This PDF is a selection from a published volume from the National Bureau of Economic Research

Volume Title: Studies of Labor Market Intermediation

Volume Author/Editor: David H. Autor, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 978-0-226-03288-7; 0-226-03288-4

Volume URL: http://www.nber.org/books/auto07-1

Conference Date: May 17-18, 2007

Publication Date: November 2009

Chapter Title: Mortgage Broker Regulations That Matter: Analyzing Earnings, Employment, and Outcomes for Consumers

Chapter Author: Morris M. Kleiner, Richard M. Todd

Chapter URL: http://www.nber.org/chapters/c3589

Chapter pages in book: (183 - 231)

6

Mortgage Broker Regulations that Matter
Analyzing Earnings, Employment, and Outcomes for Consumers

Morris M. Kleiner and Richard M. Todd

6.1 Introduction

Mortgage brokers are intermediaries who both match potential mortgage borrowers and lenders and assist them in completing the loan origination process. Brokers have typically operated as independent service providers, not as agents or employees of either borrowers or lenders, and they are compensated by fees paid by the borrower and sometimes the lender as well.[1] Their role in the U.S. mortgage market has mushroomed from insignificant in 1980 to predominant in recent years. By 2004, about 53,000 mortgage broker firms were operating in the United States and were directly or indirectly involved in the origination of as many as 68 percent of all mortgages that

1. Some states have recently moved to enact or more strictly enforce laws that make the broker an agent of the borrower, but this was not a factor during our study period.

year (Wholesale Access 2005).[2] As the mortgage broker business grew, so did questions about the industry's role and its effects on consumer welfare.

From one perspective, the rise of mortgage brokering was just one part of a broader vertical disintegration of the lending business that is widely thought to have made mortgage credit more widely and cheaply available to many households (Jacobides 2005; Gerardi, Rosen, and Willen 2007). According to both the general theory of brokers (Yavas 1994) and mortgage market scholars (El Anshasy, Elliehausen, and Shimazaki 2005; U.S. Department of Housing and Urban Development 2002; Guttentag 2000), mortgage brokers have played a role in the evolution of the highly specialized and efficient mortgage market. In particular, brokers can make the complicated task of shopping and applying for the increasingly wide array of mortgage products more manageable and efficient for borrowers and lenders alike. Millions of households, including many affluent and sophisticated consumers, have arranged mortgages through brokers, frequently more than once. It seems likely that many, if not most, found value in the brokers' services, which is what we would expect in honest, competitive markets.

On the other hand, critics have argued that too many mortgage brokers are not honest or, more broadly, that market failures prevent competition from effectively disciplining brokers' profits and quality of service. According to these critics (Guttentag 2000; LaCour-Little and Chun 1999; Alexander et al. 2002; Kim-Sung and Hermanson 2003; Jackson and Burlingame 2007), market failures (chiefly in the form of information asymmetries) allow mortgage brokers to profit unduly at the expense of mortgage borrowers as well as lenders. These issues are said to be especially problematic in the subprime mortgage market, where mortgage brokers have dominated originations in recent years (Schloemer et al. 2006).

In response to these concerns, a range of policy measures have been discussed. One of the most common responses has been to increase the occupational licensing standards for mortgage brokers. Pahl (2007) documents how state licensing of mortgage brokers increased at both the extensive (more states) and intensive (more restrictions per state) margins between 1996 and 2006, and since then, a surge in mortgage foreclosures has provided political momentum for the enactment of further regulation. Policymakers seem to have concluded that a lack of market discipline and regulatory oversight has allowed many mortgage brokers to originate excessively expensive and risky mortgages (Gramlich 2007), and a more comprehensive system of mortgage broker licensing is often viewed as part of the solution (Kroszner 2007; Conference of State Bank Supervisors 2007; Shumer 2007).

2. By 2006, the number of firms had changed little but their share of originations was estimated to have declined to about 58 percent (Wholesale Access 2007). With the volume of subprime lending apparently falling significantly in 2007, mortgage broker numbers may be declining further, as brokers had originated the majority of subprime mortgages (Olson 2007).

Despite the growing attractiveness of mortgage broker licensing to policymakers, both theory and empirical evidence suggest that licensing will not necessarily improve outcomes for consumers (Kleiner 2006). Even theories that emphasize the role of occupational licensing in enhancing the quality of services provided find that licensing tends to also raise the average price of the occupation's services, possibly to the detriment of consumers who prefer low prices to high quality. Some theories that focus on other aspects of licensing, such as its potential to serve as a vehicle for current practitioners to collusively impede the entry of new firms, may imply lower quality as well as higher prices. Empirical assessments of the effects of occupational licensing have often confirmed its potential to raise prices, sometimes with little or no gain in quality. However, the results differ widely by occupation, and we are not aware of any comprehensive assessments of mortgage broker licensing.

In order to fill this gap, we examine the relationships between mortgage broker licensing and market outcomes. We provide some background on the occupation and review theories of how licensing can affect outcomes in both the labor market for mortgage brokers and the consumer product market for mortgages. We introduce and summarize Pahl's recent compilation of mortgage broker licensing requirements from the fifty states and the District of Columbia for the period 1996 to 2006. We then use Pahl's data to analyze whether mortgage broker licensing or any of its components have significant relationships with labor or product market outcomes. We attempt to construct overall indices of the tightness of mortgage broker licensing but find that they are not significantly related to market outcomes. We then examine many of the separate components of state mortgage broker regulation and find that one component—the requirement in many states that mortgage brokers maintain a surety bond or maintain a minimum net worth—has a significant and fairly robust statistical association with fewer brokers, fewer subprime mortgages, higher foreclosure rates on subprime mortgages, and a higher percentage of mortgages carrying high interest rates.[3]

6.2   The Rise of Mortgage Brokering and the Issues It Raised

The evolution of mortgage brokering in the United States and the policy issues that arose with it have been well described in other sources;[4] we summarize them here to motivate and provide background for our analysis of

3. Some of the other components of mortgage broker regulation also are significant in some of our specifications and may deserve further research (see appendix D), but here we focus on the bonding and net worth requirements because they were more broadly and consistently significant.

4. For example, see U.S. Department of Housing and Urban Development 2002; Essene and Apgar 2007; Apgar, Bendimerad, and Essene 2007; Engel and McCoy 2002; El Anshasy, Elliehausen, and Shimazaki 2005; LaCour-Little 2007c; Jackson and Burlingame 2007; Guttentag 2000; Woodward 2003.

mortgage broker licensing. In particular, we note that mortgage brokering has become an economically significant industry, surrounded by controversy about the extent of benefits it provides to consumers and lenders, and we describe some of the key pricing and quality issues that policymakers try to address with licensing programs.

The National Association of Mortgage Brokers (NAMB) delineates the roles of the mortgage lender and the mortgage broker as follows:[5]

> The wholesale lender underwrites and funds the home loan, may service the loan payments, and ensures the loan's compliance with underwriting guidelines. The broker, on the other hand, originates the loan. A detailed application process, financial and credit worthiness investigation, and extensive disclosure requirements must be completed in order for a wholesale lender to evaluate a consumer's home loan request. The broker simplifies this process for the borrower and the wholesale lender, by conducting this research, counseling consumers on their loan package choices, and enabling them to select the right loan for their home buying needs. The mortgage loan process can be arduous, costly, and seemingly impossible to the consumer. The broker works as the liaison between the borrower and the lender to create a cost effective and efficient loan process.
>
> As an independent contractor, the broker allows wholesaler lenders to cut origination costs by providing such services as preparing the borrower's loan package, loan application, funding process, and counseling the borrower.

The services of mortgage brokers were not in great demand thirty years ago. At that time, the mortgage industry was made up almost entirely of large, integrated firms (banks and savings and loans) that managed the entire process of bringing borrowers and investors together. They located investors (depositors, in this case) and borrowers, recommended the appropriate type of mortgage (typically from a small set of options), analyzed borrowers' creditworthiness and the value of their collateral, closed the loans, serviced the loans, and made payments to the investors.

By 2000, the mortgage market had changed radically (Jacobides 2005; U.S. Department of Housing and Urban Development 2002). Technological change (fax machines, the Internet, etc.), financial innovation (credit scoring, automated underwriting, securitization of mortgages, etc.), and deregulation (e.g., repeal of state usury limits) abetted extensive specialization and

---

5. The quotation, from the NAMB's FAQ web page: www.namb.org/namb/FAQs1 .asp?SnID=1916912282, was downloaded on November 8, 2007. The term "broker" is generally used to refer to a firm offering mortgage brokerage services, while the term "loan officer" is commonly used to refer to an employee of a mortgage broker who actually performs these services. We adopt this common usage. However, terminology in the industry is not uniform (HUD 2002) and can be confusing, not least because the actual roles of brokers, loan officers, lenders, and others are not rigidly bounded and often blur. For a wry but useful summary of the overlapping roles and confusing jargon in the mortgage origination business, see "Mortgage Origination for UberNerds," a September 7, 2007, posting on the Calculate Risk blog, at http://calculatedrisk.blogspot.com/2007/09/mortgage-origination-channels-for.html.

vertical disintegration in the industry, so that separate firms could focus on particular steps in the process, such as loan marketing and closing (the brokers' origination specialties), underwriting, initial funding, servicing, pooling (for sale in the secondary market), and long-term funding. At the same time, the range of potential participants within each niche broadened; for example, nondepository mortgage banks competed with depository institutions to originate and sometimes service, pool, or fund mortgages. In addition, new types of mortgages (e.g., adjustable rate mortgages, or ARMs) and differentiated products aimed at a wider array of consumers (e.g., a variety of subprime mortgages with risk-based interest rates for high-risk borrowers) took significant market shares.

These developments both affected and were affected by the rapid growth of mortgage brokering. As the decision to grant credit became less based on subjective assessments of the loan applicant and more based on credit scores and other objective underwriting standards, underwriting moved to the back office, and loan officers employed by depository institutions focused increasingly on sales and loan closing services. Improved communications technology—fax machines and, later, the Internet—fostered the physical separation of the sales function from the underwriting function, and this, in turn, made it possible to outsource either or both. Mortgage brokers take outsourcing one step further, in that they work for themselves, as independent contractors dealing with multiple lenders. As such, brokers allowed both established mortgage lenders (the depository institutions) and new competitors (nondepository mortgage banks) to specialize and to rapidly scale up or down their sales efforts and loan origination volumes in response to market cycles and competitive opportunities (Apgar, Bendimerad, and Essene 2007; U.S. Department of Housing and Urban Development 2002).

Low overheads and the resulting ability to efficiently market within residential neighborhoods also helped brokers penetrate the emerging subprime market, which included many households who were somewhat unfamiliar with traditional mortgage lending institutions. The number of mortgage brokers and the number of subprime mortgage originations grew in tandem (figure 6.1), and mortgage brokers came to dominate the origination of subprime mortgages (Schloemer et al. 2006). Much of the growth of the mortgage broker industry took place on the extensive margin, by the addition of new firms, as the average size of firms remained small (about ten individuals) during most of our study period (Sichelman 2003).

On the consumer side of the market, the much wider array of lenders and mortgage contracts to choose from made mortgage shopping much more challenging (Guttentag 2000). Mortgage brokers, by consolidating information on multiple products from multiple lenders, offered consumers a convenient way to examine a variety of home loans for which they were financially qualified. The result was the creation of a viable intermediary role and rapid growth in the mortgage broker industry.
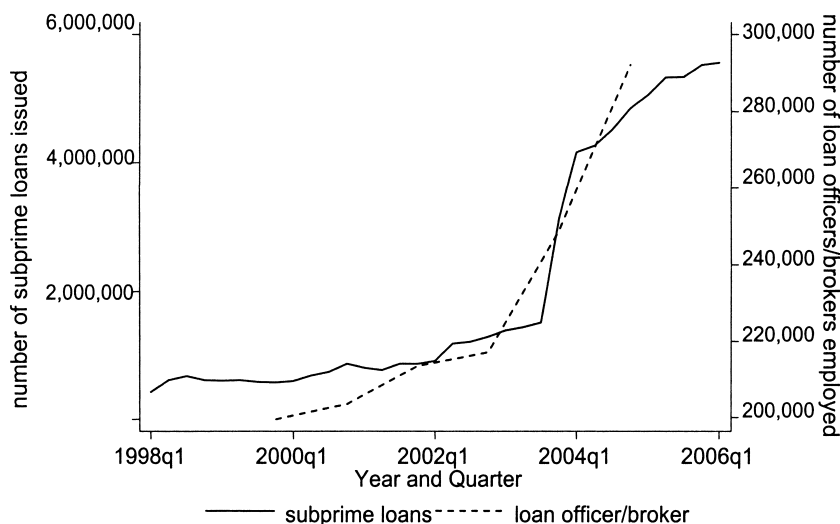
Fig. 6.1   Growth of subprime loans and loan officers/brokers

Sources: The Occupation Employment Survey and the National Delinquency Survey of the Mortgage Bankers Association of America (2007).

The transformation of the U.S. mortgage market after 1980 created significant benefits for U.S. consumers by increasing homeownership and improving the efficiency of mortgage processing (Gerardi, Rosen, and Willen 2007; U.S. Department of Housing and Urban Development 2002), and mortgage brokers can claim a share of the credit. They serve millions of customers from all parts of society, and their repeat business and the multiyear growth in their market share through 2006 suggest that many of their customers have been pleased with their services. Brokers have helped to shorten the loan closing process and to make it cheaper, and they have enabled the mortgage industry to meet enormous fluctuations in demand. However, the transformation of the mortgage industry created some new problems, and mortgage brokers are also blamed for some of these.

Critics of mortgage brokers generally focus on incentive problems stemming from the fact that the broker is an intermediary whose pay depends directly on the size and number of loans originated and only indirectly on whether the borrower got a good deal and also makes payments as expected (Schloemer et al. 2006). The incentive issues arise because of information asymmetries between the borrower, lender, and broker. Studies have repeatedly shown, for example, that borrowers are very confused by the language and terms of mortgage contracts and related documentation (Pappalardo and Lacko 2007; Woodward 2003; Guttentag 2000). Borrowers frequently fail to understand basic facts about the mortgages they have signed and are even more confused about the other mortgage options available to them.

Many are willing to follow the advice of a professional, such as a mortgage broker, even though they may be unable to verify the quality of the advice even after the fact (Pappalardo and Lacko 2007; Kim-Sung and Hermanson 2003). This creates an opportunity for professionals, including mortgage brokers,[6] to abuse that trust by, for example, recommending a mortgage that has a higher interest rate than the customer actually qualifies for, in order to obtain a higher fee. The following are among the most frequently cited consumer issues regarding mortgage brokers (and others with the same incentives):

1. Brokers steer borrowers "to mortgages that provide higher compensation to the broker but are not necessarily the lowest cost or most advantageous to the consumer" (El Anshasy, Elliehausen, and Shimazaki 2005, 4; also Apgar, Bendimerad, and Essene 2007; Essene and Apgar 2007; Schloemer et al. 2006), and they do so deliberately and disproportionately with subprime, minority, elderly, or poorly informed customers (Kim-Sung and Hermanson 2003; Jackson and Burlingame 2007; Ernst, Bocian, and Li 2008; Woodward 2008).

2. They market aggressively to maximize origination fees, in particular by persuading borrowers to take loans they cannot afford or to refinance too frequently (Kim-Sung and Hermanson 2003; El Anshasy, Elliehausen, and Shimazaki 2005).

3. They receive fees from borrowers and lenders that are more than commensurate with services rendered (Apgar, Bendimerad, and Essene 2007; Essene and Apgar 2007; Schloemer et al. 2006), especially from minority (Jackson and Burlingame 2007) or unsophisticated (Guttentag 2000) borrowers.

Asymmetric information also makes lenders concerned about the quality of mortgage brokers' services. Brokers' fees are usually paid only if and when loans are closed. Thus, brokers' immediate incentives are to earn their fees by getting lenders to approve and close loans, and they do not have a direct stake in subsequent loan performance. These incentives have been seen as raising the following major issues for lenders regarding brokers:

1. Brokers may corrupt the information about the borrower that is submitted for underwriting in order to increase the chances that the lender will approve the loan (Apgar, Bendimerad, and Essene 2007; El Anshasy, Elliehausen, and Shimazaki 2005), with the result that loans handled by brokers are more likely to default than loans processed by the lender's own loan officers (Alexander et al. 2002). The incomplete or inaccurate information

---

6. This potential is not limited to mortgage brokers, however. It extends to loan officers at mortgage lending banks when they are paid incentives based on the size and interest rate of the loans they originate.

can arise from either carelessness or deliberate misrepresentation or fraud (Schloemer et al. 2006).

2. Contrary to contractual agreements with their lender clients, they encourage the client's existing borrowers to refinance, so that prepayment rates on the lender's broker-originated mortgages are higher than on mortgages originated by the lender's own loan officers (LaCour-Little and Chun 1999).

In principle, private actions within the marketplace can mitigate these consumer and lender information and incentive problems and correct or alleviate the market failures that have been alleged. For example, over time, lenders can monitor the quality of the loans submitted by a given broker and either stop dealing with or pay lower fees to inferior brokers. Although some lenders began monitoring in this way, industry experts assert that, at least until recently, these efforts have not been sufficiently strict or widespread to significantly change aggregate outcomes (Alexander et al. 2002; Apgar, Bendimerad, and Essene 2007). Some lenders mitigated losses by pricing broker-originated loans differently, using higher interest rates on these loans to offset default risk or imposing prepayment penalties to offset higher prepayment risk (Alexander et al. 2002), but prepayment penalties became controversial in their own right. On the consumer side, confusion about mortgages contributed to enhanced efforts at homebuyer financial education, but with only limited results. Guttentag (2000) suggested a new contractual arrangement, the Upfront Mortgage Broker, under which mortgage brokers would serve as the borrower's agent in return for fixed, fully disclosed fees. So far only a small fraction of brokers work under this arrangement. In short, as of 2007 it appears that market responses have not eliminated concerns about bad outcomes caused by asymmetric information and incentive conflicts in the mortgage broker market. Partly as a result, many mortgage lenders have cut back on or ceased accepting broker-originated loans, exacerbating the steep decline in mortgage brokering since 2006.

6.3   Theory and Previous Studies of Licensing

With private responses not eliminating concerns about mortgage broker incentives and actions, public policymakers have entered the fray. The federal financial regulatory agencies have promulgated new guidelines and requirements regarding mortgage information disclosures and subprime loan underwriting and pricing. Many states and local governments have enacted so-called antipredatory lending laws that restrict mortgage interest rates, fees, and contract terms. In addition, state legislators and regulators, often with the support and help of mortgage broker trade associations, have broadened and tightened the requirements for mortgage broker firms and individual loan officers to obtain the licenses that they need to

operate legally. Then, in the Housing and Economic Recovery Act of 2008, Congress established new minimum requirements for state mortgage broker registration and regulation. In this section, we review theories and previous empirical studies of occupational licensing. In the following sections we summarize the specifics of mortgage broker licensing in the United States and assess how state differences in mortgage broker licensing are associated with outcomes in the labor and mortgage markets.

6.3.1   Theories of Occupational Licensing

The simplest theory of occupational licensing draws more on a mechanical concept of administrative procedure than on economics. It envisions an essentially costless supply of unbiased, capable gatekeepers and enforcers. The gatekeepers screen entrants to the profession, barring those whose skills or character suggests a tendency toward low-quality output. The enforcers monitor incumbents and discipline those whose performance is below standards, with punishments that may include revocation of the license needed to practice. Assuming that entry and ongoing performance are controlled in these ways, the quality of service in the profession will almost automatically be maintained at or above standards.

We can add some economics to this otherwise mechanical model by noting that a key discipline on incumbents—the threat of loss of license—may not mean much if incumbents can easily reenter the profession, such as by moving to a new firm or state, or shift to an alternative occupation with little loss of income. For example, if sales skills are the key to both mortgage brokering and selling cars, then individuals may shift between these lines of work with little loss of income.[7] Under these circumstances, meaningful discipline may require deliberate steps to ensure that loss of license entails significant financial loss. Such additional steps could include imposition of fines, improved screening to prevent expelled practitioners from reentering the occupation, or requiring all incumbents to put up capital that would be forfeited upon loss of license.[8] To offset the possibility that incumbents could shift to other occupations with little loss of income, entry requirements could be tightened to limit supply and create monopoly rents within the licensed occupation. The threat of losing these monopoly rents could,

7. An experienced mortgage broker, quoted in McGarity (2001, 41), complains about "brokers who pop in and out of the market," claiming that they are often the ones who abuse borrowers and noting, "People think they can make a quick buck, but they're not in it for the long haul. We'll see every shoe salesman and photocopier salesman will all of a sudden be a mortgage broker, but come next year they'll all be gone."

8. Steps along these lines have been or are being taken by mortgage broker licensing authorities. Financial regulators from about forty states are currently cooperating on a new software application that will make it easier to track individual mortgage brokers and loan officers as they seek to change the firms or states in which they work (Conference of State Bank Supervisors 2007). Many states already require mortgage brokers to maintain a physical presence in each state in which they operate or to maintain a commercial surety bond. Potential loss of professional esteem may also be a deterrent (Kandel and Lazear 1992).

in principle, give incentives to incumbents to maintain standards. The rents also could motivate potential entrants to invest in high levels of training in order to gain admittance. This suggests that licensing can raise quality within an industry by restricting supply and raising prices.

Friedman (1962) questioned the assumption of unbiased gatekeepers and enforcers and viewed licensing's entry restrictions and monopoly rents as purely negative. He argued that licensing systems are almost always run by and for incumbents, so that gatekeepers and enforcers are, in reality, self-interested. Their vested interests lead them to not only create monopoly rents through restrictions on entry but also stifle complaints and disciplinary procedures against most incumbents. Weak discipline on incumbents, along with artificially high client-provider ratios, lead to a decrease in the overall quality of service that consumers receive. In other words, Friedman predicts that licensing reduces the size of an occupation and leads to a combination of higher fees for providers and lower quality for consumers. Friedman also stresses that the proper measure of quality is the overall quality of services received by consumers, not the average quality of services provided by licensed providers, because licensing, by raising prices within the licensed occupation, may cause consumers to seek substitute services from nonlicensed occupations that provide lower-quality output. Friedman's analysis led him to conclude that licensing had no useful role, except possibly in very limited circumstances involving externalities.[9]

In the 1980s, Akerlof's (1970) analysis of how information asymmetries about the quality of goods could lead to adverse selection and the predominance of low-quality goods in unregulated markets spurred the development of new theories of occupational licensing. The new models ignore Friedman's concerns about self interest and also largely disregard the disciplining of incumbents in order to focus on more realistic modeling of the capabilities of gatekeepers.[10] In particular, they assume that neither regulators nor consumers can directly observe the quality of producers ex ante. These models then explore how the theory of licensing changes when entry barriers depend only on information that might realistically be observed. The new models include not only unobserved heterogeneity in quality among producers but also heterogeneous tastes for quality among consumers. The new models yield a mixed perspective on the effects of licensing: licensing can increase the average quality of service within the occupation, but this

---

9. It is arguable that mortgage markets are subject to material externalities, to the extent that foreclosures impose significant costs on third parties, and these costs are not considered by the parties directly involved in originating risky mortgages (Apgar, Duda, and Gorey 2005; Gramlich 2007).

10. In fact, a common assumption of these models, as in Shapiro 1986 or Rogerson 1983, is that quality is chosen at the time of entry and cannot be changed thereafter, so that enforcement of standards on incumbents is meaningless.
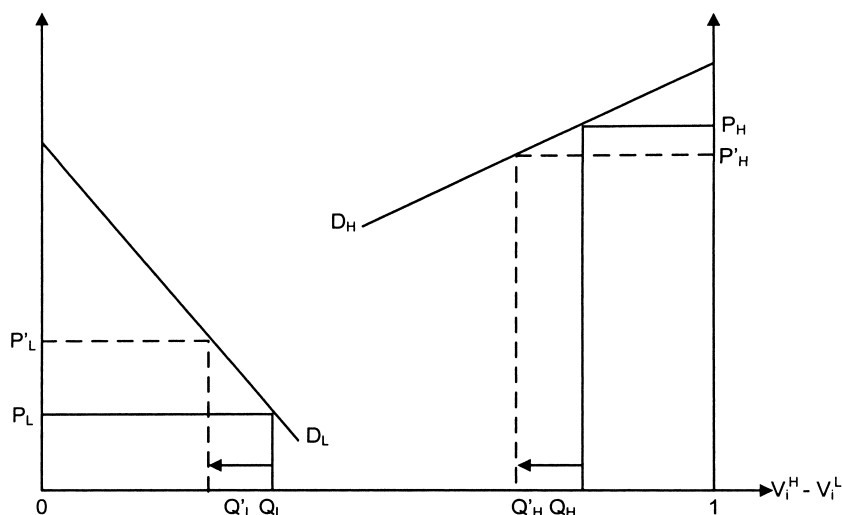
Fig. 6.2   An illustration of the possible effects of raising licensing requirements

Notes: Key: V_i^L = the *i*th consumer's utility of consuming low-quality services; V_i^H = the *i*th consumer's utility of consuming high-quality services; Q_L = the quantity of services in the low-quality-only market; Q_H = the quantity of services in the high-quality-only market; P_L = the price of services in the low-quality-only market; P_H = the price of services in the high-quality-only market; D_L = the demand curve for services in the low-quality-only market; D_H = the demand curve for services in the high-quality-only market (shown in mirror image).

change benefits some consumers, such as those with high preferences for quality, and harms others.

In some of the new models, licensing requirements take the form of unspecified fixed costs controlled by the licensing authority, broadly similar to typical licensing requirements such as payment of an annual licensing fee or maintenance of a surety bond. In one highly cited model (Shapiro 1986), skill affects the relative cost of producing high-quality services, and licensing takes the more specific form of a minimal human capital requirement, similar to actual requirements that entrants—and sometimes incumbents—take certain training programs or pass an exam. Apart from these special fixed costs, entry into and exit out of the occupation are unrestricted, which ensures that providers earn zero profits in equilibrium.

The basic idea is as illustrated in figure 6.2, which is loosely based on Shapiro (1986). The horizontal axis represents a fixed unit mass of consumers uniformly distributed from lowest preference for quality services, corresponding to zero, to highest, corresponding to one. Each consumer consumes one unit of service per period.[11] Consumers can choose among

---

11. Other models allow the total number of consumers and thus aggregate demand to vary; see Garcia-Fontes and Hopenhayn (2000).

three markets: a market for mature producers known to sell high-quality services, a market for mature producers known to produce low-quality services, and a market for young producers whose quality of service (low or high) is not known by the consumer at time of purchase. The figure shows the aggregate demand curve for services in the low-quality-only market relative to the left vertical axis (with number of units demanded measured to the right of the origin on the horizontal axis) and for services in the high-quality-only market in mirror-image form relative to the right vertical axis (with units of demand measured to the left of the point [1,0] on the horizontal axis). In the initial steady-state equilibrium, a quantity Q_L is sold in the low-quality-only market for price P_L, a quantity Q_H is sold in the high-quality-only market for price P_H, and a quantity $1-Q_L-Q_H$ is sold in the mixed-quality market at the blended price $[Q_L/(Q_L + Q_H)] \cdot P_L + [Q_H/(Q_L + Q_H)] \cdot P_H$ (whose weights reflect the proportions of low- and high-quality producers in the economy, which also prevail among the new practitioners in the mixed market in steady state).

Suppose an increased fixed cost (which might be a human capital requirement) is imposed by the licensing authority. This makes low-quality production unprofitable at the initially prevailing prices. In the new steady state, there are fewer mature low-quality producers, represented by Q'_L, and a higher price in the low-quality-only market, or P'_L. With no other changes, this would raise the blended price in the mixed-quality market and cause lifetime profits for high-quality producers to exceed zero. Hence more producers choose to be high quality, raising output in the high-quality-only market to Q'_H and lowering price there to P'_H. Consumers in the interval between Q_H and 1 are clearly better off in the new steady state, because they consume the same high-quality service as in the initial steady state but at a lower price. By similar logic, consumers in the interval between 0 and Q'_L are clearly worse off. This illustrates how, in asymmetric models, licensing tends to generate Pareto-noncomparable outcomes. However, the new models resemble the previous simple model in predicting, typically, that both the average quality and the average price of services within the regulated industry will rise as licensing requirements are tightened. Thus, compared to the simple model, the asymmetric-information models add more realistic assumptions about what licensing gatekeepers can see or control and yield deeper insights into the welfare effects of licensing, but their predictions regarding quality and price are similar.[12]

12. A possible effect not explicitly illustrated here is that the passage of tougher regulations not only raises providers' costs but also shifts out the demand for their services, by enhancing consumers' confidence that these services are of good quality. In the model underlying figure 6.2, this effect would operate in the market for young providers whose quality is not yet known. An outward shift in demand would accentuate the increase in the price of services, boosting provider incomes. In more general models where the total number of providers is endogenous, this effect can offset the direct effect of higher production costs, so that the overall effect of tighter regulation on the number of providers becomes ambiguous.

In applying any of these theories to mortgage broker licensing, it is important to consider what would be observed in the credit market if mortgage brokers provided higher-quality services. The nature of the service is to match a borrower and lender efficiently, so that loans are made with a favorable combination of greater gains from trade and/or lower search-plus-processing costs than if a broker had not been involved (Yavas 1994; Li 1998). However, because credit markets are also subject to information asymmetries, the credit market results of high-quality brokering are potentially counterintuitive. For example, higher quality might include that the broker provides the lender with more complete and accurate information about the borrower, so that loans are underwritten and priced more accurately. If so, it is conceivable that better brokers could be associated with a higher proportion of high-priced loans in the credit market, because lenders would be more willing to price risk rather than ration credit if they had more trust in the information brokers were submitting. In other words, the quality of mortgage brokering can affect the breadth of the credit market and thus the range of creditworthiness among loan applicants and recipients, and this can complicate the impact of higher-quality brokering on some credit market outcomes.

However, if we control for the creditworthiness of loan applicants, better brokering would presumably be associated with lower search- and processing-related costs, such as a lower percentage of loan applications being denied, a lower rate of bad matches that lead to delinquency or foreclosure, and a shorter time between loan application and loan closing or denial. The effects of better brokering on interest rates, controlling for creditworthiness, are less clear. Borrowers might be willing to accept higher interest rates in a brokered transaction, compared to a nonbrokered transaction, if there were more than offsetting reductions in search costs, just as lenders might be willing to accept lower interest rates if there were more than offsetting reductions in marketing and processing costs.

Previous Evaluations of the Effects of Occupational Licensing

Most studies of the influence of occupational licensing policies on the price of the occupation's service find a positive relationship (Cox and Foster 1990), sometimes with no improvement in quality. These studies cover policies ranging from restrictions on interstate mobility, such as by limiting reciprocity, to restrictions on advertising and other commercial practices (Shepard 1978; Feldman and Begun 1978; Bond et al. 1980; Kleiner, Gay, and Greene 1982). A review of empirical research on licensing found that licensing is associated with consumer prices that are 4 to 35 percent higher, depending on the type of commercial practice and location (Kleiner 2006). In cross-sectional studies, the overall impact of occupational licensing on wages in licensed relative to unlicensed occupations was found to be about 10 to 12 percent, with some estimates as high as 15 to 17 percent (Kleiner

2006; Kleiner and Krueger 2008). Kleiner and Kudrle (2000), for example, found that tougher state-level restrictions and more rigorous pass rates for dentists were associated with hourly wage rates that were 15 percent higher than in states with few restrictions, with no measurable increase in observable quality. Similarly, Barker (2007) found that higher state educational standards for real estate brokers "raise broker income without improving the quality of service."

Although some general patterns can be seen, the range of outcomes described in existing studies suggests that the effects of occupational licensing are sensitive to the form and strictness of regulations as well as to the nature of the occupation. Thus, the effects of mortgage broker licensing need to be directly measured. We are aware of only two studies that attempt to do this (El Anshasy, Elliehausen, and Shimazaki 2005; Backley et al. 2006), and both are inconclusive, in part due to limits in their data on mortgage broker licensing.

6.4   Measurement of Mortgage Broker Licensing

To associate mortgage broker licensing with market outcomes, we need measurements of the extent of mortgage broker licensing. We rely heavily on Pahl's (2007) compilation of these regulations in the fifty states and the District of Columbia for the period 1996 to 2006. Pahl shows that a wide range of licensing provisions may apply to mortgage brokerage firms (typically partnerships, LLCs, or corporations) and sole proprietors, such as:

1. The entity's *controlling individual(s)* may be required to be of minimum age; maintain in-state residency; meet minimums for professional prelicensing education, experience, or examination results; provide evidence of ethical fitness and absence of criminal background; and/or complete required continuing education.

2. The entity may be required to name an individual as *managing principal,* and the managing principal may be subject to requirements similar to those for controlling individuals as well as to requirements to maintain a minimum net worth or surety bond or to obtain a license as an individual mortgage broker or loan officer.

3. The entity itself may be required to maintain a minimum net worth or a surety bond. Entities, sole proprietors, controlling individuals, and managing principals may be required to pay fees for licensing, application processing, application investigation, or license renewal.

4. Entities and sole proprietors may be required to meet minimum physical office requirements, such as maintaining a physical office in states where they operate. To open a branch office, entities and sole proprietors may be required to provide notification, obtain a license or certificate, pay various fees, maintain branch-specific amounts of net worth and/or surety bonds,

and/or name a branch manager who may be required to meet provisions similar to those discussed previously for managing principals. In some states, the loan officers who work for mortgage brokerage firms may also be required to meet standards of the same type as those listed earlier for managing principals, but often at a lower level. Additional provisions may specify that a loan officer can only work for one firm at a time. However, some states allow certain other professionals, such as real estate agents or attorneys, to engage in some aspects of mortgage brokering without obtaining a specific mortgage broker license; these exemptions may be subject to limits on the maximum number or volume of loans brokered.

For each state and the District of Columbia for each year from 1996 through 2006, Pahl assigns an integer value for the intensity of each of twenty-four regulatory components. Most of the components deal with human capital requirements. For example, regarding the controlling individuals in mortgage broker firms, Pahl codes separate intensities for prelicensing education, prelicensing experience, prelicensing examinations, and continuing education requirements. She codes the same four variables for managing principals, branch managers, and the firms' employees, for a total of sixteen human capital components. Three components reflect, respectively, the degree of individual licensing required of managing principals, branch managers, and employees. At the firm level, Pahl codes the intensity of both net worth and surety bonding requirements and separately codes the intensity of surety bonding required for branches. Finally, she codes whether an in-state office is required and the extent of exemptions that allow other professions to engage in mortgage brokering activities.

We use two overall indices of the intensity of mortgage broker regulation in a state: a simple sum of all twenty-four of Pahl's individual intensity values (the *summated rating scale*) and a statistically weighted index (*Rasch index*).[13] In a reduced-form sense, we can capture the major regulatory provisions affecting the occupation using both linear (summated rating scale) and nonlinear (Rasch index) measures of the system.

In addition to these composite indices, we also examine subsets of Pahl's twenty-four regulatory components.[14] Much of our analysis includes a dollar-valued measure of the bonding and net worth regulations, which we

13. This index is from a Rasch-type model (Andrich 1988) that places each of the variables within a logical structure based on frequency of outcome and an integer scale. The empirical measure of the Rasch model we use is known as a partial credit model, a nonlinear model that assigns weights that are consistent with an implicit structure to the regulatory system. This approach assumes that the distance between parameters is equal and that the categories are equal integers. The development of the Rasch scale uses maximum likelihood estimation to calculate a unique index for each state.

14. The anatomy of the regulatory system for brokers by state is generally consistent. Simple correlations among the individual items in our index were mostly positive, and a large number were statistically significant. None of the negative correlations among the components of the index were statistically significant.

Table 6.1   **Rankings of top and bottom five regulated states and changes using the summated rating scheme by state**

Top 5 regulated states 2004	
Florida	16
Montana	14
New Jersey	13
Ohio	12
Texas	12
North Carolina	12
Nevada	12
Bottom 5 regulated states 2004	
Colorado	0
Wyoming	0
Alaska	0
South Dakota	1
Maine	2
Top 5 states by change in regulation 1999–2004	
Montana	14
Texas	12
North Carolina	11
Oklahoma	8
Connecticut	7
Nevada	7
Utah	7

created by examining the details of each state's requirements and selecting what we judged to be the smallest dollar option by which new entrants could meet the bonding and net worth requirements.[15] We sometimes pair this measure with an index of all other requirements, constructed by subtracting the bonding and net worth indices from the composite indices. We have also examined other subindices and individual components, such as for the provisions regarding training and examinations, provisions that apply only to the management of brokerage firms, provisions that limit brokerage firm branches, and provisions that apply only to employees of brokerage firms. As discussed in appendix D, some of these other regulatory variables were significant in regressions with one or more of our labor and mortgage market dependent variables, and in a few cases their presence materially weakened the significance of the bonding and net worth variable. Further research on some of them seems warranted, but we focus on the bonding and net worth provisions because we judged them to show the broadest and most consistent pattern of significant relationships with market outcomes.

Table 6.1 shows the top and bottom five states ranked by the restrictiveness of their summated scale of mortgage broker licensing. Florida has the

15. The values we chose are listed in appendix A. Our focus on the barriers facing small entrants aligns with the evidence noted earlier that during most of our study period the industry grew on the extensive margin while the average mortgage brokerage remained small.
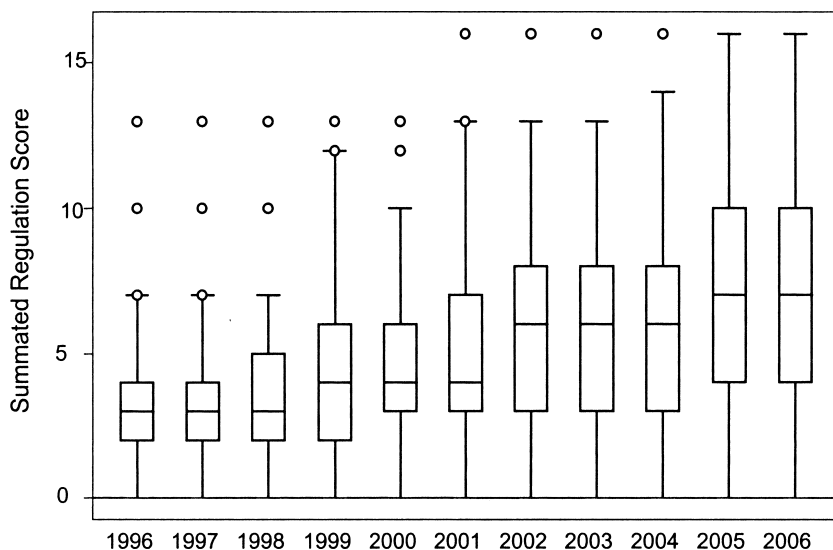
Fig. 6.3   Growth and variation of occupational regulation by state over time

Notes: This box-and-whisker plot shows annual values of the median, interquartile range, and outliers of the summated rating scale derived from Pahl's (2007) catalogue of state (and District of Columbia) mortgage broker regulations. The line in the middle of the box represents the median. The bottom and top edges of the box are the first and third quartile, respectively. The whiskers extending from the box represent the most extreme point within the range of one-and-a-half times the interquartile range (the difference between the third and first quartile). The remaining points represent outliers that do not fall within the range of the whiskers.

most statutory provisions regulating mortgage brokers. The five states with the least restrictive statutes in 2004, such as Alaska and Wyoming, are less populous. Texas and Montana had the greatest increase in the regulation of mortgage brokers during the period 1999 to 2004. In general, larger industrial states were more likely to impose regulatory provisions on mortgage brokers.

Figure 6.3 shows the more general growth and variation of regulation over time from 1996 to 2006, using a box-and-whisker plot. The mean value of the summated rating scale for all states was 3.2 in 1996 and increased to almost 8 by 2005. The variations in state practices also rose. As the membership in the occupation expanded in response to growth in the demand for broker services, more states began regulating the members of the occupation. This may have occurred because members in the occupation sought regulation or because of public concern about brokers allegedly charging excessive fees or leading customers into overly risky loans.

Because of their significance for our analysis, it is important to understand the nature of bonding requirements.[16] When brokers are required to have a

16. For background on the market for surety bonds in general and mortgage broker surety bonds in particular, see www.jwsuretybonds.com.

bond of, say, $50,000, this typically means that they pay an annual premium, ranging from several hundred to a few thousand dollars, to a surety bond company. It does not mean that the broker must own and place in trust a fixed-income security with a market value of $50,000. Under specified conditions of broker nonperformance of duties spelled out in the governing laws and regulations, third parties, such as the broker's customers, may collect up to the amount of the bond from the surety company. The role of the surety company is to ensure that a valid claim will be promptly paid.[17] If this occurs, the surety company will seek full compensation from the broker for the amount it paid out to the third party, plus expenses. The broker's annual premium is thus a fee paid to guarantee a line of contingent credit up to a legally required amount. In setting the annual premium it charges a broker, a surety company considers both the expected value of claims against the broker and the probability of collecting from the broker for any amounts paid out. Consequently, the bond company may conduct detailed screening of applicants, similar to credit underwriting, before issuing the bond.

We speculate that this screening could make bonding one of the most significant barriers to entry in states requiring bonds of $50,000 and more, especially given that the educational requirements for mortgage brokers may not be very demanding. Some support for this view comes from Barker's (2007) finding that state bonding requirements mattered in a related occupation—real estate brokerage—where they were associated with higher-quality service, as measured by a lower rate of consumer complaints. An industry expert, David Olson (2007), provides additional support. He notes that one factor that kept mortgage brokers from originating many Federal Housing Administration (FHA) mortgages was FHA's requirement that originators provide a formal audit, costing about $5,000 each year.[18] He suggests that more mortgage brokers would originate FHA loans if this audit requirement were dropped in favor of having brokers maintain a $75,000 surety bond. For established mortgage brokers with good credit, the cost of this bond would be about $750, but Olson notes that "Brokers with low net worth and fewer years in the business will have a more difficult time getting a bond at all." In such cases, the broker could seek a more costly bond from a surety company that specializes in serving higher-risk clients, but their premiums often reach 10 to 15 percent of the amount of the bond,

17. Surety companies investigate the validity of claims before paying out. We are referring here to claims they consider valid.

18. The FHA's audit requirement may, in part, illustrate Milton Friedman's point, discussed previously, that occupational regulations affect not only consumers within the regulated sector but also those who turn to substitute products as a result of the regulations. During this decade's housing boom, the FHA lost market share to less regulated subprime mortgage lenders. This occurred for many reasons, but one reason was that many brokers chose not to meet the FHA's standards and thus did not market FHA loans to their clients. We are not saying that the FHA should have lowered its requirements for brokers. We are simply noting that the FHA's unilateral maintenance of a relatively high audit requirement may have contributed to consumers being served by non-FHA brokers, and that this seems to illustrate Friedman's point that occupational licensing can shift demand toward less regulated providers.

compared to 1 to 2 percent for low-risk mortgage brokers. Thus, on just a $50,000 bond, a high-risk premium could match or exceed the $5,000 audit cost that Olson judged to be prohibitive for most brokers.

6.5 Methods

We fit multivariate statistical models of mortgage broker labor market variables and consumer mortgage market variables. These two classes of dependent variables are regressed on measures of state mortgage broker regulations and variables intended to control for other factors affecting these markets. Our analysis takes two main forms: panel data analyses using repeated annual cross sections of labor and mortgage market data, and cross-sectional analyses of hundreds to thousands of individual mortgages issued in 2005. Most of the panel data regressions utilize just state-level average data, but for mortgage broker earnings we combine observations on individual mortgage professionals with state-averaged data. The panel data regressions allow for fixed effects in each state as well as time trends. State-level fixed effects cannot be included in our cross-sectional regressions, due to collinearity with our regulatory variables. As a check on our results, we reestimate our cross-sectional regressions on a sample restricted to mortgages just in metropolitan statistical areas (MSAs) that cross state boundaries, so that we can include MSA fixed effects.

6.6 Results

6.6.1 Panel Data Results for Labor Market Variables

Table 6.2 provides descriptive statistics for key labor market variables as well as other mortgage market and regulatory variables used in our analysis. The table shows the growth in occupational regulation and a measure (from the annual American Community Survey [ACS]) of hourly wages and earnings of mortgage brokers and related lending professionals.[19] We take advantage of the variation across both space and time to analyze relationships between the intensity of licensing and key labor market variables such as mortgage brokers' employment (relative to the population) and earnings. These relationships could be either positive or negative, based on the theories discussed pre-

19. The ACS is conducted annually by the Census Bureau and replicates the long form on the decennial Census. It provides large samples of individuals, even for relatively detailed occupational classifications such as loan officers and brokers. As a check on the results using the ACS, we also use the Occupation Employment Survey (OES), which produces employment and wage estimates for over 800 occupations by state on a biennial basis from 1999 on. The OES also includes a category for loan officers and brokers. In both the ACS and OES, the data we use include mortgage loan officers and agents, collection analysts, loan servicing officers, and loan underwriters. These state OES figures are highly correlated ($r = .81$) with the National Mortgage Broker Association's count of membership by state. Similar high correlations were found between National Mortgage Broker Association memberships and the ACS figures we use.

Table 6.2   **Summary statistics for the labor market, service market, and legal and bonding provisions**

State-level and individual variables	2000 Mean (Standard deviation)	2005 Mean (Standard deviation)
Broker/loan officer hourly wage	20.12	25.15
	(12.74)	(16.87)
Annual broker/loan officer earnings	40,973.43	52,748.68
	(26,177.80)	(41,526.24)
Employment (loan officers and brokers/ population, %)	.15	.17
	(.06)	(.17)
Years of experience	18.49	19.51
	(10.54)	(11.51)
Years of schooling	14.54	14.69
	(1.79)	(1.80)
Mean number of loans	537,109.57	736,032.00
	(679,999.52)	(880,192.82)
Mean number of subprime loans	13,995.13	95,726.69
	(15,213.93)	(129,101.6)
Mean number of loans in foreclosure	6,214.27	8,580.52
	(8,883.82)	(9,444.91)
Mean state population	5,471,375.84	5,757,977.29
	(6,101,905.36)	(6,498,035.30)
Median household income	$58,574.57	$63,504.76
	(7,641.51)	(10,326.91)
Licensing index (1996)	2.33	
	(1.96)	
Licensing index (2005)	6.84	
	(3.68)	
Bonding/net worth index (2000)	1.70	
	(1.37)	
Bonding/net worth index (2005)	1.88	
	(1.35)	
Real bonding/net worth requirement (1996)	$15,825.12	
**base year 2000	(18,963.83)	
Real bonding/net worth requirement (2005)	$27,479.08	
**base year 2000	(25,928.68)	

viously. An additional complication, not reflected in the theoretical models, is that brokers may accelerate entry into the occupation before the standards become fully effective, leading to a spurious positive relationship between subsequent regulation and the number of practitioners in the short run.[20]

We begin by relating regulation to the employment of brokers and related

20. This was the case in accounting, where anticipated new regulations resulted in a surge of applicants just before more stringent education requirements took effect (Cummings and Rankin 1999).

Table 6.3   **Fixed-effects models of loan officer employment/population by state (ACS data)**

	(1)	(2)
Summated regulation index lagged once (no net worth/bonding)/100	0.068 (0.206)	0.058 (0.173)
Real net worth/bonding requirement lagged once/1,000,000	−0.545 (0.431)	−0.795 (0.350)**
Summated regulation index lagged twice (no net worth/bonding)/100	−0.026 (0.235)	
Real net worth/bonding requirement lagged twice/1,000,000	−0.418 (0.403)	
Mean experience by state	−0.004 (0.003)	−0.004 (0.003)
Mean experience by state squared/10,000	0.993 (0.659)	0.994 (0.658)
Mean years of school by state	−0.001 (0.005)	−0.001 (0.005)
Lag median state household income/100,000	0.218 (0.162)	0.211 (0.161)
Lag state unemployment rate	0.010 (0.006)*	0.010 (0.006)*
Lag state home ownership percentage	−0.001 (0.002)	−0.002 (0.002)
Constant	0.172 (0.176)	0.187 (0.175)
Year dummy controls (2001–2005) base 2000	Yes	Yes
Observations	300	300
Number of states	50	50
R^2	0.12	0.11
F-Test on one- and two-period lags of summated index	0.06	—
F-Test for one- and two-period lags of bonding/net worth	3.16**	—

Notes: Standard errors in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

lending professionals. Table 6.3 shows the relationship between bonding and net worth requirements and state-level employment from 2000 to 2005. Our measure of employment based on the ACS is the number of mortgage brokers and related lending professionals per capita by state. We use pooled time series and cross-sectional data that allow us to estimate fixed-effects models with a set of human capital, labor market, and service market state controls.[21] Our results show that the bonding/net worth requirement is sig-

21. We find that neither the linear summated rating scale nor the Rasch index is significantly related to mortgage broker employment at the state level. We also estimate random effects for our models (available from the authors). The basic findings hold whether the specification is fixed or random effects.

nificant and negatively associated with employment. Using the values at the mean of the distribution, we find that doubling the bonding requirement is associated with an 8 to 10 percent decrease in the number of brokers and related lending professionals in the state relative to the population.

The bonding requirement may have a stronger relationship to employment than the other licensing components, for several reasons. It may be both relatively onerous and easily enforced up front and thus may reduce entry into the occupation. We also find that states with older mortgage brokers and related lending professionals were the ones with lower per capita levels of employment within the occupation. This may simply reflect the fact that most new entrants are younger, so that impeding entry tends both to age the profession and reduce employment. It could also be that, as the occupation matures and public policies on regulation evolve, the political clout of mortgage brokers will grow, possibly leading to adoption of more rigorous educational and experience requirements that will complement those on bonding.[22]

Restricting entry could have direct effects on earnings. To examine this relationship, we estimate the association between the bonding requirements and annual earnings, using individual-level data in the ACS. Table 6.4 presents estimates of the relationship between regulation and annual earnings from 2000 to 2005, using the individual practitioner data for each year. The basic earnings equation can be stated as follows:

(1) $$\mathrm{Ln}(Earnings_{it}) = a + b_1 R_{it} + b_2 \mathbf{X}_{it} + u_{it},$$

where $Earnings_{it}$ are the annual earnings of person i in time period t; R_{it} is the tightness of mortgage broker licensing through bonding and net worth requirements in person i's state in time period t; the vector $\mathbf{X}_{it}$ includes covariates measuring characteristics of each person and state, along with year time trends; u_{it} is the error term; and a, b_1, and b_2 are the coefficients we estimate.

We find a positive relationship between mortgage broker licensing and mortgage broker earnings, ranging from an imprecisely estimated 7–8 percent to a marginally significant 6 percent.[23] As shown in the table, the coefficients on the nonregulatory explanatory variables were consistent

22. We also estimated a quasi-DID model to analyze mortgage broker employment changes in states that adopted a mortgage broker licensing law or substantially increased the restrictiveness of the law (e.g., a change of three using our summated rating scale). We found no statistically significant relationships for the summated index or the bonding variable. We think that the noise relative to signal in these change results influenced the lack of precision in these estimates, which are available from the authors.

23. Estimates for hourly earnings showed generally similar results. We use total earnings in our estimates because of the variable nature of compensation for brokers that are commission-based. In addition, since many brokers are in small offices where profits are shared, the earnings variable would capture this form of compensation. Further, as an additional test for robustness of our results, we estimated the logarithm of earnings as a dependent variable and the logarithm

Table 6.4   Pooled OLS models of log annual earnings using ACS, 2000–2005

	(1)	(2)
Summated regulation index lagged once	0.290	−0.485
(no net worth/bonding)/100	(0.520)	(0.204)**
Real bonding/net worth requirement lagged once/100,000	−0.076	0.060
	(0.099)	(0.033)*
Summated regulation index lagged twice	−0.009	
(no net worth/bonding)	(0.006)	
Real bonding/net worth requirement lagged twice/100,000	0.148	
	(0.113)	
Experience	0.057	0.057
	(0.004)***	(0.004)***
Experience squared/1,000	−1.018	−1.020
	(0.089)***	(0.090)***
Log years of school	1.262	1.263
	(0.059)***	(0.059)***
Lag median household income/1,000,000	10.823	10.786
	(1.677)***	(1.668)***
Lag state population/1,000,000	4.950	4.653
	(1.721)***	(1.702)***
Lag state unemployment rate/100	−0.231	−0.046
	(1.465)	(1.453)
State homeownership percentage/100	−0.088	−0.070
	(0.226)	(0.222)
Constant	6.430	6.407
	(0.262)***	(0.262)***
Year dummy controls (2001–2004) base 2000	Yes	Yes
Observations	6,699	6,699
R^2	0.13	0.13
F-Test on one- and two-period lags of summated index	3.54**	—
F-Test for one- and two-period lags of bonding/net worth	1.97	—

Notes: Robust standard errors in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

with the labor economics and human capital literature. In column (2), we present a standard human capital model with experience and education included, and find that the coefficient values for bonding/net worth sum to 0.06 but are not significant. Alternatively, the bonding requirements could

of the ACS measure of state population as an independent variable and found results similar to those shown in table 6.3. These estimates are also available from the authors.

    Estimates for changes in licensing and changes in wages also showed no statistically significant impact. In none of the earnings or wage estimates were the licensing index variables significant when we used state-level controls. We also estimated nonlinear models of the licensing variables, and they were also not significant. Further, tests using the OES found significance for the licensing variables only when the $\mathbf{X}_{it}$ controls are omitted. The estimates also are available from the authors.

affect selection into the occupation, potentially restricting entry to more educated and experienced brokers. In this case, education and experience of brokers could be outcomes of regulation that should not be controlled in the earnings regression. With this specification, the bonding/net worth coefficient is statistically significant at the .10 level with a value of 0.06. This suggests that bonding requirements also may influence the level of education and experience and that may be, in part, impacting the earnings of brokers.

In the following, we find that tighter bonding/net worth requirements also are associated with lower volumes of loans processed and a higher percentage of high-priced loans originated. One interpretation of this set of results is that the demand for mortgage broker services is approximately of unit elasticity, so that as the numbers of brokers and loans processed contract, brokers' fees per loan processed rise by enough to just offset the lower loan volume and higher operating costs that result from tighter licensing, leaving the average broker's net earnings only slightly higher.

6.6.2   Panel Data Results for Mortgage Market Variables

We also investigated the relationship between mortgage broker licensing and the volume of subprime lending and rate of mortgage foreclosures. As discussed previously, stricter licensing could reduce the number of subprime loans, for example, by restricting the number or work effort of mortgage brokers. Alternatively, stricter licensing could boost effective loan demand by enhancing the quality of broker services and thereby increasing the willingness of marginal borrowers to step forward. To probe these potential outcomes, we estimated the following model:

$$(2) \qquad \text{Ln(sp-loans originated}_{it}) = \alpha + \beta_1 R_{it} + \beta_2 \mathbf{X}_{it} + \mu_{it},$$

where sp-loans originated$_{it}$ is the number of new subprime mortgages in state i over period t; R_{it} are the state-level mortgage broker licensing indices in time period t; the vector $\mathbf{X}_{it}$ includes covariates measuring the characteristics of each state, along with year time trends; μ_{it} is the error term; and α, β_1, and β_2 are the coefficients we estimate. Subprime loans originated were measured as the number of all originations in a state for a given year that were made by lenders on the U.S. Department of Housing and Urban Development's list for that year, or for the most recent prior year available, of institutions whose mortgage activity is primarily in the subprime market.

The state fixed-effects results estimated over 2001 to 2005 with the bonding/net worth requirements are presented in table 6.5. The results show that the two-lag specification of bonding requirements is associated with fewer loans originated. These estimates are consistent with those on employment. We find that imposing bonding requirements correlates with fewer brokers and fewer subprime loans originated in the state. Quantitatively, our coefficients imply that a doubling of the mean bonding requirement

Table 6.5   **Fixed effects estimates of the log of state subprime loan originations**

	(1)	(2)
Summated regulatory index lagged once	−0.023	−0.020
(no net worth/bonding)	(0.011)**	(0.010)*
Real net worth/bonding requirement lagged once/100,000	0.104	−0.321
	(0.253)	(0.223)
Summated regulatory index lagged twice	−0.002	
(no net worth/bonding)	(0.012)	
Real net worth/bonding requirement lagged twice/100,000	−0.741	
	(0.219)***	
Lag state unemployment rate	−0.017	−0.014
	(0.034)	(0.035)
Lag state population/100,000	0.024	0.022
	(0.010)**	(0.010)**
Lag median state household income/100,000	0.622	0.511
	(0.938)	(0.965)
State home ownership percentage	0.050	0.049
	(0.012)***	(0.012)***
Constant	4.661	4.823
	(1.048)***	(1.076)***
Year dummy controls (2002–2005) base 2001	Yes	Yes
Observations	254	254
Number of states (including D.C.)	51	51
R^2	0.76	0.74
F-Test on one- and two-period lags of summated index	2.78*	—
F-Test for one- and two-period lags of bonding/net worth	6.91***	—

Notes: Standard errors in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

to approximately $54,000 would be associated with a cut in the number of subprime loans originated by about 220,000 per year in 2004, or approximately 9 percent.

If there are fewer loans with stricter licensing, does the quality of those loans, as measured by fewer negative outcomes—such as foreclosures—also vary with licensing requirements? If state licensing improves the quality of broker services, the effects might include more appropriate loan selection and more accurate loan underwriting, resulting in fewer foreclosures. Alternatively, foreclosures could be positively correlated with tighter licensing, perhaps because a reduced availability of brokers leads to less accurate underwriting or because states that have higher foreclosure rates for other reasons (e.g., low or volatile incomes) are more likely to enact tighter restrictions. To assess these possibilities, we estimate two versions of the following model with regard to owner-occupied properties, one for just subprime mortgages and one for all mortgages:

(3) $$\text{Home Foreclosures}_{it} = \alpha + \beta_1 R_{it} + \beta_2 \mathbf{X}_{it} + \mu_{it},$$

where Home Foreclosures$_{it}$ is the percentage of mortgages (on owner-occupied properties) in foreclosure for state i over period t (as measured in the National Delinquency Survey of the Mortgage Bankers Association of America, 1979 to 2005); R_{it} are the state-level measures of mortgage broker bonding/net worth requirements in time period t; the vector $\mathbf{X}_{it}$ includes covariates measuring characteristics of each state, along with year time trends; μ_{it} is the error term; and α, β_1, and β_2 are the coefficients we estimate.

As shown in table 6.6 for the estimation period January 1999 through 2004, we find a significant positive relationship between bonding/net worth requirements and foreclosure rates for both subprime and all mortgages

Table 6.6   **Fixed-effects models of the percentage of loans (subprime and all loans) in foreclosure**

	(1) Subprime	(2) Subprime	(3) All loans	(4) All loans
Summated reg. index lagged once (no net worth/bonding)	0.022 (0.093)	0.004 (0.078)	0.016 (0.016)	0.021 (0.014)
Real net worth/bonding requirement lagged once/100,000	1.357 (1.585)	3.186 (1.245)**	0.217 (0.280)	0.540 (0.226)**
Summated reg. index lagged twice (no net worth/bonding)	−0.100 (0.104)		0.013 (0.018)	
Real net worth/bonding requirement lagged twice/100,000	3.659 (1.598)**		0.476 (0.283)*	
Lag state unemployment rate	0.873 (0.224)***	0.970 (0.196)***	0.222 (0.040)***	0.251 (0.036)***
Lag state population/100,000	−0.005 (0.069)	−0.059 (0.055)	−0.032 (0.012)***	−0.033 (0.010)***
Lag median state household income/100,000	−5.080 (6.709)	−7.396 (6.059)	−1.560 (1.187)	−3.003 (1.100)***
State home ownership percentage	−0.292 (0.087)***	−0.319 (0.080)***	−0.057 (0.015)***	−0.057 (0.014)***
Constant	27.444 (7.197)***	28.629 (6.168)***	6.617 (1.273)***	6.673 (1.120)***
Year dummy controls (2000–2004) base 1999	Yes	Yes	Yes	Yes
Observations	255	306	255	306
Number of States (including D.C.)	51	51	51	51
R^2	0.66	0.63	0.42	0.43
F-Test on one- and two-period lags of summated index	0.50	—	1.46	—
F-Test for one- and two-period lags of bonding/net worth	5.51***	—	3.29**	—

Notes: Standard errors in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 6.7   **Hazard model estimates of time to adoption of a net worth or bonding bill 1998–2005 (Using a Weibull distribution of duration)**

	(1)	(2)	(3)	(4)
Avg. percent of subprime loans in foreclosure1998–2000	0.17 (0.19)	0.15 (0.26)		
Avg. percent of all loans in foreclosure 1998–2000			0.53 (0.75)	0.98 (1.25)
Avg. state unemployment rate 1998–2000		0.186 (0.386)		0.185 (0.390)
Avg. state population 1998–2000/1,000,000		–0.030 (0.062)		–0.050 (0.072)
Avg. state median household income 1998–2000/1,000		–0.047 (0.062)		–0.042 (0.064)
Avg. state homeownership percentage 1998–2000		–0.005 (0.085)		0.003 (0.089)
Constant	–3.742 (1.274)***	–2.029 (7.921)	–3.422 (1.113)***	–2.858 (8.308)
Observations	17	17	17	17

Notes: Standard errors in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

when state-level labor market and service market factors are also controlled for. The estimates are consistent with the view, discussed previously, that occupational regulation reduces the quality of an occupation's output. However, our results do not clarify the mechanism by which mortgage broker bonding would lead to higher foreclosures.

We have noted that the positive relationship between bonding and foreclosures could arise because states enact bonding or net worth requirements in response to previous periods of high foreclosure. As a check on this possibility (Autor 2003), we estimated the relationship between lagged subprime and lagged overall foreclosures and subsequent passage of a bonding or net worth requirement. Table 6.7, using a Weibull hazard model with similar covariates to those in tables 6.5 and 6.6, shows that the relationship is not statistically significant, indicating an absence of this form of simultaneity bias.[24]

One final issue we address in this section is presented in table 6.8, which shows the relationship of bonding/net worth requirements to home ownership. Using the same type of model as table 6.6, we estimate the relationship

24. Appendix B discusses evidence that the political initiatives leading to higher mortgage broker bonding requirements are often led by industry associations or state regulators rather than consumer groups, although consumer issues and competing consumer regulatory proposals sometimes serve to motivate mortgage broker associations to put forward their own bonding proposals. Causality may involve complicated feedback chains and substantial time delays.

Table 6.8   **Fixed-effects models of state home ownership percentage**

	(1)	(2)
Real bonding/net worth requirement lagged once/100,000	0.881	1.206
	(1.154)	(0.943)
Real bonding/net worth requirement lagged twice/100,000	0.582	
	(1.188)	
Lag state unemployment rate	–0.194	–0.191
	(0.155)	(0.155)
Lag state population/100,000	0.066	0.066
	(0.043)	(0.043)
Lag median state household income/100,000	10.896	11.029
	(4.778)**	(4.763)**
Constant	61.428	61.415
	(3.004)***	(2.999)***
Year dummy controls (2000–2004) base 1999	Yes	Yes
Observations	306	306
Number of states (including D.C.)	51	51
R^2	0.26	0.26
F-Test for one- and two-period lags of net worth/bonding requirements	0.94	—

Notes: Standard errors in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

of mortgage broker bonding/net worth requirements and home ownership. We find that income is positively related to home ownership, but that there is no statistically significant relationship between our measures of regulation and home ownership. Although bonding may matter for the quantity and quality of subprime mortgages, it does not seem to vary with the overall rate of state home ownership. This might reflect the fact that mortgage originations are flow variables and hence can change more from year to year than a stock variable like home ownership.

6.6.3   Cross-Sectional Data Results for Mortgage Market Variables

Brokers have short-term incentives to sell high-priced loans to consumers. The federal banking regulators track high-priced loans through the Home Mortgage Disclosure Act (HMDA) data collection, which records most home mortgage applications and originations in the United States. We focus on first-lien mortgages in our analysis. A high-priced first-lien mortgage is defined as one whose annual percentage rate (APR) is 3 or more percentage points above the contemporaneous thirty-year Treasury bond yield. The APR is defined essentially as an internal rate of return, taking into account initial fees and introductory rates and setting any index variables

in the contract at current market values, assuming they remain constant for the scheduled maturity of the loan.

If mortgage broker licensing succeeds in protecting consumers, high-priced loans may be reduced.[25] However, as discussed in our theory section, this is not the only possible outcome, and the theoretical effects of licensing regulations are ambiguous.

We assess the empirical relationship between mortgage broker regulation and the probability that a mortgage will be high priced. We primarily consider broker-originated loans. We could, in addition, assess how broker regulation affects the chance that any mortgage, brokered or not, is high priced. This also would be plausible, since mortgage brokers compete strongly with other mortgage origination providers. However, looking at the entire mortgage market could weaken our ability to detect the direct effects of mortgage broker regulation, so we prefer to focus as closely as we can on broker-originated mortgages.

Focusing on brokered mortgages, however, confronts us with the problem that the HMDA data do not indicate whether a mortgage was brokered. We use two strategies to proxy for this missing information. For federally regulated banks and thrifts, we use the borrowers' location (available at the Census tract level from the HMDA data) to condition on whether the loan was made outside the lender's Community Reinvestment Act (CRA) assessment area. Under the CRA, federally regulated banks and thrifts must declare an assessment area where the degree of services they provide will be evaluated for compliance with the CRA. Typically these areas include the lender's principal retail offices, and lenders generally have fewer offices outside their assessment area. Federally regulated lenders are presumed to rely on their retail offices to originate the majority of their mortgages within their assessment areas but to rely much more on brokers to reach mortgage customers outside their assessment areas (Avery, Brevoort, and Canner 2006; Apgar, Bendimerad, and Essene 2007). Accordingly, for federally regulated banks and thrifts, we focus on mortgages originated outside each reporting lender's CRA assessment area.[26]

For mortgage banks not subject to the CRA, we rely on reports from industry publications and industry experts to identify a set of lenders known to rely almost exclusively on mortgage brokers for loan applications. For one lender, Option One, we have confirmed with a senior employee that in 2005, the year we study, the firm obtained almost all of its mortgage applica-

25. Two separate studies, based on proprietary data from selected major lenders' mortgages originated in 2002, suggest that, on average, consumers using brokers did get lower-priced loans than other borrowers, when other factors were controlled for. See El Anshasy, Elliehausen, and Shimazaki (2005) and LaCour-Little (2007b). Results to the contrary were found by LaCour-Little (2007c).

26. To keep the size of the data set manageable, we used a 50 percent random sample of the 2005 HMDA data from CRA-regulated mortgage originators.

tions through brokers. An industry expert, Thomas LaMalfa of Wholesale Access, helped us identify nine other "broker-dependent" mortgage originators in 2005: Taylor, Bean, and Whitaker Mortgage Co.; First Magnus Financial Corporation; American Mortgage Network; Loan City; Green Point Mortgage Funding; Argent Mortgage Company; New Century Mortgage Corporation; Nova Star Home Mortgage; and Résumé.[27]

In tables 6.9 and 6.10, we estimate linear probability models for whether a loan is high-priced using four different data sets.[28] We cluster observations by states to compute robust standard errors that allow for less than full independence among the observations in each state. We control for the state regulatory environment, borrower's income and racial/ethnic identity, the loan amount, and several economic and demographic properties of the Census tract where the property is located (the distribution of credit scores, unemployment rate, median age, median age of housing stock, percent minority population, median income, and the percentage of owner-occupied and vacant housing units).

For mortgage refinancing, the results are fairly consistent. However, there is a clear difference in the size of the constant term, which is low for the CRA lenders outside their assessment areas (0.10) and higher for the ten broker-dependent lenders (0.38). The 2005 national average was 0.26 for first-lien refinance mortgages. Although this gives a very different starting point to the two refinancing regressions, the marginal effects of many of the explanatory variables are similar. The coefficients on the mortgage broker regulatory variables for 2004 are of primary interest here. In tables 6.9 and 6.10, the coefficient on the bonding/net worth requirement is positive and significant, indicating that a $100,000 increase in this requirement is associated with, respectively, a 5.4 or a 3.5 percentage point increase in the probability that a refinancing is high priced. The coefficient on the index of other mortgage broker regulations is not significant in table 6.9 but is marginally significant at a 10 percent level, with a negative coefficient, in table 6.10.

Our results for two other regulatory variables—an index of state anti-predatory lending laws and an indicator of states that prohibit deficiency judgments—are also consistent across the refinancing regressions in tables 6.9 and 6.10. The coefficient on the index of anti-predatory lending laws is negative but not significant at a 10 percent level. The coefficient on the indicator of no deficiency judgments is significant but with an unexpected negative sign, suggesting that high-priced loans are less likely in states that do not allow creditors to pursue deficiency judgments. A possible explanation

27. Their respective HMDA respondent ID numbers are 7499100008; 7979400002; 1788100000; 7428900001; 13-3210378; 1917700009; 7900200006; both 1512400000 and 1707500002 for Nova Star; and 1991500005. To make the data more manageable, we again took a 50 percent random sample.
28. We have estimated probit models for each of these regressions and obtained very similar results.

Table 6.9 **Linear probability of a high-priced loan in a cross section of ten broker-dependent lenders mortgages**

	Mortgage refinance ($N = 273,365$)	Home-purchase mortgage ($N = 185,773$)
State broker bonding/net worth requirement ($100,000)	0.054 (0.021)**	0.050 (0.028)*
Index of other state broker licensing requirements	0.002 (0.003)	0.002 (0.003)
Index of state anti-predatory lending laws	−0.012 (0.008)	0.004 (0.009)
State prohibition of deficiency judgments (dummy variable)	−0.130 (0.029)***	−0.098 (0.027)***
Borrower's income ($1,000)	−0.505 (0.077)***	−0.280 (0.068)***
Borrower's income squared ($1,000,000)	0.093 (0.020)***	0.035 (0.011)***
Adults in Census tract with very low credit score (%)	0.005 (0.001)***	0.006 (0.001)***
African-American borrower (dummy variable)	0.146 (0.018)***	0.173 (0.011)***
Asian-American borrower (dummy variable)	−0.060 (0.019)***	−0.032 (0.023)
Hispanic borrower (dummy variable)	0.074 (0.013)***	0.119 (0.019)***
Female borrower (dummy variable)	0.039 (0.006)***	0.163 (0.006)***
Constant	0.382 (0.073)***	0.537 (0.069)***
Number of state clusters for standard errors (D.C. included)	51	51
R^2	0.095	0.107

Notes: Standard errors in parentheses. Ordinary least-squares estimate of the probability that a mortgage is high-priced, using a 50 percent random sample of HMDA data on first-lien conventional mortgages originated in 2005 by ten broker-dependent lenders. The sample is further restricted to HMDA loan records in which the primary applicants' ethnicity, sex, and race are available and applicable to a person (not a business) and in which the property is an owner-occupied, one to four family nonmanufactured unit. Additional explanatory variables not presented include loan size; loan size squared; dummy variables indicating if the borrower is Hawaiian/Pacific Islander or American Indian/Alaska Native; percentage of credit files in the Census tract that lack a credit score; tract-level Census variables for the unemployment rate, median age of persons, median age of housing units, percent minority population, median income, percentage of housing units that are owner-occupied, and percentage of housing units that are vacant. Full results are available upon request. See appendix C for more detailed definitions of the variables.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 6.10   **Linear probability of a high-priced loan in a cross section of CRA-regulated lenders' mortgages made outside their CRA assessment areas in 2005**

	Mortgage refinance ($N = 625{,}573$)	Home-purchase mortgage ($N = 523{,}464$)
State broker bonding/net worth requirement ($100,000)	0.035 (0.014)**	–0.011 (0.016)
Index of other state broker licensing requirements	–0.0029 (0.0017)*	–0.0008 (0.0015)
Index of state anti-predatory lending laws	–0.006 (0.004)	0.0005 (0.0046)
State prohibition of deficiency judgments (dummy variable)	–0.060 (0.024)**	0.016 (0.017)
Borrower's income ($1,000)	–0.272 (0.022)***	–0.183 (0.035)***
Borrower's income squared ($1,000,000)	0.034 (0.004)***	0.035 (0.006)***
Adults in Census tract with very low credit score (%)	0.0058 (0.0005)***	0.0062 (0.0004)***
African-American borrower (dummy variable)	0.211 (0.015)***	0.344 (0.015)***
Asian-American borrower (dummy variable)	0.002 (0.010)	–0.012 (0.012)
Hispanic borrower (dummy variable)	0.093 (0.013)***	0.197 (0.013)***
Female borrower (dummy variable)	0.044 (0.002)***	0.028 (0.002)***
Constant	0.103 (0.032)***	0.010 (0.040)
Number of state clusters for standard errors (D.C. included)	51	51
R^2	0.093	0.141

Notes: Standard errors in parentheses. Ordinary least-squares estimate of the probability that a mortgage is high priced, using a 50 percent random sample of HMDA data on first-lien conventional mortgages originated in 2005 by lenders subject to the Community Reinvestment Act. The sample is further restricted to HMDA loan records in which the primary applicants' ethnicity, sex, and race are available and applicable to a person (not a business) and in which the property is an owner-occupied, one- to four-family nonmanufactured unit. Additional explanatory variables not presented include loan size; loan size squared; dummy variables indicating if the borrower is Hawaiian/Pacific Islander or American Indian/Alaska Native; percentage of credit files in the Census tract that lack a credit score; tract-level Census variables for the unemployment rate, median age of persons, median age of housing units, percent minority population, median income, percentage of housing units that are owner occupied, and percentage of housing units that are vacant. Full results are available upon request. See appendix C for more detailed definitions of the variables.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

is that lenders ration credit more strictly in states that rule out deficiency judgments but use risk-based pricing to lend to a wider selection of applicants where they have the right to pursue a deficiency judgment.[29]

The coefficient on the percentage of adults in the Census tract of the mortgaged property who have very low credit scores is consistently positive and significant in tables 6.9 and 6.10. A 10 percentage point increase in the percentage of adults in the tract with a very low score is associated with about a 5 to 6 percentage point increase in the probability that a mortgage refinance loan in that tract will be high priced.[30]

African-American, Hispanic, and female borrowers are significantly more likely to get a high-priced mortgage refinancing than are non-Hispanic white male borrowers. The largest effect is for African-American borrowers. For example, for mortgage refinance loans by federally regulated banks and thrifts lending outside their CRA assessment areas, the probability of a high-priced loan increases by 21 percentage points for an African-American borrower, compared to increases of 9 percentage points for Hispanics and 4 percentage points for women. For other racial groups we find no significant effects, except that Asian-Americans refinancing with the ten broker-dependent lenders are about 6 percentage points less likely to get a high-priced loan.

Our results for the regulatory variables are not as strong or as consistent with home-purchase mortgages as with mortgage refinance loans. We again start with very different constant terms. However, the bonding/net worth variable is positive and significant at a 10 percent level for the ten broker-dependent lenders but has an insignificant and small negative coefficient for the CRA-regulated lenders on loans outside their assessment areas. The index of the remaining mortgage broker regulations is insignificant in the home-purchase regressions, as is the index of anti-predatory lending laws. The indicator of no deficiency judgments is again negative and significant for the broker-dependent lenders, but it is now insignificant for the CRA-regulated lenders' loans outside their assessment areas. Apparently, the process for making home-purchase loans differs in important ways from the process for making mortgage refinance loans, at least at the CRA-regulated institutions.[31]

In results not shown, but available from the authors, we repeated the estimates in table 6.10 for mortgages made within the CRA assessment areas of

29. We thank Karen Pence for bringing this possibility to our attention.

30. In the full regression results underlying tables 6.9 and 6.10, the coefficient on another credit score variable—the percentage of adults with a credit file who lack a credit score—is significantly positive but smaller for the CRA-regulated lenders but not significant for the ten broker-dependent lenders.

31. For the home-purchase mortgages examined in table 6.10, the coefficients on the credit score and racial/ethnic variables have a pattern of statistical significance not too different than for the mortgage refinance loans in table 6.9, although the size of the coefficients often differs substantially.

CRA-regulated lenders. None of the regulatory variables were statistically significant, except the coefficient on the indicator of no deficiency judgments was significant and positive for home-purchase mortgages. The insignificance of the mortgage broker regulation variables in these regressions is consistent with our presumption that loans within a CRA assessment area are much less likely to involve a mortgage broker. We have no clear explanation yet for why the results for the indicator of no deficiency judgments change. As Avery, Brevoort, and Canner (2006) note, CRA-regulated lenders' mortgage underwriting appears to be quite different inside, compared to outside, their assessment areas. They speculate that one explanation may be the use of differing marketing channels, including greater use of brokers outside assessment areas.

To limit the potential effects of unmeasured location-specific effects, we reestimate with a sample restricted to only observations in MSAs that straddle state borders, similar to the methods in Holmes (1998) and Bostic et al. (2007). We have data on fifty-one MSAs that cross state boundaries, touching parts of thirty-nine states.[32] We estimate the same equations as in tables 6.9 and 6.10 but with fixed effects for each MSA, which has the advantage of controlling for location-specific factors not measured by our other variables, such as the percentage of loans with adjustable rates or the level or rate of change in housing prices (LaCour-Little 2007a). This is useful, because the nature of our interest rate data (a single cross section) precludes controlling for these factors by means of state fixed effects (because they would be collinear with our state-level policy variables).

For the data from the broker-dependent lenders, the results on the sample from multistate MSAs for the bonding variable (and most of the other variables) are similar to those in table 6.9.[33] In particular, for mortgage refinancing loans by the broker-dependent lenders, the coefficient on the state broker bonding variable has a t-statistic of 2.05 and a coefficient of 0.048, compared to 0.054 in table 6.9. For home-purchase mortgages from the same lenders, the coefficient on the bonding variable has a 1.96 t-statistic and a coefficient of 0.041, compared to 0.050 in table 6.9. By contrast, for the sample from multistate MSAs, the results (with fixed effects) for refinanced mortgages by the CRA lenders outside their assessment areas include an insignificant coefficient of just 0.01 on the bonding variable, in contrast to the significant coefficient of 0.035 in table 6.10. For home-purchase loans by CRA lenders outside their assessment areas, the coefficient on the bonding variable is

32. Alabama, Arkansas, Delaware, District of Columbia, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

33. The parallels are even closer if we estimate on just the split MSAs but without fixed effects.

–0.004 and insignificant for the multistate MSA sample with fixed effects, very similar to the results in table 6.10.

Thus the results for table 6.9, with data almost exclusively on broker-originated loans, are reasonably robust to location-specific effects not explicitly controlled for in our model. These results are also robust to the omission of data from the twelve states without multistate MSAs, including California. However, the same is not true of our results for mortgage refinance loans by CRA lenders outside their assessment areas, which probably consist of a mixture of broker-originated and other loans. The coefficient on the bonding variable for those loans becomes marginally insignificant when observations from the twelve states without border-crossing MSAs are dropped from the full sample or when estimated on the multistate MSA sample without fixed effects. With fixed effects on the multistate MSA sample, the coefficient becomes clearly insignificant.

6.7 Conclusions

Mortgage brokers are an emerging regulated occupation in the United States. About thirty years ago, there were almost no mortgage brokers, because individuals who wanted a loan to buy or refinance a house went to a bank or savings and loan. With deregulation of financial services and technology improvements that allowed easy development and dissemination of credit scores, this picture began to change, and in 2004 as much as two-thirds of all housing finance was initiated through a mortgage broker.

We examine the relationships between state regulation of mortgage brokers and outcomes in the labor and mortgage markets. We find that the relationship between mortgage broker licensing and market outcomes differs among the types of licensing requirements; in particular, financial bonding or net worth requirements are associated with somewhat higher earnings, modest reductions in the number of mortgage brokers, and the number of subprime loans originated as well as with somewhat higher foreclosure rates and higher interest rates on brokered loans.

Further analysis is needed to more clearly establish whether these relationships are robust and whether they reflect a causal link between broker regulation and market outcomes. However, we would draw attention to a few features of the results presented previously. First, the overall pattern of our results suggests that requiring mortgage brokers to maintain a surety bond or a minimum net worth may affect market outcomes, and that the net effects may not benefit consumers. Without a deeper understanding of the causal linkages underlying our statistical associations, we cannot say that bonding requirements are a bad idea, but we think our results underscore the need for both more research on this topic and a cautious approach to imposing additional restrictions on entry into the mortgage broker business and occupation.

Our study period ends in 2006, just as U.S. foreclosure rates on nonprime adjustable rate mortgages began to surge. Financial markets have reacted by raising the cost and cutting the availability of funding for both subprime and mortgage-broker-originated mortgages. State regulators have tightened regulations on mortgage contracts, mortgage origination, and mortgage broker licensing as well, and the Housing and Economic Recovery Act of 2008 brings federal oversight to mortgage broker licensing. Anecdotal and industry sources indicate that the number of mortgage brokers and their market share have fallen substantially as a result. We speculate that these developments could be part of a broader process by which the linkages between mortgage broker regulation and market outcomes may well strengthen over time. Such a result would be consistent with the findings of Law and Kim (2005) that showed that during the early periods of occupational regulation in the United States, the monopoly impacts were modest. As in other occupations that have evolved with near universal licensing in the states, surviving mortgage brokers could also eventually benefit through higher earnings and the ability to control entry. We anticipate that further analysis of the issue, with updated statutes, statistical techniques, and better measures of monitoring of the occupation, may help policymakers assess the quality impacts and monopoly implications of state regulations and whether federal regulation would provide a better solution for consumers as well as the emerging occupation of mortgage brokers.

Appendix A

Table 6A.1   Minimum bond plus net worth requirements (current dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
AL	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000
AK	0	0	0	0	0	0	0	0	0	0	0
AZ	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
AR	50,000	50,000	50,000	50,000	60,000	60,000	60,000	60,000	75,000	75,000	75,000
CA	0	0	0	0	0	0	0	0	0	0	0
CO	0	0	0	0	0	0	0	0	0	0	0
CT	40,000	40,000	40,000	40,000	40,000	40,000	65,000	65,000	65,000	65,000	65,000
DE	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
DC	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500
FL	0	0	0	0	0	0	0	0	0	0	0
GA	25,000	25,000	25,000	25,000	25,000	25,000	25,000	50,000	50,000	50,000	50,000
HA	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
ID	20,000	20,000	20,000	20,000	20,000	20,000	20,000	10,000	25,000	25,000	25,000
IL	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	70,000	70,000	70,000
IN	25,000	25,000	25,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
IA	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
KS	0	0	0	25,000	25,000	50,000	50,000	50,000	50,000	50,000	50,000
KY	25,000	25,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
LA	0	25,000	25,000	25,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ME	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	25,000	25,000
MD	12,500	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
MS	0	0	0	0	0	0	0	0	0	0	0
MI	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
MN	0	0	0	0	0	0	0	0	0	0	0

(continued)

Table 6A.1   (continued)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
MS	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
MO	20,000	20,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
MT	0	0	0	0	0	0	0	0	25,000	25,000	25,000
NE	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	100,000
NV	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
NH	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
NJ	75,000	100,000	100,000	100,000	100,000	100,000	150,000	150,000	150,000	150,000	150,000
NM	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
NY	0	0	0	0	0	0	0	0	10,000	10,000	10,000
NC	0	0	0	0	0	0	50,000	50,000	50,000	50,000	50,000
ND	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
OH	25,000	25,000	25,000	25,000	25,000	25,000	50,000	50,000	50,000	50,000	50,000
OK	0	0	0	0	0	0	0	0	0	0	0
OR	10,000	10,000	10,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
PA	0	0	0	0	0	0	0	0	0	0	0
RI	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
SC	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
SD	0	0	0	0	0	0	0	0	0	0	0
TN	50,000	50,000	50,000	50,000	50,000	115,000	115,000	115,000	115,000	115,000	115,000
TX	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	25,000
UT		0	0	0	0	0	0	0	0	0	0
VT		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	25,000	25,000
VA	5,000	5,000	5,000	5,000	5,000	25,000	25,000	25,000	25,000	25,000	25,000
WA	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
WV	0	0	0	0	25,000	25,000	50,000	50,000	50,000	50,000	50,000
WI	0	0	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
WY	0	0	0	0	0	0	0	0	0	25,000	25,000

Appendix B

Some Evidence on the Politics of Enacting Higher Bonding Requirements

To examine the potential endogeneity of mortgage broker regulations, we gathered some legislative history information from industry sources and regulators in eight states that have raised their bonding requirements at least once. Overall, these conversations suggest a somewhat long and complicated chain of legislative causality. Successful efforts to raise bonding requirements tend to originate from the mortgage broker industry or from state regulators rather than directly from consumer groups. However, consumer advocacy and issues still can motivate the industry or regulatory proposals, and there are also some signs of grass-roots industry opposition to proposals made by state mortgage broker associations. In addition, the gestation time between an initial legislative proposal and final passage and implementation may span several years, so that any market outcomes that may have initiated the legislative process may have changed by the time of implementation. Consumer issues seem to serve as the background from which industry and regulatory agency-initiated bonding requirements emerge, often via a multiyear process.

Of the nine increases we discussed, five were described as first proposed or drafted by the state's mortgage broker association (Ohio 1999; Texas 1999; North Carolina 2002; Idaho 2004; Montana 2004), and four were described as initiated by the state regulatory authority (New Jersey 2001; Tennessee 2001; Ohio 2002; Minnesota 2007). The distinction is somewhat blurred by the industry's frequent practice of vetting its proposals with state regulators, which often yields at least technical drafting suggestions but sometimes yields more affirmative legislative support from the regulator. No successful bonding proposal was said to have been opposed by state regulators. Sometimes earlier proposals that had not been vetted with the regulator had failed. As a result, regulators have been involved, actively or passively, in most of the successful bonding bills we examined.

The stated motivations of the industry and the regulators differed. Industry proposals were described as attempts to make the occupation more professional and to provide a degree of consumer protection by inhibiting some forms of fraud, thereby enhancing the occupation's reputation. However, industry-supported increases to bonding requirements were sometimes (e.g., North Carolina 2002) motivated on narrow grounds, such as to ensure that consumers could be compensated if a broker absconded with the relatively small amount of cash the customer had entrusted to the broker, but not to help the consumer collect on larger judgments for less narrow forms of fraud or negligence. By contrast, proposals initiated by the regulatory authorities tended to have bonding requirements that were higher and broader in scope,

with the apparent intentions of providing both more resources to compensate consumers and more incentives for appropriate broker behavior.

None of our sources (which did not include consumer groups) suggested that the bonding requirement that passed had been either first proposed or subsequently opposed by consumer advocates. However, the industry's proposal in Texas was in part a response to a much higher bonding proposal previously introduced by a legislator on the grounds of consumer protection, and in at least two other cases (North Carolina 2002; Ohio 1999) the industry's proposal was said to be motivated in part by competing regulatory proposals (not including bonding) from consumer groups. Opposition to the bonding bills that passed was said to be limited and mainly from legislators who were concerned that it might be onerous enough to hurt their constituents in the business. In some cases, this was thought to reflect, in part, grass-roots lobbying by mortgage brokers at odds with their own industry association's position.

Appendix C

Data for High-Priced Lending Regressions

Sources: The data for the high-priced lending regressions come from multiple sources. The dependent variable and several explanatory variables are from data on individual first-lien mortgages originated in 2005 and reported per the requirements of the Home Mortgage Disclosure Act (HMDA)(2007). The HMDA data include the Census tract of the property securing the mortgage. Using this information, each loan record has also been associated with Census data for the loan's census tract. In addition, staff of the Board of Governors of the Federal Reserve System allowed us to link the loan records to data on the distribution of credit scores in each Census tract as of December 2004. Three types of "state" (including District of Columbia) regulatory variables are also used: an index of anti-predatory lending laws developed by Bostic et al. (2007), an indicator from Pence (2003) on whether the state's standard foreclosure process (as of the late 1990s) allows for deficiency judgments, and indicators of state regulations on mortgage brokers taken from Pahl (2007). All state variables are set according to the state in which the property securing the mortgage is located.

Dependent Variable

High-Priced Loan Indicator: Using the HMDA records, it is set to 1 if the mortgage meets the HMDA definition of a "high-priced" mortgage and zero otherwise. In 2005, a first-lien mortgage was high-priced if its annual percentage rate (APR, or basically the internal rate of return on scheduled

mortgage payments over the full term of the loan, assuming all market interest rates referenced in the contract are unchanged) exceeds by 3 percentage points or more the average rate on a thirty-year Treasury bond for the month in which the mortgage was originated (as determined by a reference rate published by the federal banking regulatory agencies).

Explanatory Variables Shown in Tables 6.9 and 6.10

State broker bonding/net worth requirement: Constructed by the authors from information in Pahl (2007), this is the monetary value of the minimum bond or net worth required, in 2004, to enter the mortgage broker business, converted to units of hundreds of thousands of dollars for our statistical analysis. Because some states' requirements differ by characteristics of the firm or individual being licensed, the choice of the minimum amount needed to enter is subject to judgment. The dollar values we selected for this variable for each state (before conversion to units of hundreds of thousands of dollars) are listed in appendix B.

Index of other state broker licensing requirements: This is an index of the strictness of a state's mortgage broker regulations in 2004 that sums all of Pahl's individual regulatory components except those dealing with net worth or bonding.

Index of state anti-predatory lending laws: An index of the overall strictness of a state's anti-predatory lending laws, designed for use with 2004 and 2005 HMDA data (Bostic et al. 2007).

State prohibition of deficiency judgments: From Pence, an indicator variable set to 1 if a state's standard foreclosure procedure bars creditors from pursuing deficiency judgments when sale of a foreclosed property yields less than the amount owed by the borrower, and zero otherwise.

Borrower's income: The borrower's income, as stated in the HMDA loan record, in $1,000.

Adults in Census tract with very low credit score: In the loan's Census tract, a measure of the percentage of adults with a very low credit score. Specifically, 100 times the number of such adults divided by all adults with a credit score.

African-American, Asian-American, Hispanic, or female borrower: Dummy variables set to 1 if, respectively, the borrower's race is African-American, the borrower's race is Asian-American, the borrower's ethnicity is Hispanic, or the borrower is female, as indicated by the HMDA loan record's information on the lead applicant for the loan. (Information on coapplicants is ignored; loan records with missing or "not applicable" ethnicity information are omitted.)

Additional Explanatory Variables in the Regressions

Loan size: The amount borrowed, as stated in the HMDA loan record, in $1,000.

Adults with a missing credit score: In the loan's Census tract, a measure of the percentage of adults without a credit score. Specifically, 100 times the number of adults whose credit file lacks a credit score divided by the number of adults with a credit file.

Unemployment rate: From Census 2000, the unemployment rate in the loan's Census tract.

Median age: From Census 2000, the median age of all persons in the loan's Census tract.

Median age of housing units: From Census 2000, the median age of all structures in the loan's Census tract.

Minority percentage: From Census 2000, the percentage of minority population in the loan's Census tract. (Minority signifies all but those who identify as only non-Hispanic white.)

Median income: From Census 2000, median family income in the loan's Census tract, in $1,000.

Owner-occupied percentage: From Census 2000, owner-occupied housing units as a percentage of all housing units in the loan's Census tract.

Vacant-unit percentage: From Census 2000 records, vacant housing units as a percentage of all housing units in the loan's Census tract.

Appendix D

Results with Alternative Measurements of Mortgage Broker Regulation

In this chapter, we have focused on the relationship between mortgage broker bonding or net worth requirements and market outcomes, largely because we think that these relationships are relatively consistent and statistically significant, compared to the relationships between market outcomes and the other components of mortgage broker regulation. In tables 6.3, 6.4, 6.5, 6.6, 6.9, and 6.10, for example, the variable for licensing requirements other than bonding/net worth performs inconsistently. It is significant (and different in sign from the bonding variable) in tables 6.4 and 6.5, and the mortgage refinancing column of table 6.10, but not significant in tables 6.3, 6.6, and 6.9, and the home purchase column of table 6.10. However, using this index to summarize all of the mortgage broker regulations besides bonding or net worth requirements might obscure some strong, consistent relationships between individual components and market outcomes, just as our overall index of mortgage broker regulation obscured the results we have presented on bonding and net worth. To assess this possibility, we have reestimated a core set of our regression specifications, consisting of the one-lag versions of tables 6.3, 6.4, 6.6, and 6.9 and the two-lag version of table

6.5. We modify these regressions to include twenty other mortgage broker regulatory components, using the following specification of the mortgage broker variables:

1. The same bonding/net worth variable as in tables 6.3, 6.4, 6.5, 6.6, and 6.9.
2. Pahl's index for individual mortgage broker regulation component j, where j ranges over twenty regulatory components other than bonding and net worth.
3. A summated index of all the mortgage broker regulatory components not included in 1 and 2.

At the firm level, the components assessed are entry requirements for education, experience, or knowledge (via an examination) of the firm's principals as well as ongoing requirements for continuing education of the principals. For firms' managers, we assess similar requirements and an overall dummy variable indicating whether any requirements apply to managers. Requirements assessed for branch managers and for employees parallel those for managers, and we also assess the requirement to maintain an in-state office location.

We find that these specifications generally have little effect on the size or significance of the coefficient on our bonding/net worth variable. That is, the results we have presented on the relationship between bonding or net worth requirements and market outcomes are nearly always robust to the alternative specifications described previously. Most of the individual components are significant for at least one of the seven labor and mortgage market relationships tested. (Tables 6.6 and 6.9 include two market outcomes each, with both subprime and all foreclosures in table 6.6 and both refinance and home purchase mortgages in table 6.9.) However, only six of the twenty components are significantly related to three or more outcomes, and only employee regulation provisions matter for most labor and mortgage market outcomes. We will briefly summarize some of the relationships that seem of potential interest for further research.

The relationships between our bonding/net worth variable and market outcomes were generally robust. The coefficient on this variable retained its sign and at least a 10 percent significance level in all of the new specifications for tables 6.3 (number of brokers), 6.5 (subprime originations), and 6.6 (foreclosures). In table 6.4 (broker earnings), the bonding/net worth variable was only marginally significant. Not surprisingly, the p-value for its coefficient rose from below 10 percent in table 6.4 to between 10 and 20 percent in nine of the twenty alternative regressions. Its coefficient changed little in most of these cases and never fell below 0.43, compared to 0.60 in table 6.4.

In the alternative regressions for table 6.9 (high-priced loans in 2005), the bonding/net worth variable retained its positive sign and at least a 10 percent significance level except when the alternative variable was either the overall

dummy for presence of employee regulation or the requirement for continuing education for branch managers. The effect of the employee regulation dummy in the refinance mortgage regression was somewhat marginal; it lowered the coefficient for bonding/net worth from 0.054 to 0.047 and raised its p-value to 15 percent. It had a stronger effect in the purchase mortgage equation, cutting the coefficient in half and raising its p-value to 50 percent. The employee regulation dummy seems to parallel the bonding/net worth variable in equation 9, in that its coefficient is also positive. For purchase mortgages it is also significant, with a p-value of 7.2 percent. The requirement for branch manager continuing education had similar effects on the size and significance of the bonding/net worth coefficient and also became significant itself (p-value of 5.5 percent) in the purchase mortgage equation. However, its relationship to high-price loans was negative, –0.08. One possible explanation for the significance of the branch manager continuing-education variable is that it is nonzero for only four states. Because table 6.9 is a cross-sectional regression where we cannot estimate state fixed effects, the branch manager continuing-education variable may be reflecting general fixed effects for those four states. Data for additional years are needed to better resolve this question. These two exceptions in table 6.9 and the unsurprising sensitivity of the marginally significant results from table 6.4 show the need for further research on the relationship of bonding or net worth and market outcomes. We nonetheless consider our main results on these relationships to be relatively robust, in light of the many alternative specifications we tested.

Are other components of mortgage broker regulation also related to our labor and mortgage market outcomes? Not to the same degree, with the possible exception of the overall dummy variable for employee regulation. This regulatory indicator is significant at a 10 percent level or better in six of the seven alternative regressions, excluding only the one for higher-priced refinance mortgages from table 6.9. In five of the six cases, where its coefficient was significant its coefficient was of the same sign as the coefficient on the bonding/net worth variable. Only for brokers' earnings did it differ, with a coefficient of –0.05 (p-value 4.3 percent). This component of mortgage broker regulation merits further research, although its statistical relationships with market outcomes (fewer brokers, fewer subprime mortgages, and more foreclosures) suggest caution about regarding it as a pro-consumer measure. Some of the individual components of employee regulation, such as the entry requirements for education, experience, or passage of an examination, paralleled the overall employee regulation dummy in many cases but were not as consistently significant across the seven regression estimates.

Only one other regulatory component was individually significant for both a labor market outcome and a mortgage market outcome. This component, the educational background of new branch managers, was significantly associated with fewer brokers, more subprime originations, and fewer

2005 high-priced home purchase mortgages. We are inclined to discount the importance of these results because this regulatory indicator was nonzero in only two states, Florida and Nevada, as of 2004.

The other individual regulatory components with significant effects mainly affected the mortgage market but not the labor market. The human capital entry requirements for firm managers (education, experience, examinations) are perhaps the most interesting in this group. Nineteen states imposed at least one of these requirements in 2004, and the experience requirement was significant in the alternative regressions for subprime originations, subprime and total foreclosures, and 2005 high-priced home-purchase mortgages. In all four cases, the coefficient on the manager experience requirement was opposite to the coefficient on the bonding/net worth variable, or at least superficially more pro-consumer. The overall dummy for the presence of manager requirements parallels the manager experience requirement in the two foreclosure regressions. Likewise, the requirement that the brokerage firm maintain an in-state office was associated with fewer subprime originations and more subprime and total foreclosures. These regulatory factors also seem to be candidates for further research.

Two other human capital requirements for branch managers—experience and continuing education—were significant (and opposite in sign to the bonding/net worth coefficient) in the alternative mortgage market regressions for subprime originations, foreclosures, and 2005 high-priced home-purchase mortgages. We have already noted that branch manager continuing education requirements prevailed in only four states as of 2004, but the branch manager experience variable was nonzero in eight states and may thus be of some interest for future research.

We omit a full discussion of the results for the third mortgage variable in each regression, the index of the remaining mortgage broker regulation requirements.[34] For the table 6.3 alternative regressions, it was significant in only two cases. For table 6.4, it was often significant (nine of seventeen cases) when it directly or indirectly (via the overall employee regulation dummy) included the employee education and examination indicators but not when these moved from the index to become the individual component. In both tables 6.3 and 6.4, when the index was significant, its coefficient was opposite in sign to the bonding/net worth coefficient. In table 6.5 alternative regressions, the first lag of the index was significant in thirteen of fifteen cases when an employee regulation was not the individual variable but in only one of the five cases when an employee requirement became the individual component. (Its second lag was never significant.) In all cases, the coefficient on the index agreed in sign with the bonding/net worth coefficient. In the table 6.6 alternative regressions, the index was significant in three cases for subprime

---

34. These and other detailed results from our alternative regressions are available from the authors.

foreclosures (with a coefficient of opposite sign for the in-state office and overall employee regulation variables) and in seven cases for total foreclosures (with a coefficient of opposite sign for the overall employee regulation variable). In the alternative regressions for table 6.9, the index was generally insignificant, except in some of the home-purchase mortgage regressions with a managerial human capital variable as the individual component.

The results in this appendix show that our chapter has far from exhausted the information in our data. We highlight, in particular, that opportunity for other researchers to create and analyze alternative indices and subindices of mortgage broker regulation from the extensive regulatory history in Pahl (2007).

References

Akerlof, G. 1970. The market for lemons: Qualitative uncertainty and the market mechanism. *Quarterly Journal of Economics* 84 (August): 488–500.

Alexander, W. P., S. D. Grimshaw, G. R. McQueen, and B. A. Slade. 2002. Some loans are more equal than others: Third-party originations and defaults in the subprime mortgage industry. *Real Estate Economics* 30 (4): 667–97.

Andrich, D. 1988. *Rasch models for measurement.* Newbury Park, CA: Sage.

Apgar, W., A. Bendimerad, and R. S. Essene. 2007. Mortgage market channels and fair lending: An analysis of HMDA data. Harvard University, Joint Center for Housing Studies Working Paper MM07-2, April 25.

Apgar, W. C., M. Duda, and R. N. Gorey. 2005. *The municipal cost of foreclosures: A Chicago case study.* Homeownership Preservation Foundation Housing Finance Policy Research Paper 2005-1, February.

Autor, D. 2003. Outsourcing at will: The contribution of unjust dismissal doctrine to the growth of employment outsourcing. *Journal of Labor Economics* 21 (1): 1–42.

Avery, R. B., K. P. Brevoort, and G. B. Canner. 2006. Higher-priced home lending and the 2005 HMDA data. *Federal Reserve Bulletin,* September.

Backley, C., J. M. Niblack, C. J. Pahl, T. C. Risbey, and J. Vockrodt. 2006. License to deal: Regulation in the mortgage broker industry. Federal Reserve Bank of Minneapolis, *Community Dividend,* Issue no. 3.

Barker, D. 2007. Ethics and lobbying: The case of real estate brokerage. *Journal of Business Ethics* 80 (1): 23–35.

Bond, R. S., J. E. Kwoka Jr., J. J. Phelan, and I. T. Whitten. 1980. Effects of restrictions on advertising and commercial practice in the professions: The case of optometry. Staff Report, Bureau of Economics, Federal Trade Commission, Washington, D.C.

Bostic, R. W., K. C. Engel, P. A. McCoy, A. Pennington-Cross, and S. M. Wachter. 2007. State and local anti-predatory lending laws: The effect of legal enforcement mechanisms. Paper presented at the Federal Reserve System Community Affairs Research Conference. 29–30 March, Washington, D.C.

Conference of State Bank Supervisors. 2007. 40 state agencies commit to participate in nationwide mortgage licensing system. Available at: http://www.csbs.org/AM/

Template.cfm?Section=Press_Releases&TEMPLATE=/CM/ContentDisplay .cfm&CONTENTID=12840.

Cox, C., and S. Foster. 1990. *The costs and benefits of occupational regulation.* Washington, D.C.: U.S. Federal Trade Commission, Bureau of Economics.

Cummings, J., and L. J. Rankin. 1999. 150 hours: A look back. *Journal of Accountancy* 187 (4): 53–58.

El Anshasy, A., G. Elliehausen, and Y. Shimazaki. 2005. The pricing of subprime mortgages by mortgage brokers and lenders. In *Promises and pitfalls: As consumer finance options multiply, who is being served, and at what cost?* Papers from the 2005 Federal Reserve System Community Affairs Research Conference. Available at: www.chicagofed.org/cedric/files/2005_conf_paper_session1_elliehausen.pdf.

Engel, K. C., and P. A. McCoy. 2002. A tale of three markets: The law and economics of predatory lending. *Texas Law Review* 80 (6): 1255–1367.

Ernst, K., D. Bocian, and W. Li. 2008. Steered wrong: Brokers, borrowers, and subprime loans. Center for Responsible Lending report, April 8.

Essene, R. S., and W. Apgar. 2007. Understanding mortgage market behavior: Creating good mortgage options for all Americans. Harvard University, Joint Center for Housing Studies Working Paper MM07-1, April 25.

Feldman, R., and J. W. Begun. 1978. The effects of advertising: Lessons from optometry. *Journal of Human Resources* 13 (Supplement): 247–62.

Friedman, M. 1962. *Capitalism and freedom.* Chicago: University of Chicago Press.

Garcia-Fontes, W., and H. Hopenhayn. 2000. Entry restrictions and the determination of quality. *Spanish Economic Review* 2 (2): 105–27.

Gerardi, K., H. S. Rosen, and P. Willen. 2007. Do households benefit from financial deregulation and innovation? The case of the mortgage market. NBER Working Paper no. 12967. Cambridge, MA: The National Bureau of Economic Research, March.

Gramlich, E. M. 2007. *Subprime mortgages: America's latest boom and bust.* Washington, D.C.: The Urban Institute Press.

Guttentag, J. 2000. Another view of predatory lending. University of Pennsylvania, The Wharton School, Financial Institutions Center Working Paper 01-23-B, August 21.

Holmes, T. 1998. The effect of state policies on the location of manufacturing: Evidence from state borders. *Journal of Political Economy* 106 (4): 667–705.

Home Mortgage Disclosure Act. 2007. Available at: http://www.ffiec.gov/hmda/online _rpts.htm.

Jackson, H. E., and L. Burlingame. 2007. Kickbacks or compensation: The case of yield spread premiums. *Stanford Journal of Law, Business, and Finance* 12 (2): 289–361.

Jacobides, M. G. 2005. Industry change through vertical disintegration: How and why markets emerged in mortgage banking. *Academy of Management Journal* 48 (3): 465–98.

Kandel, E., and E. Lazear. 1992. Peer pressure and partnerships. *Journal of Political Economy* 100 (4): 801–17.

Kim-Sung, K., and S. Hermanson. 2003. Experiences of older refinance mortgage loan borrowers: Broker- and lender-originated loans. AARP Public Policy Institute Research Report, January.

Kleiner, M. M. 2006. *Licensing occupations: Enhancing quality or restricting competition.* Kalamazoo, MI: Upjohn Institute for Employment Research.

Kleiner, M., R. Gay, and K. Greene. 1982. Barriers to labor migration: The case of occupational licensing. *Industrial Relations* 21 (3): 383–91.

Kleiner, M. M., and A. B. Krueger. 2008. The prevalence and effects of occupational licensing. NBER Working Paper no. 14308. Cambridge, MA: National Bureau of Economic Research, September.

Kleiner, M. M., and R. T. Kudrle. 2000. Does regulation affect economic outcomes? The case of dentistry. *Journal of Law and Economics* 43 (2): 547–82.

Kroszner, R. S. 2007. Legislative proposals on reforming mortgage practices. Testimony before the Committee on Financial Services, U.S. House of Representatives, October 24.

LaCour-Little, M. 2007a. Economic factors affecting home mortgage disclosure act reporting. Unpublished document, Department of Finance, College of Business and Economics, California State University Fullerton, July 28.

———. 2007b. The home purchase mortgage preferences of low-and-moderate income households. *Real Estate Economics* 35 (4): 265–90.

———. 2007c. The pricing of mortgages by brokers: An agency problem? Preliminary Working Paper, Department of Finance, College of Business and Economics, California State University Fullerton, February 5.

LaCour-Little, M., and G. H. Chun. 1999. Third-party originators and mortgage prepayment risk: An agency problem? *Journal of Real Estate Research* 17 (1/2): 55–70.

Law, M. T., and S. Kim. 2005. Specialization and regulation: The rise of professionals and the emergence of occupational licensing regulation. *Journal of Economic History* 65 (3): 723–56.

Li, Y. 1998. Middlemen and private information. *Journal of Monetary Economics* 42 (1): 131–59.

McGarity, M. 2001. A broker's market. *Mortgage Banking* 61 (6): 32.

Mortgage Bankers Association of America. 2007. National Delinquency Survey, 1979–2005.

Olson, D. 2007. FHA: An alternative to nonprime. Available at: www.Scotsman guide.com.

Pahl, C. 2007. A compilation of state mortgage broker laws and regulations, 1996–2006. Federal Reserve Bank of Minneapolis, Community Affairs Report no. 2007-2, August. Available at: www.minneapolisfed.org/community/pubs.

Pappalardo, J. K., and J. M. Lacko. 2007. Improving consumer mortgage disclosures: An empirical assessment of current and prototype disclosure forms. Federal Trade Commission Bureau of Economics Staff Report, June.

Pence, K. M. 2003. Foreclosing on opportunity? State laws and mortgage credit. Federal Reserve Board Finance and Economics Discussion Series no. 2003-16.

Rogerson, W. P. 1983. Reputation and product quality. *The Bell Journal of Economics* 14 (2): 508–16.

Schloemer, E., W. Li, K. Ernst, and K. Keest. 2006. Losing ground: Foreclosures in the subprime market and their cost to homeowners. Center for Responsible Lending, December.

Shapiro, C. 1986. Investment, moral hazard and occupational licensing. *Review of Economic Studies* 53 (5): 843–62.

Shepard, L. 1978. Licensing restrictions and the cost of dental care. *Journal of Law and Economics* 21 (1): 187–201.

Shumer, C. 2007. Sheltering neighborhoods from the subprime foreclosure storm. Joint Economic Committee, U.S. Congress, April 13.

Sichelman, L. 2003. Brokers dominate lending. *Realty Times,* July 2. Available at: http://realtytimes.com/rtpages/20030702_lending.htm.

U.S. Department of Housing and Urban Development. 2002. Economic analysis and initial regulatory flexibility analysis for RESPA proposed rule to simplify and

improve the process of obtaining mortgages to reduce settlement costs to consumers. Office of Policy Development and Research, July.

Wholesale Access. 2005. New research about mortgage brokers published. Press release, July 28. Available at: www.wholesaleaccess.com/7_28_mbkr.shtml.

———. 2007. New broker research published. Press release, August 17. Available at: www.wholesaleaccess.com/8-17-07-prs.shtml.

Woodward, S. E. 2003. Consumer confusion in the mortgage market. Typescript, July 14. Available at: www.sandhillecon.com/pdf/consumer_confusion.pdf.

———. 2008. A study of closing costs for FHA mortgages. U.S. Department of Housing and Urban Development, Office of Policy Development and Research, May.

Yavas, A. 1994. Middlemen in bilateral search markets. *Journal of Labor Economics* 12 (3): 406–29.