

# ***Efficiency in the Mortgage Lending Market: Narrowing of Spreads Between Mortgage Rates Offered by Lenders on the Internet***

Published in the 2002 *Proceedings of the Academy of Economics and Finance*

***J. Edward Graham and Nikola Milivojevic, UNC Wilmington***

## **Abstract**

The semi-strong form of the Efficient Markets Hypothesis holds that prices reflect publicly available and relevant information; we hold that a similar pricing paradigm should exist in the mortgage lending markets, and that improved information flows over the past two decades have contributed to greater efficiency in the market for secured real estate loans. We believe this greater efficiency will manifest itself empirically with more rapid loan approvals and increased homogeneity of loan offerings by lenders. Specifically, we hold that information flows have increased with the Internet and that these greater flows have resulted in lower interest rates and narrower differences in the costs of lending between different lenders. Greater competition and transparency of lending rates for the better-informed borrower leads to the commoditization of mortgage loans, particularly with the exponential growth of the secondary mortgage markets. We believe this commoditization is in part attributable to the growth of the Internet. We propose a series of tests that should reveal both the growing efficiency of the mortgage lending market and the portion of that growth that can be attributed to the increasing and accessible information flows on the Internet.

## **Introduction**

This paper considers the premise that the spread between mortgage rates offered by various lenders has narrowed over the last twenty years, correlated to some degree with increasing mortgage offerings on the Internet. With the much greater information flows to borrowers as a result of Internet mortgage lending activities, our premise holds that competitive pressures have tightened spreads between various mortgage lenders. Whereas before the Internet, lenders could capitalize on less-informed borrowers and place mortgages at varying rates, leading to greater disparities in interest rates between sundry lenders, the Internet has heightened competition and reduced these disparities. This research will consider the degree to which the Internet is associated with greater homogeneity and similarity in offerings in the real estate lending market.

In the current business environment, it is commonly held that not being on the Internet represents a competitive disadvantage. Information flows, however, are greatly enhanced with the Internet and advantages arising from abbreviated flows are extinguished via the Internet. Increased information flows, for example, are provided for those in the mortgage industry and lead to greater efficiencies in the mortgage lending market and to greater competitive pressures. This research considers this dilemma for business - the costs and benefits of increased information flows - and the efficiency in the mortgage lending market, as illustrated by the width of the spreads between the offerings of various mortgage lenders.

## **Background**

No widely-circulating study specifically considers *and measures* the impact of the Internet on increasing competitive pressures in the mortgage lending market. We seek to extend the existing research in this study with a preliminary measure of this impact. A number of authors, though, consider the *general* impact of the Internet on mortgage lending.

Bennet, Peach and Peristiani (1998) allude to the increasing efficiencies of the mortgage lending market, in large part attributable to such technological factors as the increasing presence of the Internet. Danlord (1999) notes that “consumers have long recognized the inadequacies and inefficiencies of the mortgage” markets, and suggests that the Internet’s presence should “drastically” lower mortgage rates to borrowers, as it first enables lenders to offer lending services at much lower costs. He does not, however, propose a measure of the link between lending costs and increasing mortgage lending activity on the Internet.

Increasing technology uses in mortgage lending impacts mortgage investors; these impacts, for the mortgage portfolio manager, are considered by Heike and Mattu (2000). Hornburg (2001) allows that increasing uses of technology in lending leads to greater complexities in the mortgage markets. But, with mortgages having been “turned into commodities,” lending is becoming much more competitive and such foundations of the economy as home ownership are encouraged.

Thomas (1999) notes that a number of issues confront both lenders and borrowers on the Internet; these include the automated credit evaluations considered by Straka (2000). Modor (2000) reviews the new protocols and procedures being developed with increasing on-line offerings. Concerns by both lenders and prospective borrowers, for the accuracy of the information shared and the legitimacy of the transactions proposed, are underscored. Policies are evolving to address these concerns.

Information retrievals on the Internet are becoming much more straightforward. Among others, Clayton (1998) suggests that if a customer wants to find the best mortgage deal, all he needs do is log on to the Internet and search some of the sites such as *QuickenMortgage*, *HomeShark*, and *Keystroke*. With the ability of an Internet browser to compare information, customers are given the opportunity to make a “first pass” of loan offerings from the privacy of the home. Fields (2000), in his recent work, supports Clayton; he adds that lenders are having a hard time keeping their customers, because of better and cheaper deals out on the ‘net. The standard way of doing business when it comes to mortgage lending is becoming a thing of the past.

Companies such as E-Loan are modifying conventional features of mortgage lending and are trying to cut the broker out of the picture. According to one of the co-founders of the company, Jania Pawlowski, cited in Carlassare’s (2001) publication, “this eliminates the inefficiencies caused by scads of intermediaries in the traditional cumbersome lending process.” Bates (1995) and Cooley (1995) agree with this idea; they hold that technology is a driving force in the reformation of business and that the Internet is forcing the mortgage industry to rethink its marketing strategies. Implied in all of these studies is the force the Internet is playing in driving down the cost, *ceteris paribus*, of mortgage borrowing.

Since the playing field is leveled with the emergence of the Internet, lenders are forced to play according to new rules. Given the advantage that customers have in being able to choose among the many offerings on the ‘net, lenders must respond to a market-determined price, versus patterns earlier in the 20<sup>th</sup> century of dominance of local markets by a single or few lenders. Individual mortgage lenders possess far less market power than in the past, as the market becomes more competitive and efficient. As earlier implied, Fields (2000) notices, “[one eighth] of a point or a waived appraisal fee and your ‘loyal customer’ was history.” Just like in any other competitive environment, the bigger the selection and more options a customer has, the greater his market power. Armstrong (2000) notes that the Internet is practically the most efficient resource for finding information about mortgage lending, and has caused many financial institutions to redefine their strategies.

Lenders face similar competitive pressures with the evolution of the Internet, and can ignore these pressures only at their peril. Portner (1999) holds that the customer is able to search the rates in the huge directory of lenders on the web, and then go back and demand the same deal from his or her local lender. The lender is often left with no choice but to match the offer or lose the business. Hewitt (1999) warns that a bidding price war between lenders for the lowest borrowing price has already started. Convenience, choice, and price are the most important factors that make E- lending efficient, according to Hewitt. Britt (1996) is just one of the many writers that anticipate these comments; he earlier anticipates the impact of the Internet on mortgage lending, and the subsequent commoditization of mortgages.

With the prediction that mortgage lending on the ‘net will climb to close to \$100 billion in 2003, according to Bergsman’s (2000) research, one could easily believe that the conventional way of mortgage lending may slowly disappear. Beidl’s (2000) work echoes Bergman’s suggestions. He outlines why financial institutions should embrace the new wave of technology and do more business

on the web. No matter what happens next in the lending market, technology has already changed this market forever. It seems that lenders will become less distinct; with the commoditization of mortgages, borrowers are better served in a more cost-effective and more efficient lending environment. It is likely that significant spreads between the mortgage rates offered by lenders have narrowed and will narrow further in the future. But, it is not immediately clear, and no widely circulating research considers, the degree to which the Internet has contributed to this “leveling of the playing field” that appears to have significantly benefited the mortgage borrower.

## Methodology

Our main premise is that the Internet encourages greater competition in mortgage lending, leading to reduced spreads between lenders with similar mortgage offerings. We will first test this premise in a very general sense; we will gather data on the use of the Internet (using proxies such as the total number of subscribers to Internet service providers) and measure the correlation between this use and the tightening of the spreads between varied lenders both on and off the Internet. In its nascent stages, and up until the mid-1990’s, many lenders did not have an Internet presence. We will begin measuring the tightness of this spread before many of the lenders began their Internet offerings. We will extend this measure to the current market where every lender, literally, has some Internet exposure.

The following model is used to measure the impact of the Internet on mortgage lending activity and costs of borrowing. Where:

$$?_{1t} = ?(N_t, L_t, C_t)$$

With,

$?_{1t}$  = Average adjusted spread between *all* mortgage lenders at time t.

$N_t$  = The total number of subscribers, based upon publicly available data, of the following large Internet Service Providers: AOL (and Compuserve before its merger), Bell South, and AT & T.

$L_t$  = The number of mortgage lenders participating in the Internet, as proxied by data available from the Federal Reserve.

$C_t$  = The average size of a mortgage loan at time t, based upon data provided by the Federal Reserve. (Note that exhaustive data on mortgage lending is provided by the “Fed,” and will likely be employed in this study as it evolves.)

In the first model, we simply consider the change in the spread ( $?_1$ ) between mortgage lenders as the use of the Internet grows. The average adjusted spread is a measure of the difference between a given lender’s effective cost of borrowing (imputing mortgage costs such as points and origination fees) and the average for *all* lenders, assuming the mortgage is fully amortized. For example, if the effective cost of borrowing for a lender is 7% and the average for all lenders is 6.8%, the adjusted spread is .2%;  $?_1$  will simply be the average difference at a given point in time over our study period, from January of 1981 to the present.

$?_{1?}$  = the standard deviation of the average adjusted spread between all mortgage lenders.

In a model tailored more precisely to gauge the homogeneity of offerings among Internet lenders, we have:

$?_{2t}$  = Average adjusted spread between *Internet* lenders, as a function of the independent variables  $N_t$ ,  $L_t$ , and  $C_t$ . Where, as before:

$N_t$  = Number of subscribers to on-line services at time t.

$L_t$  = Number of mortgage lenders on the Internet at time t.

$C_t$  = Average loan size at time t.

We expect the following relationships between  $\beta_1$  and the independent variables: the signs of  $N_t$  and  $L_t$  should be negative and significant, as with the expanded use of the Internet, costs and spreads for the borrower should go down. Similarly, as the average size of a mortgage in dollars ( $C_t$ ) increases, the spread ( $\beta_1$ ) should decrease. A negative sign is forecasted for  $C_t$ .

Likewise, we expect  $\beta_2$  to diminish over time, and we will generate measures of  $\beta_2$  for the first and last five years of our study period. We expect the standard deviation of the latter period to be significantly smaller than that of the earlier period. We believe that not only has the absolute size of differences in the prices of mortgage loans diminished over time, but that the variability of the differences has fallen with increased efficiencies in the mortgage lending markets. Our theory is unambiguous, as well, concerning the relation between  $\beta_1$  and  $\beta_2$ . The average adjusted spread between Internet lenders should be small, and  $\beta_1$  will be greater than  $\beta_2$ . We suggest that  $(\beta_1 - \beta_2) > 0$ , at a high level of significance.

We expect that information flows have increased with the Internet's growth and that these greater flows have manifested themselves in lower interest rates and tighter spreads. To test this premise, we will gather historical data from selected lenders, and measure the spread between the rates offered by lenders over the last twenty years. We will develop a measure of this spread for each month of our study, data permitting, since January of 1981. We will contact various lenders, using published and proprietary information where accessible, to build our database.

### **Concluding Remarks**

Once we have developed a measure of the spreads between mortgage lenders, and have contrasted this with Internet use as the dependent variable, we will seek to control for other factors that may be associated over the past twenty years with greater competition in the lending market. These factors will include general economic conditions and the raw number of lenders no longer restricting themselves geographically, as mortgage capital "migrates" to a much larger degree today than in the past. We will allow also for the evolution of the financial markets after the collapse of the thrift industry in the late 1980's.

Finally, towards getting some feel for the underlying cause of these tightening spreads, we will extend our research. We fully expect to observe an association between increasing Internet-usage and declining spreads between lenders, but we require a measure of the strength of this association and the degree to which the Internet might have *caused* this declination. Measures such as Granger causality, Seemingly Unrelated Regressions and Generalized Methods of Moments offer themselves as likely tools in this endeavor.

We are hopeful that the story we wish to tell will supplement, with concrete measures of the size and significance of the Internet's contribution, earlier works recognizing the importance of new technologies in rendering the mortgage market more efficient.

### **Acknowledgements**

The authors are grateful to UNC Wilmington and an Undergraduate Research Fellowship Award, and to participants at the 2002 sessions of the Academy of Economics and Finance, for supporting and encouraging this research.

### **References**

- Armstrong, Larry. 2000. "Click Your Way to a Mortgage." *Business Week* Issue 3671: 174-176.
- Bates, Mark F. 1995. "Real Estate Begins to Go Online." *Real Estate Issues* 20: 1, 48.
- Beidl, Richard A. 2000. "Housing Finance on the Internet: The Battle for Global Dominance." *Housing Finance International* 14: 3, 7-13.

- Bennett, Paul, Dick Peach, and Stavros Peristiani. 1998. "Structural Change in the Mortgage Market and the Propensity to Refinance." Working Paper. Federal Reserve Bank of New York.
- Bergsman, Steve. 2000. "Mortgage Mania." *Chief Executive* 151: 45-46.
- Britt, Phil. 1996. "A Look at Internet Lending." *America's Community Banker* 5: 6, 46.
- Carlassare, Elizabeth. 2001. "Carving out a Spot with the Big Boys." *Upside* 13: 2, 185-189.
- Clayton, Michelle. 1998. "Examining Electronic Mortgage Networks." *America's Community Banker* 7: 7, 14-20.
- Cooley, Scott. 1995. "Selling Loans in Cyberspace." *Mortgage Banking* 56: 3, 32.
- Danlord, David. 1999. "Online Mortgage Business Puts Consumers in the Driver's Seat." *Secondary Mortgage Markets* 16: 1, 2-8.
- Fields, Ruth G. 2000. "Changing Gears." *Mortgage Banking* 60: 5, 14-18.
- Heike, David and Ravi Mattu. 2000. "Risk and Return in the Mortgage Market: Review and Outlook." *Journal of Fixed Income* 10: 5-23.
- Hewitt, Janet Reiley. 1999. "The Internet Price War." *Mortgage Banking* 59: 6, 17,108.
- Hornburg, Steven. 2001. "Will Technology Expand Housing Opportunity?" *Mortgage Banking* 61:11, 36-43.
- Modor, Paul. 2000. "Washington's Wrestling with E-Disclosures." *Mortgage Banking* 60: 6, 61-70.
- Portner, Fred E. 1999. "The Forced Evolution of Mortgage Production." *Mortgage Banking* 60: 1, 76-86.
- Straka. 2000. "A Shift in the Mortgage Landscape: The 1990's Move to Automated Credit Evaluations." *Journal of Housing Research* 11: 2, 207-232.
- Thomas, Craig C. 1999. "Policy Thicket Complicates Efforts to Take Lending Online." *Secondary Mortgage Markets* 16: 1, 9-15.