rather than their supply.

This last observation is a logical extension from the empirical observation that the market is characterised by quite different types of lenders and different kinds of borrowers who operate in fairly distinct and separate parts of the urban area.

Before we can argue for the existence of spatially defined mortgage submarkets as opposed to different levels of spatial concentration by different lenders, it is necessary to ask a further set of questions.

1. How do interest rates, downpayment rates and terms vary over the different residential areas in the local housing market?

2. Is this variation clearly associated with different lender groups as implied in the maps in Section 2?

3. To what extent do Financial Institutions, Credit Unions and Private Individuals compete for similar buyers in the mortgage market? Or, alternatively, to what extent do they complement one another by serving buyers with quite different financing requirements?
4. Given the short run volatility of the housing market, do each of these suppliers behave in the same way over time? For example, is the elasticity of supply of mortgage credit with respect to change in mortgage interest rates the same in each group? If not, and item 3 above reveals complementarity, then which house buyers suffer relatively during times of shortages in mortgage money?

5. A similar question may be asked of suppliers' responses to changes in buyer characteristics; does each respond similarly, for example, to changes in the wealth levels of buyers in an area?

These questions imply that we must move from purely descriptive patterns introduced in this paper to an explanatory model. Such a model should allow insights into the spatial distribution of lending patterns observed in Maps 1 and 2 in particular and should be constructed in such a manner as to be useful in consideration of local as well as national housing policy, especially that which relates to the inner city. This we see as a task for the future.
APPENDIX 1

THE DATA AND THEIR ACCURACY

Data for this study were drawn from three different sources: Census Tract Bulletins, User Summary Tapes and Enumeration Area Tapes; all supplied by Statistics Canada. The census questions from which maps in the text were drawn are reproduced below.

Mortgage Questions Asked in the 1971 Census

The following question was asked of a one third random sample of households who owned and lived in their dwelling in 1971:

Question H23 reads:

Is there a mortgage on this dwelling?

Answers are selected from,

Yes, first only,
Yes, more than one,
No.

If the respondent answered yes to question H23 then he/she was asked question H24 which reads:

Who holds the First Mortgage?

With possible answers being,

Bank or Insurance, Loan, Trust or Mortgage Company,
Government (Federal, Provincial or Municipal),
Private Individual,
Other (Credit Union etc). (Statistics Canada, 1971 Census of Canada Questionnaire, 2B, p. 5).

The responses to the questions are released to the public for SDOO dwellings only and at the Enumeration Area level and the City and CMA level.
Accuracy of the Data

Maps 1 through 4 in the text were constructed by aggregating the responses to the two census questions from the Enumeration Area to the census tract level. While this is technically a straightforward procedure, one of the concerns expressed has to do with aggregation error resulting from summing randomly rounded Enumeration Area totals. (Statistics Canada, Census Division, Census Data News, Vol. 1, No. 4, pages 3 and 4 contain a discussion of this point).

Inspection of the first 47 Census Tracts from our own data (Table Al.1) reveal that discrepancies between Bulletin figures and those aggregated from Enumeration Areas do occur. However the magnitudes are not great. Over the 35 tracts illustrated in Table Al.1, the average number of mortgaged SDOO dwelling units for the Bulletin figures was 82 and for the Enumeration Area aggregates, 77. The average discrepancy at the census tract level between these two sources was 6.1 percent. Inspection of the individual figures in Table Al.1 will serve to emphasize the warning given by Statistics Canada (Op. Cit.) regarding the loss of accuracy in the case of very small numbers. This is one of the reasons why only census tracts with 25 or more mortgaged SDOO dwellings were employed in the analysis.
TABLE A1.1

AN EXTRACT FROM THE DATA USED TO TEST THE DISCREPANCIES BETWEEN CENSUS TRACT BULLETIN TOTALS OF THE NUMBER OF MORTGAGES SINGLE DETACHED OWNER OCCUPIED DWELLINGS AND AGGREGATIONS OF ENUMERATION AREA TOTALS

<table>
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<th>Census Tract</th>
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<td>Enumeration Area Aggregates</td>
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APPENDIX 2
MULTIPLE REGRESSION ANALYSIS

The purpose of this appendix is to report the results of a simple location model of mortgage lending. The results are confined to the appendix because of the primitive state of the model. At present we lack an adequate conceptual model, on which to justify even a reduced form location model of mortgage holdings. Secondly, we lack suitable data with which to measure adequately even those variables which we know to be the most important in accounting for the spatial distributions we observe. What we report, however, is a step towards dealing with both these problems.

In the model below we hypothesize that the probability that any loan will be made by a Financial Institution is a function of the characteristics of the property and the borrower. Ideally, explicit price terms would be present in a structural model of the supply and demand sides of the market. Like other variables we would like to have, the price and cost terms to borrower and lender remain implicit and correlated with variables in the model to follow.

Age of the dwelling unit is used to represent the salient characteristics of the property and median value to reflect the income and wealth

* There are several studies of mortgage lending which analyse data from U.S. cities. While the context may be different, the methods used as well as some of the analytic modelling may be applicable to the analysis of Canadian lending patterns; indeed a comparison of results of similar models estimated in the U.S. and Canada may be very instructive. A number of U.S. studies are based on the analysis of aggregate data: For example see Ahlbrandt (1977), Hutchinson and Reed (1977) and Nickerson (1979).
characteristics of the borrower. Moreover, since these two sets of characteristics are highly correlated by location, and the joint occurrence of borrower and property characteristics are especially important in the lending decision, the model is specified in terms of interaction variables.

The interaction variables were constructed on the basis of the cross-tabulation given in Table A2.1. The numbers represent the number of census tracts in each category. Those in parentheses refer to the overall percentage. Hence in the case of cell AV21, 23 tracts take on the value 1; other tracts take on the value zero. Variables were entered in linear form.

The model estimated is

\[ PFI_i = \alpha + \beta_1 AV12_i + \beta_2 AV13_i + \beta_3 AV21_i + \beta_4 AV23_i + \beta_5 AV31_i + \beta_6 AV32_i + \beta_7 AV33_i + \epsilon_i \]

where \( PFI_i \) is the percentage of first mortgages held on SDOO dwelling units in the \( i \)th census tract by Financial Institutions in 1971. The variables AV12 through AV33 are as defined in Table A2.1.

The variable A22 is selected as the base, thus under this model the coefficient \( \beta_7 \) would be interpreted as the estimated effect of the combination of new dwellings (80-100 percent being built after 1950) and high value (over $35,000 median value in a tract) on the probability that a Financial Institution will hold a mortgage loan on a SDOO dwelling unit in such a tract. Alternatively \( \beta_7 \) may be more broadly interpreted as the combined effect of a low risk security and a credit worth borrower.

Applying the same reasoning to the seven combinations of property and "borrower characteristics" as set forth in Table A2.1 leads to the following expectations:
TABLE A2.1

PERCENT OF PROPERTIES BUILT BEFORE 1950 IN THE CENSUS TRACT BY SELECTED CATEGORIES OF MEDIAN VALUE OF SINGLE DETACHED OWNED OCCUPIED DWELLING UNITS. METROPOLITAN TORONTO, 1971.

<table>
<thead>
<tr>
<th>Percent of All Owned Dwellings Built Before 1950(A)</th>
<th>Median Value of SDOO Dwelling Units in Census Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤$27,000</td>
</tr>
<tr>
<td>0-10 percent</td>
<td>0</td>
</tr>
<tr>
<td>(20.3%)</td>
<td></td>
</tr>
<tr>
<td>10-80 percent</td>
<td>23</td>
</tr>
<tr>
<td>(7.4)</td>
<td></td>
</tr>
<tr>
<td>80-100 percent</td>
<td>37</td>
</tr>
<tr>
<td>(11.9)</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>146</td>
</tr>
<tr>
<td>(100%)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistics Canada, User Summary Tapes and Bulletin, Cat 95-951, Series B, Table 2.
Results of the Regression Analysis

The results for two models are given in Table A2.2—the estimates for Private Individuals being included for comparison. The estimated coefficients in the Table A2.2 give the effect which properties in different age-value categories have over a specified base category with respect to the probability that a first mortgage loan will be held by a Financial Institution. In general, the older the stock and the lower the value of the area, the lower the probability that a first mortgage would be held.

A loan surface over a more functional or substantively interpretable space than pure geographical space can be constructed using these estimates. The relative measures are represented graphically in Figure A2.1 by normalizing the coefficients and placing them on the age-value grid.

The surface suggests that the effect of neither age nor value is linear with respect to the probability of Institutional lending, nor is the effect of age or value unconditionally related to the propensity to lend: in other words, there are interaction effects. The marginal effect of age (given value) on the probability of loans being held appears to be greater than the marginal effect of value, given age.

Each of these results is consistent with what we know about the determinants of loan decisions: that the characteristics of the security is the major factor of importance in loan origination, that only after some relatively high income and wealth (and confounding but complementary effects of higher dwelling value and neighbourhood quality) will the
TABLE A2.2

THE EFFECT OF PROPERTY AND BORROWER CHARACTERISTICS VARIABLES ON THE PROBABILITY OF FINANCIAL INSTITUTIONS AND PRIVATE INDIVIDUALS HOLDING FIRST MORTGAGES ON SINGLE DETACHED OWNER OCCUPIED PROPERTIES IN A CENSUS TRACT. TORONTO, 1971

<table>
<thead>
<tr>
<th>Variable</th>
<th>Financial Institutions</th>
<th>Private Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See Table A3.1)</td>
<td>Coefficient</td>
<td>Standard Error</td>
</tr>
<tr>
<td>AV12</td>
<td>28.06</td>
<td>2.86</td>
</tr>
<tr>
<td>AV13</td>
<td>33.29</td>
<td>2.93</td>
</tr>
<tr>
<td>AV21</td>
<td>-14.28</td>
<td>3.62</td>
</tr>
<tr>
<td>AV22(constant)</td>
<td>51.42</td>
<td></td>
</tr>
<tr>
<td>AV23</td>
<td>9.76</td>
<td>3.67</td>
</tr>
<tr>
<td>AV31</td>
<td>-21.87</td>
<td>3.19</td>
</tr>
<tr>
<td>AV32</td>
<td>-25.10</td>
<td>2.98</td>
</tr>
<tr>
<td>AV33</td>
<td>-7.06</td>
<td>3.43</td>
</tr>
</tbody>
</table>

| R²       | .74                    | .75                 |
| S.E.     | 13.42                  | 12.69               |
| Mean of DV | 55.43             | 38.82               |
| SD of DV | 26.45                  | 25.17               |
| N of Cases | 311                | 311                 |

S.E. = Standard error  S.D. = Standard deviation
D.V. = Dwelling value
FIGURE A2.1

THE EFFECT OF AGE OF PROPERTY AND MEDIAN VALUE ON THE

PROBABILITY OF A FIRST MORTGAGE LOAN BEING

HELD BY A FINANCIAL INSTITUTION

![Bar chart showing the effect of age of property and median value on the probability of a first mortgage loan being held by a financial institution. The x-axis represents median value categories (<$27,000, $27-35,000, >$35,000) and the y-axis represents the probability of holding a first mortgage (0-100). The chart includes bars indicating the probability at different age ranges (80-100, 10-80).]
negative effect of factors associated with age alone be reduced; maintenance levels in particular rise with initial quality of the dwelling and the higher incomes of most inhabitants of high valued dwelling units.

The same model was estimated for first mortgages held by Private Individuals and the coefficients, also reported in Table A2.3, are quite consistent with what we observed in Maps 1 and 2 in the text. Except for the newer dwelling units, especially those of high value, the coefficients on the Private Lender model simple have the reverse signs to those on the Institutional lending model. The coefficients are graphed in Figure A2.2.

The Regression Model and Census Tract Data. A Comment

While the foregoing analysis has at least given quantitative support to our visual inspection of the maps in the text, we have only begun to estimate the parameters of the mortgage lending which we ultimately seek. While improved specifications are possible with existing census data, it is doubtful whether census tract data alone can take us that much further.

Some of the limitations of census tracts are well known, including the cumulative nature of holdings problem discussed in the text. An additional important inadequacy occurs when the dependent variable refers to a subset of all dwelling units in a tract, in this case quite a small subset, SDOO with first mortgages. Few independent variables used here, or others available, refer exactly to the same subset of dwelling units in the tract, and none covers exactly the same subset as the dependent variable. Median value includes additional SDOO properties held freehold and age of owned dwelling refers to an even larger additional set within each tract, including semi and fully attached owned units. Unless special statistics are obtained which allow a one-to-one mapping of the relevant sample used in each tract
FIGURE A3.2
THE EFFECT OF AGE OF PROPERTY AND MEDIAN VALUE ON THE
PROBABILITY OF A FIRST MORTGAGE LOAN BEING
HELD BY A PRIVATE LENDER
for each variable, the estimates from so called ecological correlations (even if weighted regression is used) cannot be satisfactorily interpreted even with a fully and accurately specified model.
REFERENCES


Statistics Canada 1971. Census of Canada Questionnaire 2B.


