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Consumer information search for home mortgages: who, what, how much, and what else?☆

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1. Introduction

A prerequisite for consumers to make good decisions is to have all the relevant information about the decision at hand, and therefore mandatory information disclosure is often adopted as a public policy remedy to assist consumer decision making (Durkin & Elliehausen, 1990; OCED, 1992). In the consumer mortgage loan market, the Truth in Lending Act (P.L. 90–321; 15 USC §1601) and the Real Estate Settlement Procedures Act (P.L. 93–533; 12 USC §2601) require such mandatory disclosure of information (Federal Reserve Board, 1997; Retsinas, 1997).

Unlike the well-acknowledged role of information *per se,* our understanding of consumer information search behavior when shopping for credit, such as a mortgage loan, is very limited (Lee & Hogarth, 1999a). Addressing this issue, the purpose of this study is to investigate how consumers search for information, particularly when looking for a home mortgage loan. The insights gained from this analysis will guide us to more effective ways to help consumers choose a mortgage loan, and, as a result, improve market efficiency and effectiveness.

The remainder of the paper is structured as follows. First, we present background information related to mortgage markets, followed by a review of previous studies on

☆ The analysis and conclusions set forth in this paper represent the work of the authors and do not indicate concurrence of the Federal Reserve Board, the Federal Reserve Banks, or their staff.

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mortgage shopping behavior. Then, using data from the 1997 University of Michigan's Survey of Consumers, we identify consumers' information search patterns when shopping for a mortgage loan. Specifically, we examine the interdependence of information search activities, providing further insights on consumer search behavior. Finally, we provide a discussion for the research and consumer outreach communities.

2. Background

Both the Truth in Lending Act (TILA) and the Real Estate Settlement Procedures Act (RESPA) mandate information disclosure related to home mortgage loans. The main objectives of the statutes are to aid consumers in making informed credit decisions and to promote price competition by facilitating consumers' comparison-shopping.

Although the idea of price disclosure is simple, TILA and its implementing regulation, Federal Reserve Regulation Z, have grown to require an extensive list of information. The "Fed box" disclosures include the annual percentage rate (APR), finance charge, amount financed, and total of payments. Disclosures about credit report fees, flood insurance, origination fees, credit life insurance, and numerous other charges are also required if they are necessary to obtain the loan.

RESPA is administered under Regulation X from the Department of Housing and Urban Development (HUD) (Meier & Garman, 1995; Retsina, 1997). The Act contains both disclosure and substantive provisions. It requires that certain disclosures be given at various points in mortgage transactions to ensure that consumers receive timely and useful information about the costs associated with the transaction. Under RESPA, within three days of application, lenders are required to provide the mortgage loan borrowers with a good-faith estimate of closing costs and an information booklet explaining the settlement statement.

While information related to mortgage loans is fully available as required under TILA-RESPA, several researchers point out that consumers often lack understanding of disclosed information in the mortgage loan market (Lee & Hogarth, 1999b; Chang & Hanna, 1992; Thakor, Beltz & Barefoot, 1993). This lack of understanding stems from the complexity of financial information disclosed as well as the proliferation of product choices available (Kimball, Frisch & Gregor, 1997). For example, many mortgage lenders offer a wide variety of mortgage products including fixed or variable rates or some hybrid of the two, varying terms to maturity, and different combinations of rate and points. Because the details of transactions may differ substantially, the disclosed information may not always permit easy comparisons. The language of the creditor is also difficult to understand for many consumers (Chang & Hanna, 1992), and very few people in fact understand the APR (Lee & Hogarth, 1999b).

The timing of the information disclosures may also compound difficulties in comparisons. When shopping, consumers are often quoted a contract interest rate and points plus fees; the APR—the metric for loan-to-loan comparisons—is not required to be disclosed until three days after application. While this delay enables financial institutions to provide an accurate APR, it means consumers must actually apply for a loan—a step usually considered as the culmination of the shopping process—before they know the "true" interest rate.

3. Literature review

3.1. Consumer mortgage shopping behavior

In the real estate finance literature, consumers' choice of a mortgage loan is conceptualized as a function of the loan-to-value ratio, the likelihood of prepayment, the points-interest-rate tradeoff and the type mortgage sought (fixed or adjustable). Sources of uncertainty, including future interest rates, housing prices, and general economic conditions, are other factors in the mortgage decision (Follain, 1990). Previous researchers have tended to focus on only one dimension of the decision. Yang (1992), for example, focused on estimating the points-interest-rate trade-off for both purchase money and refinancing mortgages. Lino (1992), on the other hand, focused on consumers' choice of a fixed or adjustable rate mortgage based on the consumers' assessment of interest rate risks. It is, however, critical to investigate all the elements of a loan to obtain a full understanding of consumer shopping behavior for a mortgage loan.

Stigler's (Stigler, 1961) seminal work on the economics of information provides a theoretical basis for consumer's information search behavior when faced with choosing a home mortgage loan. According to Stigler, market price dispersion is the major reason for consumers to engage in information search. Consumers can close price gaps by searching for price information, but at some cost in terms of time and money. A consumer will search for lower prices as long as the marginal benefits from additional search exceed the marginal costs of search.

Chang and Hanna (1992) discussed the benefits and costs of search for credit (general credit, not specific to home mortgage loans). Immediate benefits include lower interest rates and finance charges; indirect benefits include better money management, greater savings and convenience from using appropriate credit, and gains in financial knowledge and experience gathered from the search process. The costs of search include the opportunity cost of time and physical and mental effort spent in search process. They noted that in today's complex financial market, the cost of information search may be much greater for a money borrower than a goods buyer because the cost of this service is often not fully or clearly disclosed until the time of application.

Lee and Hogarth (1999b) showed that many consumers are confused about the price of a home mortgage loan as measured by the difference between the contract interest rate and the APR. Also, the terms used with closed-end credit products may be more complicated than those used in open-end credit products, such as credit cards.

Psychological dislike or enjoyment of search influences consumers' perception of the benefits and costs of search (Babin, Darden & Griffin, 1994). Also, "high-risk" consumers may be less willing to engage in search in order to avoid being turned down. On the other hand, if they are turned down or obtain a smaller loan than needed, they may be forced to engage in further search activities.

It might be important to distinguish between information search behavior by refinancers and other mortgage borrowers, since their behaviors are governed by different situations. Unlike purchase-money mortgage borrowers whose home buying activities compete with their time devoted to mortgage shopping activities, refinancers usually have a longer lead time and more flexibility to engage in information search activities. Refinancing also suggests that consumers have experience with the mortgage loan process at least once with their current mortgage, unlike first time homebuyers. On the other hand, compared with refinancers, homebuyers have more recent exposure to real estate agents who may serve as an information and referral source.

Refinancing has been cast as an information asymmetry problem, with consumers knowing when (i.e., under which conditions) they will refinance; lenders are assumed not to have this information (Yang & Maris, 1993). Refinancing is posited to be a function of mortgage value, ability to repay, amount of equity, and credit worthiness, all within an exogenous interest rate environment (Bennnett, Peach & Peristiani, 2000). Dickinson and Heuson (1993) also include personal decisions as reasons for refinancing in their model of refinancing decisions. Thus, borrowers with similar loans react differently to the same market stimulus.

In a 1999 survey sponsored by the Mortgage Bankers Association of America (MBA), respondents overwhelmingly cited using the phone as their favorite method to obtain information on mortgages; personal contact was the second-most cited method (Duncan, 1999). Friends and family members were the most-often cited source of information, followed by ads and real estate professionals; for refinancers, experience was also cited as a source of information. The MBA study also asked consumers what terms and conditions they compared. Four-fifths shopped for "interest rates" (Duncan notes especially that they did not say "APR"), 23% asked about fees, 8% asked abut the type of loan and payment schedule, and 3% asked about documentation requirements. Half of respondents shopped three or more lenders, while "less than 30% shopped only one lender" (Duncan, p. 47). While half of the respondents contacted mortgage brokers and one third contacted mortgage lenders, Duncan indicates that there was "massive confusion" on the part of the respondents as to which was which.

3.2. Consumers' information search pattern

Most previous researchers defined information search either explicitly or implicitly as "the degree of attention, perception, and effort directed toward obtaining environmental data or information related to the specific purchase under consideration" (Beatty & Smith, 1987, p. 85). Information search behavior can be also distinguished as either internal or external (Beales et al., 1981). Internal information search refers to consumers' retrieval of memory – knowledge from previous search, experience with products, or passively acquired information during normal daily activities. External information search behavior includes consulting with friends, family, expert consumers, sellers, and third-party experts, reading books, magazine articles, consumer ratings, advertising, and direct inspection.

Consumers gather information from a variety of different sources. Although a variety of different taxonomies of external information sources has been introduced, the sources of information can be classified into direct inspection, seller-provided, personal (family and friends), and third party. Seller-provided information has been further categorized into direct-from-seller and advertisements. The major sources of information when shopping for a home mortgage loan include financial institutions such as banks, savings and loans, credit unions, mortgage companies, and other financial institutions, advertisements, third-party generated information such as ratings, information from real estate professionals (especially in the case of first-time home buyers), and family and friends.

Information search is difficult to quantify. Over the last three decades hundreds of articles have been published, and numerous measures of search have been used, including both single aspects of search behavior and aggregate measures of search (see Lee & Hogarth, 2000 for a review of measures of search). While some researchers used multiple measures in their study, most researchers employed only one or two measures, failing to capture all the aspects of information search. Given that interdependencies among different search activities are not known, some aspects of search may have been ignored. Consequently, conflicting results are obtained, and we do not know if the discrepancies are due to different measures or to different behaviors.

Information search activities might be interdependent (e.g., using information from third-party sources may discourage consumers from obtaining information from advertisements). In fact, several researchers have already suggested that there is a need to consider the interrelationships among various information sources in designing information programs. For example, Smith (1993) suggested that advertising influenced how consumers interpret other product-related information. Furthermore, consumers' confidence in their existing information or knowledge may influence how much they search for additional information and the information sources they seek out. However, overconfidence in their knowledge, and the calibration of that knowledge, may lead some consumers to do less-than-optimal searching (Alba & Hutchinson, 2000). More broadly, previously acquired information in external search may influence additional search activities as well as how consumers interpret the information from that search.

Addressing this issue, we examine potential interdependencies among information search activities using single and composite measures of information search. Specifically, we investigate the following research questions:

> How do consumers search for information when choosing a home mortgage? Who do they get information from? What terms and features do they search for? How much information do they seek out?
> Are there any interdependencies among these information search behaviors? When using a particular information source, what other sources do consumers use? When searching for a specific term, what else do they search for?

4. Methods

4.1. Data

The Surveys of Consumers were initiated in the late 1940s by the Survey Research Center at the University of Michigan. The purpose of these surveys is to measure changes in consumer attitudes and expectations with regard to consumer finance decisions. Each monthly telephone survey of 500 households includes a set of core questions covering consumer attitudes and expectations along with socioeconomic and demographic characteristics (see Curtin, 2001 for more information).

In February and March 1997, the Federal Reserve Board commissioned additional questions on the Surveys of Consumers, including specific questions on consumers' information search behavior when shopping for a home mortgage. In particular, we asked the number and type of lenders contacted; the number and types of information sources used in mortgage shopping; and the number and types of loan terms and features used in comparison-shopping. For these surveys 1,001 households were interviewed by telephone. Among those, only the respondents who applied for or refinanced a home mortgage loan (that is, shopped for a primary mortgage) during the past five years are included in this analysis (N = 219; a demographic profile of the sample is provided in Table 1). For some analyses, we will be able to separate refinancers from "other mortgage borrowers"; however the data do not allow us to determine if these other mortgage borrowers are first time home buyers, other purchase money mortgage borrowers, or some other category of mortgage borrower. Households who indicated they obtained home equity loans are not included, although some refinancers may have taken some cash out of their homes as part of the refinancing. For example, if a borrower had \$100,000 remaining on the mortgage and had a home worth \$150,000, the refinancing could have been for \$120,000 – \$100,000 to pay off the former mortgage and \$20,000 in cash for some other purpose. Again, the data do not allow us to determine the pure refinancers from the cash-out refinancers.

4.2. Measures

The following questions were asked to identify consumer's search behavior when shopping for a home mortgage.

Number of Lenders Contacted refers to the number of different lenders or brokers a respondent contacted before applying for the mortgage (Srinivasan & Ratchford, 1991). It is a continuous variable.

Source of Information reflects where a respondent obtained information. Respondents were asked what sources of information they used when shopping for a mortgage loan. Each source of information was prompted.

- Banks, Savings and Loans, or Credit Unions
- Mortgage company
- Other financial institutions
- Real estate agents
- Advertisements – TV and newspapers
- Comparative ratings published in newspapers, magazines, or internet
- Friends or relatives

A set of binary variables was created to indicate whether each of the above particular sources of information was used (1 = used; 0 = did not use).

Number of Information Sources Consulted was then constructed by summing the number of the above information sources used.

Table 1
Profile of sample

Demographic characteristics	Respondents who applied for a home mortgage past 5 years (not refinancing)	Respondents who refinanced a home mortgage past 5 years	All respondents
Age[1]			
18–24	6.1%	3.4%	9.2%
25–34	35.9%	13.6%	22.1%
35–44	32.8%	46.6%	24.9%
45–54	18.3%	26.1%	18.0%
55–64	3.8%	6.8%	8.7%
65 or older	3.1%	3.4%	17.0%
Education[1]			
Less than high school	3.1%	0.0%	10.6%
High school graduate	25.2%	25.0%	31.5%
Some college	19.9%	34.1%	21.2%
College degree or more	50.3%	49.8%	34.6%
Income[1]			
Under $10,000	1.5%	0.0%	5.4%
$10,000–19,999	5.3%	4.6%	13.7%
$20,000–29,999	9.9%	6.8%	13.7%
$30,000–39,999	12.2%	9.1%	12.9%
$40,000–49,999	8.4%	13.6%	9.7%
$50,000–59,999	16.8%	13.6%	9.0%
$60,000–74,999	12.2%	21.6%	10.5%
$75,000–99,999	9.9%	11.4%	6.1%
$100,000 or more	19.9%	18.1%	10.3%
below $35,000 (n.e.c.)	0.8%	0.0%	0.9%
above $35,000 (n.e.c.)	0.8%	0.0%	0.7%
Race/ethnicity[1]			
White except Hispanic	84.0%	89.8%	78.2%
Black except Hispanic	3.1%	4.6%	8.1%
Hispanic	4.6%	3.4%	6.8%
Others	5.4%	1.1%	3.6%
Marital status[1]			
Married	72.5%	75.0%	57.4%
Separated/divorced	11.5%	15.9%	13.5%
Widowed	2.3%	1.1%	8.7%
Never married	13.0%	6.8%	19.6%
Region			
West	22.9%	25.0%	21.3%
Midwest	31.3%	28.4%	26.9%
Northeast	15.3%	14.8%	18.7%
South	30.5%	31.8%	33.2%
Number	131	88	1001

[1] Percentage doesn't add up to 100% due to missing information.
n.e.c., not elsewhere classified.

Terms Compared. Respondents were asked what loan terms and features they compared when shopping for a home mortgage loan. Each term was prompted.

- Interest rates
- Whether the interest was fixed or variable
- Points or origination fees
- Mortgage broker fees
- Application fees
- Annual percentage rate
- Monthly payment amounts
- Optional credit life insurance
- Other fees, such as late payment fees
- Other terms

A set of binary variables was created to indicate whether each of the above particular terms and features was compared (1 = compared; 0 = did not compare).

Number of Terms Compared was then constructed by summing the number of the above terms compared (Ozanne, Brucks & Grewal, 1992).

Extent of Search. Respondents were asked how much comparison shopping they did when they last applied for a home mortgage loan or refinanced their mortgage (Srinivasan & Ratchford, 1991). The response to this question was on 5-level likert-type scale, ranging from almost no shopping (1) to a great deal (5).

4.3. Analysis

After performing an initial descriptive analysis, we began exploring interdependencies among of information search activities. First, we examined the interdependencies among the information sources consulted and among the loan terms and features consumers compared, using log-linear models. Log-linear models treat all variables as response variables and are most appropriate when the focus is on statistical independence/dependence among variables. We performed log-linear model analysis using the SAS CATMOD (Categorical Data Modeling) procedure. The CATMOD procedure allows the examination of interactions, and the likelihood ratio indicates the goodness of fit of the tested model. Log-linear modeling procedures begin by estimating the most complex interaction model that incorporates all the possible interaction terms and then iterating to find the model with the best fit by eliminating insignificant interaction terms. For the information sources model, we began by examining 10-way interactions, then 9-way interactions, 8-way interactions, and so forth. For the loan terms and features model, we began by examining 9-way interactions, and iteratively worked through 8-way, 7-way, and so forth. Finally, interdependencies among the composite measures (number of lenders contacted, number of sources consulted, number of terms compared, and perceived extent of search) were examined using correlation analysis.

5. Findings

5.1. Information search

5.1.1. Who do consumers get information from?

Consumers' information search behaviors varied a great deal (Table 2). About one-fourth (23%) of other mortgage borrowers contacted only one lender compared with only one in seven (14%) of refinancers who contacted only one lender. The mean and median number of lenders compared were 4 and 3, respectively for all mortgage borrowers; there was no statistical difference between refinancers and other borrowers with regard to number of lenders contacted ($p = 0.65$).

An average consumer obtained information from two sources. Lenders, specifically, banks, savings and loans, and credit unions, were the most popular sources for information. While there was no difference between refinancers and other mortgage borrowers in terms of the total number of information sources consulted ($p = 0.90$), some notable differences were found with regard to the use of specific sources of information. Understandably, larger proportions of other mortgage borrowers (vs. refinancers) obtained information from real estate agents, (29% and 8%, respectively). First-time homebuyers and purchase-money borrowers (included in the other mortgage borrowers category) often have a limited time frame (usually two weeks, included in the purchase offer contract) in which to apply for mortgage. Also, homebuyers are more likely to be working with a real estate professional than a homeowner who is refinancing. Refinancers were more likely to look for information from advertisements compared with other mortgage borrowers (26% vs. 13%, respectively).

5.1.2. What terms and features do consumers search for?

A greater proportion of refinancers reported examining a wider range of terms compared with other mortgage borrowers, although these differences were not statistically significant. Most consumers (78%) compared some aspect of interest rates (i.e., interest rate or APR), type of loan (i.e., fixed or variable rate; 76%), and fees (i.e., points or origination fees, application fees, mortgage broker fees; ranging from 54% to 65%). Only a quarter of mortgage borrowers compared optional credit life insurance and other fees, such as late payment fees. The mean and median numbers of terms considered were 5.9 and 6, respectively.

5.1.3. How much information do consumers seek out?

Two-fifths (40%) claimed to do almost no searching or only a little searching; about one-third (32%) reported doing a moderate amount of search and over one-fourth (28%) claimed to do a lot or a great deal of searching. Recall that the median number of loans compared was 3 and the median number of terms and features considered was 6. It is evident that consumers consider this a "little" or a "moderate" amount of search, but at the median this requires consumers to process 18 pieces of information (6 features on 3 loans).

Table 2
Information searched

	Other mortgage borrowers	Refinancers	All mortgage borrowers
Number of lenders contacted			
1	22.8%	13.8%	19.2%
2–3	32.3%	44.8%	37.4%
4–5	27.5%	20.7%	24.8%
6–9	12.6%	13.8%	13.1%
10–20	4.7%	6.9%	5.6%
Mean	3.95	4.15	4.03
Median	3	3	3
Source of information			
Obtained info from (multiple responses allowed)			
Banks, S&Ls, Credit Unions	56.1%	63.6%	59.2%
Mortgage company	34.6%	42.1%	37.6%
Other financial institution	6.9%	10.2%	8.3%
Real estate agent***	29.3%	8.0%	20.6%
Advertisements—television & newspapers**	13.1%	26.1%	18.4%
Comparative ratings—newspapers, magazines, or internet	22.3%	18.2%	20.6%
Friends or relatives	30.8%	23.9%	28.0%
Total number of sources considered			
Mean	1.95	1.92	1.94
Median	2	2	2
Specific terms compared (multiple responses allowed)			
Interest rate	78.9%	85.2%	78.4%
Fixed or variable interest rate	72.9%	81.6%	76.4%
Points or origination fees	62.3%	70.1%	65.4%
Mortgage broker fees	52.8%	56.8%	54.4%
Application fees	60.5%	60.2%	60.4%
APR	68.2%	78.2%	72.2%
Monthly payment amounts	64.3%	76.1%	69.1%
Optional credit life insurance	24.6%	25.0%	24.8%
Other fees, such as late payment fees	24.6%	28.4%	26.2%
Total number of terms considered			
Mean	5.39	5.59	5.94
Median	7	6	6
Overall extent of search			
Almost no	23.4%	14.8%	19.9%
A little	19.5%	21.6%	20.4%
Moderate	29.7%	35.2%	31.9%
A lot	14.1%	15.9%	14.8%
Great deal	13.3%	12.5%	13.0%
Total	131	88	219

Note. Chi-square statistics are significant at: ** p-value < 0.01, *** p-value < 0.001.

5.2. Interdependency of information search—what else do consumers search for?

5.2.1. Information sources used

Using a log-linear model, we examined whether obtaining information from one particular source was associated with obtaining information from another source; results are presented

Table 3
Interdependency among use of information sources: maximum likelihood analysis—log-linear model

Source	DF	Chi-square	Prob
Refinancing	1	2.15	0.1428
Bank (Bank, S&L, Credit Union)	1	9.46	0.0021
Refinancing * Bank	1	1.14	0.2857
Mortgage companies	1	3.04	0.0812
Refinancing * Mortgage companies	1	3.67	0.0555
Bank * Mortgage companies	1	5.12	0.0236
Other Financial Institution (OFI)	1	4.64	0.0312
Refinancing * OFI	1	0.34	0.5627
Bank * OFI	1	0.90	0.3416
Mortgage companies * OFI	1	0.03	0.8624
Real estate agent	1	3.84	0.0501
Refinancing * Real estate agent	1	1.71	0.1915
Bank * Real estate agent	1	1.77	0.1828
Mortgage companies * Real estate agent	1	5.27	0.0217
OFI * Real estate agent	1	0.30	0.5830
Advertisement	1	6.13	0.0133
Refinancing * Advertisement	1	1.61	0.2042
Bank * Advertisement	1	5.72	0.0168
Mortgage companies * Advertisement	1	3.23	0.0721
OFI * Advertisement	1	0.59	0.4407
Real estate agent * Advertisement	1	3.45	0.0633
Ratings	1	0.03	0.8561
Refinancing * Ratings	1	0.11	0.7392
Bank * Ratings	1	1.22	0.2701
Mortgage companies * Ratings	1	4.10	0.0430
OFI * Ratings	1	0.12	0.7333
Real estate agent * Ratings	1	7.24	0.0071
Advertisement * Ratings	1	0.24	0.6238
Family	1	0.06	0.8007
Refinancing * Family	1	0.00	0.9938
Bank * Family	1	0.54	0.4634
Mortgage companies * Family	1	0.40	0.5286
OFI * Family	1	0.05	0.8181
Real estate agent * Family	1	2.18	0.1400
Advertisement * Family	1	2.54	0.1112
Ratings * Family	1	1.22	0.2698
Banks * Mortgage companies * Real estate agent	1	5.48	0.0192
Banks * Real estate agent * Advertisement	1	4.32	0.0378
Banks * Real estate agent * Ratings	1	7.23	0.0072
Mortgage companies * Real estate agent * Ratings	1	2.15	0.1422
Banks * Mortgage companies * Family	1	6.38	0.0115
Mortgage companies * Real estate agent * Family	1	0.41	0.5228
Likelihood ratio	27	22.49	0.7123

in Table 3. One out of seven (14.7%) refinancers and one-fourth (25.5%) of other mortgage borrowers reported that they did not use any information sources when obtaining a mortgage. On the other hand, less than two percentage of all mortgage borrowers used all the sources of information that were prompted.

The results of the log-linear model suggest 3-way interactions among: 1) banks/S&Ls/

credit unions (hereafter referred to as banks), mortgage companies, and real estate agent; 2) banks, real estate agents, and advertisement; 3) banks, real estate agents, and comparative ratings; 4) banks, mortgage companies, and family. There was also a significant two-way interaction between using information from mortgage companies and comparative ratings.[1]

If consumers did *not* obtain information from real estate agents, but did obtain information from mortgage companies, they were also likely to obtain information from banks. On the other hand, if consumers obtained information from real estate agents, but did *not* obtain information from mortgage companies, they were more likely to obtain information from banks.

With respect to the three-way interaction among banks, advertisements, and real estate agents, if consumers used information from advertisements, but not from real estate agents, they were more likely to get information from banks. On the other hand, consumers who did not get information from advertisements tended to use information from real estate agents regardless of whether or not they obtained information from banks.

For the interaction among banks, real estate agents, and comparative ratings, we find that those who obtained information from comparative ratings were more likely to get information from real estate agents, regardless of whether they obtained information from banks. For those who used third party ratings information, the use of real estate agent-provided information influenced their use of bank-provided information: if consumers did not get information from real estate agents, they were more likely to get information from banks.

With respect to the three-way interaction of banks, mortgage companies, and family, when information is not obtained from family or friends, a positive relationship between consulting banks and mortgage companies exists: if consumers obtained information from mortgage companies, they were also more likely to obtain information from banks. On the other hand, when information was provided by family or friends, the relationship between obtaining information from mortgage companies and banks became negative: those who did not get information from mortgage companies were more likely to get information from banks.

The two-way interaction between obtaining information from mortgage companies and comparative ratings shows that consumers who obtained information from comparative ratings were also likely to get information from mortgage companies.

5.2.3. Loan terms compared

Using a second log-linear model, we examined whether comparing a given loan term was associated with comparing other loan terms or conditions; results are presented in Table 4. One out of seven refinancers (15%) reported they did not compare any terms and one-fourth (26%) of other mortgage borrowers reported not comparing any terms. On the other hand, 14% of all borrowers (refinancers and other mortgage borrowers) reported they compared all the terms that were prompted, and another 17% of all borrowers examined all the terms except credit life insurance and other fees.

No complex 3-way interactions were found. Significant positive two-way interactions were found for 1) mortgage broker fees and application fees; 2) APR and monthly payment; and 3) credit life insurance and other fees. The two-way interaction of mortgage broker fees and application fees suggest a significant positive relationship between comparing mortgage broker fees and application fees: those who compared application fees tended to compare

Table 4
Interdependency among terms compared: maximum likelihood analysis—log-linear model

Source	DF	Chi-Square	Prob
Refinancing	1	7.87	0.0050
Interest rate	1	0.47	0.4919
Refinancing * Interest rate	1	1.13	0.2884
Fixed or variable rate	1	0.10	0.7558
Refinancing * Fixed or variable rate	1	0.11	0.7456
Interest rate * Fixed or variable rate	1	1.29	0.2555
Points or origination fees	1	0.00	0.9940
Refinancing * Points	1	0.05	0.8266
Fixed or variable rate * Points	1	0.43	0.5129
Mortgage broker fees	1	1.55	0.2139
Refinancing * Mortgage broker fees	1	0.03	0.8519
Fixed or variable rate * Mortgage broker fees	1	1.45	0.2290
Points * Mortgage broker fees	1	2.79	0.0948
Application fees	1	1.29	0.2553
Refinancing * Application fees	1	2.88	0.0899
Fixed or variable rate * Application fees	1	0.78	0.3771
Points * Application fees	1	0.03	0.8532
Mortgage broker fees * Application fees	1	7.94	0.0048
APR	1	1.49	0.2225
Refinancing * APR	1	0.13	0.7157
Fixed or variable rate * APR	1	0.79	0.3728
Points * APR	1	0.00	0.9742
Mortgage broker fees * APR	1	0.00	0.9484
Application fees * APR	1	0.87	0.3497
Monthly payment	1	1.95	0.1623
Refinancing * Monthly payment	1	0.01	0.9228
Fixed or variable rate * Monthly payment	1	1.58	0.2085
Points * Monthly payment	1	0.40	0.5250
Mortgage broker fees * Monthly payment	1	0.14	0.7083
Application fees * Monthly payment	1	0.09	0.7697
APR * Monthly payment	1	4.17	0.0412
Credit life insurance	1	0.19	0.6650
Refinancing * Credit life insurance	1	0.09	0.7631
Points * Credit life insurance	1	0.11	0.7370
Mortgage broker fees * Credit life insurance	1	0.03	0.8704
Application fees * Credit life insurance	1	0.02	0.9020
APR * Credit life insurance	1	0.09	0.7602
Monthly payment * Credit life insurance	1	0.65	0.4219
Other fees	1	0.03	0.8653
Refinancing * Other fees	1	0.00	0.9859
Points * Other fees	1	0.67	0.4148
Mortgage broker fees * Other fees	1	1.06	0.3031
Application fees * Other fees	1	0.02	0.8821
APR * Other fees	1	0.22	0.6384
Monthly payment * Other fees	1	0.84	0.3601
Credit life insurance * Other fees	1	24.67	0.0000
Likelihood ratio	17	9.23	0.9143

Table 5
Interdependency among information search measures: number of lenders contacted, number of sources consulted, and number of terms compared; correlation coefficients (p-value)

	Number of lenders considered	Number of sources consulted	Number of terms compared	Extent of search
Number of lenders contacted	1.0000 (0.0000)	0.5438 (0.0001)	0.4377 (0.0055)	0.5891 (0.0001)
Number of sources consulted		1.0000 (0.0000)	0.6268 (0.0001)	0.4674 (0.0001)
Number of terms compared			1.0000 (0.0000)	0.4552 (0.0001)
Extent of search				1.0000 (0.0001)

mortgage broker fees, and vice versa. Similarly, those who compared APR were more likely to compare monthly payment, and those who compared other fees were also likely to compare credit life insurance.

5.2.4. Interdependency among composite measures

Table 5 presents correlation coefficients among number of lenders contacted, number of sources consulted, number of terms compared, and perceived extent of search. Although all of the search measures were significantly and positively correlated, the magnitudes of correlation coefficients generally are not great. For example, the correlation coefficient between number of terms compared and number of lenders considered is 0.44, suggesting that these are two different dimensions of search. Similarly, the correlation coefficients among number of lenders considered, number of information sources consulted, and number of terms compared all suggest significant relationships, but each seems to include unique characteristics that were not captured by the other measures. The correlation coefficients between the perceived extent of search and these other measures are around 0.45–0.59, indicating the limitation of employing a single measure and the importance of measuring different dimensions of search behavior.

6. Discussion, conclusions, and implications

This paper has demonstrated that consumers use a variety of sources of information, they search for a variety of terms, and on average, they seek out a moderate amount of information. Furthermore, there are significant interdependencies in the features compared in the search process. For mortgage loans in particular, consumers used information from banks and mortgage companies as substitutes when they did not obtain information from real estate agents but used banks and mortgage companies as information-complements when they also obtained information from real estate agents. In the same vein, consumers used information from banks and mortgage companies as complements when they did not obtain information from family and friends but used banks and mortgage companies as information-substitutes when they also obtained information from family and friends.

The interaction among the features that consumers compared is of potential interest to policy makers. When deciding what terms and conditions to include in mandatory disclosures, it may be useful to know, for example, that consumers who compare interest rates or APRs are likely to also compare monthly payments. Thus, it may be better to require disclosure of a feature consumers are not going to actively seek out on their own rather than one that, although important, they will "always" look for.

The current Truth in Lending Act disclosures provide information on the APR, the finance charge (which includes a wide variety of fees and charges), the amount financed, the total of payments, a payment schedule (the number and amount of the payments and when these are due), "opt-in" provisions for credit insurance, whether there is a security interest, filing fees, late charges, and prepayment penalties. In addition, the Real Estate Settlement Procedures Act requires a preliminary good faith estimate of settlement costs including an itemized list of a wide range of fees. In all, there are dozens of features and costs disclosed per loan, far in excess of the combination of terms, lenders, and information sources consumers report using when shopping. However, while the results of this study suggest that consumers do not always use all of this information in comparison shopping, it is clear that different consumers shop for different sets of features; thus information on a range of features needs to continue to be available.

In July, 1998, the Federal Reserve Board and the Department of Housing and Urban Development issued a joint report to Congress, recommending changes to the disclosures provided to consumers during the mortgage application process (Federal Reserve Board, 1998). These recommendations included various ways of streamlining and simplifying mortgage loan disclosures, thus providing consumers with more meaningful cost information.

In addition to simplifying disclosures, the joint report also addressed the issue of timing of information and disclosures. The regulators recognized the tension between providing information early in the search process and providing firm, accurate information about the terms, conditions, and closing costs of the specific loan the consumer is considering. The HUD recommendation with respect to timing was for disclosures to "be provided before the consumer pays any significant fees" (Federal Reserve Board, 1998, p. 42). The Board's recommendation was that "initial cost disclosures (including *reliable* closing costs and an *estimated* APR and interest rate) be provided no later than three days after application" (Federal Reserve Board, 1998, p. 43, italics are in the original document).

Both regulators indicated that statutory changes would be needed in order to implement these recommendations. Congress did not act on this report at the time, but the issue continues to be on their agenda.

6.1. Limitations of this study and future research

One of today's more important sources of information, the Internet, was not included in this study. The Internet provides both a source of information as well as a set of sellers for comparisons. Numerous sites provide general consumer education about the home buying and mortgage shopping processes. However, recent studies on consumers' use of the Internet show mixed results. About one third (37%) of consumers reported using the Internet as an information source when shopping for a home (Littlefield et al., 2000). In 1998, "the Internet was not yet a factor in the thinking of many borrowers or lenders" (Duncan, 1999, p. 42). And while industry reports that on-line traffic of new customers has increased 150% between 1999 and 2000, consumers seem loath to buy insurance or apply for loans on line (Business Wire, 2000). Consumers seem to be using the Internet for mortgage shopping, but not for initiating the mortgage transaction (Myer, 2000). In a survey by FannieMae, 56% of consumers indicated they used the Internet to search for a mortgage, but only 21% used the Internet to price a loan and even fewer—4%—applied for a mortgage on line (Raines, 2000). Future studies on information search activities may need to separate the general information search from the price shopping aspects of the Internet.

Notes

1. Figures on these interaction effects are available from the authors.

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