

The Law, Economics and Psychology of Subprime Mortgage Contracts

Oren Bar-Gill*

Introduction

Approximately 5.2 million subprime loans were originated in 2006, bringing the total value of outstanding subprime loans above \$1 trillion.¹ A few months later the subprime crisis began, with soaring foreclosure rates and hundreds of billions, perhaps trillions, of dollars in losses to borrowers, lenders, neighborhoods and cities, not to mention broader effects on the US and world economy.² I do not purport to explain the subprime crisis or to prescribe a policy that would prevent such a crisis from ever happening again. Rather I focus on the subprime mortgage contract. I identify the central contractual design features in subprime mortgage contracts. I argue that for many borrowers these contractual design features were not welfare maximizing. To the extent that the identified contractual design features contributed to the subprime crisis, the welfare loss to borrowers, substantial in itself, is compounded by much broader social costs. Finally, I argue that a better understanding of the market failure that produced these inefficient contracts should inform the ongoing efforts to reform the regulations governing the subprime market.

During the five years preceding the crisis, the subprime market experienced staggering growth as riskier loans were made to riskier borrowers.³ Not surprisingly these riskier loans came at a higher price. Higher interest rates compensated lenders for the increased risk that they undertook.⁴ High prices are not a problem (or, at least, not the problem that this article addresses). The problem is that the high price was hidden or underappreciated by borrowers. The loan contracts, in the expanding subprime market, contained innovations far beyond an increase in the interest rate. In comparison to the prime market that for years was dominated by the traditional, standardized 30-year FRM, the subprime

* Associate Professor of Law, NYU School of Law. I wish to thank Lily Batchelder, Lucian Bebchuk, Vicki Been, Clay Gillette, Solomon Greene, Lewis Kornhauser, Alan Schwartz, and Elizabeth Warren for helpful comments and discussions.

¹ See Yuliya Demyanyk and Otto Van Hemert, *Understanding the Subprime Mortgage Crisis*, NYU Stern, Working Paper, pp. 5-6 (October 9, 2007) (extrapolating from the LP data, which covers – “85% of all securitized subprime mortgages [subprime defined by the securitization classification], which in turn make up about 60% of the total subprime mortgage market.”) Compare to figures cited by The Center for Responsible Lending at <http://www.responsiblelending.org/issues/mortgage/>.

² CBO, *The Budget and Economic Outlook: Fiscal Years 2009 to 2018*, p. 23, January 23, 2008 (available at <http://www.cbo.gov/>) (citing estimates of between \$200 billion and \$500 billion for total subprime-related losses and noting the additional, and potentially substantial, indirect adverse effects of the subprime crisis on the economy). CITE: FRB data, Paulson speech, The Center for Responsible Lending data at <http://www.responsiblelending.org/issues/mortgage/>.

³ See Demyanyk and Van Hemert, *supra*, at 5-6; The Center for Responsible Lending at <http://www.responsiblelending.org/issues/mortgage/>.

⁴ Lauren E. Willis, *Decisionmaking and the Limits of Disclosure: The Problem of Predatory Lending: Price*, 65 Maryland L. Rev. 707, 720-721 (2006) (describing the development of risk-based pricing in the mortgage market).

market boasts a broad variety of complex loans with multidimensional pricing structures. Hybrid loans, combining fixed and variable rates, interest-only loans, and option-payment ARMs, each product type with its own multidimensional design, were the mortgages of choice in the expanding subprime market.

These subprime mortgage contracts share two problematic design features. First is the level of complexity itself. Subprime loan contracts can feature more than fifteen different prices, some applicable at different time-periods during the loan term, some contingent on various exogenous changes or borrower behavior. Imperfectly rational borrowers are unable to fully understand the costs associated with these complex contracts. And when a borrower does not fully understand the implications of the signed contract, it is no longer clear that the contract is welfare-maximizing. The complexity and multidimensionality of subprime contracts impose another cost: They reduce the level of competition in the subprime market. When the different loan options that a borrower faces are so different on so many different dimensions, comparison shopping, a central engine of competition, loses much of its efficacy.⁵

The second problematic feature of subprime mortgage contracts is the deferral of costs into the future. (Of course, any loan contract involves deferred-costs; I am referring to deferral of costs beyond that which is necessarily implied by the very nature of a loan.) The traditional, prime mortgage required a 20 percent downpayment, which implies a loan-to-value (LTV) ratio of no more than 80 percent. In the subprime market the average downpayment was 6 percent, implying an LTV of 94 percent, and many borrowers, 40 percent of borrowers by one count, made no downpayment whatsoever. The schedule of payments on the loan itself exhibits the same deferred-cost characteristic. The majority of subprime loans set a low interest rate for an introductory period, commonly 2 years, and a higher interest rate for the remaining term of the loan. This escalating-payments feature was especially pronounced in interest-only loans and payment-option ARMs that allowed for zero or negative amortization during the introductory period. Why or when are deferred-cost contracts problematic? They are problematic when myopic or optimistic borrowers focus on short-term costs and underestimate long-term costs. These biases cause borrowers to underestimate the total

⁵ CBO has recently suggested that “[t]he rise in defaults of subprime mortgages may also reflect the fact that some borrowers lacked a complete understanding of the complex terms of their mortgages and assumed mortgages that they would have trouble repaying. (Certain ARMs may have been among the more difficult mortgages for first-time borrowers to understand.)” CBO, *The Current Economic Situation*, Testimony of Director Peter R. Orszag before the Committee on the Budget, U.S. House of Representatives, December 5, 2007 (available at <http://www.cbo.gov/ftpdocs/88xx/doc8876/12-5-Economic.htm>). See also FRB, 12 CFR Part 226, Truth in Lending, Proposed Rule, Federal Register, Vol. 73, No. 6, p. 1672, 1675-76, January 9, 2008 (“products in the subprime market tend to be complex, both relative to the prime market and in absolute terms”); GAO, *Alternative Mortgage Products: Impact on Defaults Remains Unclear, but Disclosure of Risks to Borrowers Could Be Improved*, GAO-06-1021 [Abstract] (Washington, D.C.: Sept. 19, 2006) (“Regulators and others are concerned that borrowers may not be well-informed about the risks of AMPs, due to their **complexity** and because promotional materials by some lenders and brokers do not provide balanced information on AMPs benefits and risks.”)

cost of a deferred-cost contract. And when cost is underestimated demand will be artificially and inefficiently high.⁶

I argue that the design of subprime mortgage contracts can be explained as a rational market response to the imperfect rationality of borrowers. If borrowers cannot process complex, multidimensional contracts and thus ignore less-salient price dimensions, then lenders will offer complex, multidimensional contracts, shifting much of the loan's cost to the less-salient price dimensions. If myopic or optimistic borrowers underestimate the future cost of a deferred-cost contract, perhaps because they falsely believe that they will be able to refinance their loan before it resets to a higher interest rate, then lenders will offer contracts with low short-term prices and high long-term prices.⁷

While focusing on only one part of the subprime picture – the design of subprime loan contracts – this Article develops an alternative account of the dynamic in the subprime market – the dynamic that led to the subprime crisis. One common account focuses on the bad lenders, who pushed risky credit onto borrowers who were incapable of repaying.⁸ Another common account focuses on the irresponsible borrowers who took-out loans they could not repay. Both accounts capture some of what was going on during the subprime boom. But both accounts are incomplete. In many cases borrowers were not reckless; they were imperfectly rationale. And in many cases lenders were not evil; they were simply responding to a demand for financing that was driven by borrowers' imperfect rationality.⁹

⁶ CBO has recently suggested that “[c]ertain ARMs may have been among the more difficult mortgages for first-time borrowers to understand. Many of those mortgages made in recent years included teaser rates, which may have confused some borrowers about the eventual size of their mortgage payments when their mortgage rates were reset. Most of those mortgages also included prepayment penalties.” CBO Testimony, *supra*.

⁷ Compare: Ben S. Bernanke, *Financial Markets, the Economic Outlook, and Monetary Policy*, Speech, January 10, 2008 (available at <http://www.federalreserve.gov/newsevents/speech/bernanke20080110a.htm>) (suggesting that the ARM design responds to optimism about house prices – “the more fundamental reason for the sharp deterioration in credit quality was the flawed premise on which much subprime ARM lending was based: that house prices would continue to rise rapidly.”)

⁸ Why would lenders make loans to borrowers who cannot repay? Securitization, and imperfections in the securitization market, provides one answer. The housing bubble and the anticipation of repayment through sale or refinancing provide another answer.

⁹ FRB Chairman, Ben Bernanke, similarly argues that the two common accounts are incomplete. According to Bernanke, the fundamental reason for the subprime crisis was the flawed premise that house prices will continue to rise rapidly. Bernanke also recognizes the relationship between optimism about house prices and contractual design. See Bernanke Speech, *supra* (“Although poor underwriting and, in some cases, fraud and abusive practices contributed to the high rates of delinquency that we are now seeing in the subprime ARM market, the more fundamental reason for the sharp deterioration in credit quality was the flawed premise on which much subprime ARM lending was based: that house prices would continue to rise rapidly. When house prices were increasing at double-digit rates, subprime ARM borrowers were able to build equity in their homes during the period in which they paid a (relatively) low introductory (or “teaser”) rate on their mortgages. Once sufficient equity had been accumulated, borrowers were often able to refinance, avoiding the increased payments associated with the reset in the rate on the original mortgages. However, when declining affordability finally began to take its toll on the demand for homes and thus on house prices, borrowers could no longer rely on home-price appreciation to build equity; they were accordingly unable to refinance and found themselves locked into their subprime ARM contracts. Many of these borrowers found it difficult to make payments at even the introductory rate, much less at the higher post-adjustment rate. The result, as I have already noted, has been rising delinquencies and

While I argue that my behavioral economics theory explains common design features in subprime contracts, I do not argue for the exclusivity of this explanation. In particular, for some borrowers and some loan contracts the very same design features can be explained within a rational choice framework. For instance, the FRB advises that borrowers anticipating a substantial increase in their income within the next few years, e.g., students and trainees, may benefit from a deferred-cost loan (even one with zero of negative amortization). It may well be rational for such borrowers to choose deferred-cost loans. This rational choice theory, however, can explain only a fraction of the deferred-cost loans originated during the subprime expansion. A different rational choice account relies not on an increased capacity to repay but rather on the ability to avoid the high future payments under a deferred-cost loan. According to this account, if real-estate prices increase, the borrower will be able to sell or refinance before the interest rate resets to the higher level. And if real-estate prices drop, the borrower will avoid the higher payments by defaulting on the loan. This strategy may indeed be rational for some borrowers (for exactly how many borrowers is less clear; it would depend on the expected trajectory of real-estate prices, on the cost of default, etc'), but it seems far less rational for lenders.¹⁰ Moreover, data showing that many borrowers were unable to avoid the increased rates suggest that the explanatory power of this rational choice theory is limited.

Another theory follows directly from the continuing increases in home prices (well, at least until they stopped increasing). The argument is that with rising home-prices it was rational to adjust the design of loan contracts to facilitate more home purchases (plus rising prices made homes unaffordable to many borrowers under traditional contractual designs).¹¹ Accordingly, low (or no) downpayment loans were needed to attract borrowers with limited assets. And contracts with low initial monthly payments were needed to attract borrowers with limited monthly incomes.¹² I am not arguing against

foreclosures, which will have adverse effects for communities and the broader economy as well as for the borrowers themselves.”)

It is not clear how competitive the subprime market is. To the extent that competitive forces are at play, the question is why have these forces produced the observed contractual designs? And to the extent that market power is being exercised in this market the question is why have the powerful players chosen the observed contractual designs? Neither competition nor monopoly will produce welfare-reducing contractual designs in the absence of imperfect information or imperfect rationality. (A monopolist would be expected to raise the price; not to distort contractual design.) The proposed behavioral economics theory answers these questions.

¹⁰ Prepayment penalties make this story more plausible, but they raise another question: why do we see more contracts with low teaser rates and substantial prepayment penalties and fewer contracts with higher initial rates and no prepayment penalties? The behavioral economics theory could answer this question.

¹¹ See Credit Suisse Report, *Mortgage Liquidity du Jour: Underestimated No More*, p. 29 (March 12, 2007) (“We have long been of the opinion that the current housing downturn is as much a function of deteriorating affordability as an issue of over supply from fleeing investors and aggressive homebuilders (See our July 2004 report titled “It’s All About the Monthly Payment”). In order to mitigate the record price increases seen throughout the majority of the country in the first half of this decade, homebuyers became increasingly dependant on exotic mortgage products intended to reduce down payments and monthly payments.”)

¹² MBA, *The Residential Mortgage Market and Its Economic Context in 2007*, p. 23 (2007) (“IOs in particular allowed borrowers to afford homes in a booming market.”)

this story. But I am arguing that this story cannot fully explain the observed contractual designs. This account fails to explain why borrowers were willing to sign loan contracts with high future costs. It is here that a behavioral economic theory is needed. The deferred-cost contracts not only allowed more borrowers to qualify for a loan, they also induced borrowers to sign high-cost loans by backloading much of the cost onto less-salient, underestimated price dimensions. Put differently, increasing real-estate prices explain both the motivation for designing contracts that would qualify more borrowers and the perception that these contractual designs are costless (as the long-term costs can be avoided via sale or refinancing). The question is whether real-estate prices could rationally have been expected to continue rising fast enough to validate the low-cost perception. Was the recent housing bubble a rational bubble? I argue below that while there were surely some rational market participants riding the housing bubble, there were also many imperfectly rational participants who held optimistic beliefs about the size and duration of the bubble.

The proposed behavioral economics theory offers a more complete account of the dynamics in the subprime market and of how these dynamics shaped the design of subprime loan contracts. The proposed theory can also be used to evaluate the many proposed regulatory solutions to the subprime problem and to devise some potentially superior solutions. In particular, I argue that the FRB's, recently proposed amendments to the disclosure regime established under TILA and HOEPA,¹³ while clearly a step in the right direction, do not go far enough. A main problem of the current disclosure regime – and a problem not addressed in the FRB's proposed amendments – is that this regime completely overlooks the possibility of prepayment, and this omission substantially weakens the key TILA disclosure, the APR.

The most important innovation of the TILA was the introduction of the APR, a normalized total cost of credit measure that was designed to assist borrowers in comparing among different loan products. In theory, the APR should solve, or at least mitigate, both the complexity problem and the cost-deferral problem. Complexity and multidimensionality pose a problem if they hide the true cost of the loan. The APR responds to this concern by folding the multiple price dimensions into a single measure.¹⁴ The APR should similarly help short-sighted borrowers grasp the full cost of deferred-cost loan contracts, since the APR calculation assigns proper weight to the long-term price dimensions. The APR can solve these problems, but only if borrowers rely on the APR in choosing among different loan products. Yet many borrowers no longer rely on the APR.

Borrowers stopped relying on the APR because it ignores the possibility of prepayment, and by doing so substantially distorts the total value of the loan. This distortion was especially large during the recent subprime expansion, when for many loans the prepayment option constituted a substantial value-component. When a borrower expects to prepay a deferred-cost loan by the end of the low-rate introductory period, it makes little sense for this borrower to rely on an APR that presumes continued payments at the

¹³ CITE (from <http://www.federalreserve.gov/newsevents/press/bcreg/20071218a.htm>)

¹⁴ The APR incorporates many but not all price dimensions. See *infra*.

high post-introductory rate. Instead, this borrower might focus on the short-term price component. As the APR lost the trust of borrowers, it also lost the ability to effectively address the complexity and cost-deferral problems.

I propose a new disclosure designed to refocus borrower attention on the APR by emphasizing the limits of the prepayment option. Specifically, the proposed disclosure would convey that the probability of securing a refinance loan that would allow the borrower to avoid payment shock is substantially lower than 100 percent. In fact, I envision (and specify below) a disclosure that would provide an estimate of this probability based on the specific loan terms and projections of house price and interest rate trajectories. This proposal invokes the limits of the prepayment option to convince borrowers that the APR is the most important cost measure. A related proposal would redefine the APR by incorporating the prepayment option into the APR measure. If borrowers ignored the traditional APR figure because it ignored the prepayment option, perhaps they will embrace the proposed APR that incorporates the prepayment option.

Both proposals require calculations that would be based on projections of house price and interest rate trajectories. These projections would necessarily be based on a series of assumptions. While the use of assumptions is not new to disclosure regulation, I recognized that some degree of arbitrariness in the choice of assumptions is inevitable and that the chosen assumptions will not perfectly reflect the situation of many borrowers. These shortcomings, however, should be weighed against the benefit of restoring the APR to its rightful position at the forefront of the mortgage disclosure regime.

The Article proceeds as follows. Part I provides some background on the subprime mortgage market. Part II describes the central design features of subprime mortgage contracts. Part III develops the behavioral economics theory that explains the identified contractual design features. Part IV discusses competing rational choice explanations. Part V describes the welfare costs of the identified contractual design features. Part VI asks how the mistakes at the heart of this market failure endured for so long despite the work of several mistake-correction forces. Part VII considers policy implications.

I. The Subprime Mortgage Market

The subprime mortgage market has grown from about 2 percent of mortgages in 1998 to nearly 14 percent in mid-2007.¹⁵ “Of the approximately 50 million outstanding mortgages in the U.S. today, approximately 10 million are subprime loans.”¹⁶ In 2006, at the peak of the subprime lending spree, over 20 percent of mortgage originations were

¹⁵ See Remarks by Secretary Henry M. Paulson, Jr. on Current Housing and Mortgage Market Developments Georgetown University Law Center, October 16, 2007 (available at <http://www.treasury.gov/press/releases/hp612.htm>).

¹⁶ See Paulson Remarks, *supra*.

subprime, bringing the total value of outstanding subprime loans above \$1 trillion.¹⁷ To put things in perspective, the US mortgage market can be divided into the following six segments: prime conforming, prime-jumbo (loan exceeding the maximum size that Freddie Mac and Fannie Mae are willing to buy: \$417,000 in 2006 and 2007), Alt-A, subprime, government (FHA and VA), and second-priority home-equity loans. In 2006, mortgage originations were divided among these five segments as follows: prime-conforming – 33.2%, prime-jumbo – 16.1%, Alt-A – 13.4%, subprime – 20.1%, government (FHA and VA) – 2.7%, and home-equity loans – 14.4%.¹⁸ While this article focuses on the subprime segment of the mortgage market, the less-risky Alt-A segment will also be considered, as it exhibits many of the same contractual design features that were prevalent in the subprime segment.

A. Defining Subprime

This Article focuses on the subprime mortgage market, where the identified contractual design features – specifically heightened complexity and deferred costs – are most commonly observed. What is a subprime mortgage? In theory, subprime loans are sold to riskier borrowers.¹⁹ While low-risk borrowers get low-price, specifically, low interest rate prime loans, high-risk borrowers get high-price, specifically, high interest rate subprime loans. This description suggests that the prime vs. subprime dichotomy is misleading. The risk associated with different borrowers varies along a continuum and, accordingly, loan prices vary along a continuum.

Still, it is helpful to focus on a subset of high-risk, high-price loans, even if the line that divides this category of loans from the neighboring, lower-risk, lower price category is both arbitrary and blurry. The mortgage industry itself follows this rough categorization. According to one rough division, borrowers with FICO scores below 620 are considered subprime borrowers.²⁰ Of course, a borrower's FICO score is only one of several factors determining the risk level, e.g., for defining securitization pools. For this purpose, industry participants consider several other factors beyond the FICO score. One important factor is the size of the loan relative to the value of the home, as captured by the loan-to-value ratio.²¹ Policymakers also follow the prime vs. subprime

¹⁷ See Demyanyk and Van Hemert, *supra*, at 5-6. Compare to figures cited by The Center for Responsible Lending at <http://www.responsiblelending.org/issues/mortgage/>.

¹⁸ See MBA, *The 2007 Mortgage Market Statistical Annual*, Vol. 1, p. 4 (2007).

¹⁹ The “in theory” qualifier is used, since many low-risk borrowers end-up with high-price, subprime loans. See *infra*.

²⁰ See, e.g., Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 5 (2007) (“In the United States, a subprime borrower today typically refers to an individual with a FICO score below 620, who has become delinquent on some form of debt repayment in the previous 12 to 24 months, or who has even filed for bankruptcy in the last few years.”); Credit Suisse Report, *supra*, at 13 (quoting the 620 figure).

²¹ *Id.* In 2006, the average FICO score of a borrower on a first lien subprime loan was 654.7. See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1. This data reflects the trend of making subprime loans to high FICO score borrowers who exhibit risk factors other than an impaired credit history, e.g., borrowers who do not wish to produce a downpayment (zero-down borrowers), borrowers who do not wish to fully disclose their income and financial wealth (no-doc and low-doc borrowers), and borrowers seeking a high

categorization. The recent credit crisis is dubbed the subprime mortgage crisis, and legislator and regulators are working to fix the problems in the subprime market.

While it is helpful to focus on the subprime category, the blurry contours of this category pose challenges to researchers studying the subprime market and to policymakers who then rely on this research.²² Researchers have tackled this problem using three different approaches: The traditional approach is to rely on a list, developed by HUD, of lenders whose predominant business is subprime, specifically lenders that originate a large percentage of “high-cost” loans, defined by an initial interest rate that is at least 3 percent above the yield of a treasury bill with a comparable maturity period. Under this approach, a loan originated by a lender on the HUD list is a subprime loan.²³ The obvious shortcoming of this approach is that lenders on the HUD list also make non-subprime loans, some in substantial quantities. Another problem is that the HUD’s definition of subprime is based on high initial interest rates. This definition might exclude high-cost loans that offer low initial teaser rates.²⁴

The second approach uses securitization data and relies on the classification of the security as “subprime” by the secondary mortgage market (aided by rating agencies).²⁵ Researchers at the Federal Reserve Bank of Boston described this approach as follows: “The secondary mortgage market consists of investors who purchase securities that are collateralized by residential mortgages. There are three broad types of securities, and they are referred to as prime, alt-a, and subprime. The three types are primarily distinguished by the credit risk of the underlying mortgages, with prime denoting mortgages with the least amount of risk, subprime denoting mortgages with the most amount of risk, and alt-a denoting mortgages with risk properties somewhere in between. A subprime mortgage

LTV loan. See Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, pp. 6-7 (2007).

²² FRB Proposed Rule, *supra*, at 1683 (“there is no single, precise, and uniform definition of the prime or subprime market, or of a prime or subprime loan. Moreover, the markets are separated by a somewhat loosely defined segment known as the alt-A market, the precise boundaries of which are not clear.”)

²³ See Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 6 (2007) (describing the HUD list approach); Michael LaCour-Little, *Economic Factors Affecting Home Mortgage Disclosure Act Reporting*, Working Paper, p. 4 (2007) (available at <http://ssrn.com/abstract=992815>) (describing the HUD list approach); Paul S. Calem, Jonathan E. Hershaff, and Susan M. Wachter, *Neighborhood Patterns of Subprime Lending: Evidence from Disparate Cities*, 15(3) Housing Policy Debate __ (2004) (All studies conducted prior to the release of the 2004 HMDA data (which for the first time included price information for high-priced loans) used the HUD list to identify subprime lending.) The 2005 HUD list of lenders who specialize in subprime lending comprises of 210 lenders (although not all of these lenders offer loans nationally). See www.huduser.org/datasets/manu.html.

²⁴ A third problem stems from the comparison to a treasury bill with a comparable maturity. The problem is that the nominal loan period, commonly 30 years, is often much longer than the actual loan period. See *infra* __ (discussing a similar problem with the HMDA data approach).

²⁵ See, e.g., Demyanyk and Van Hemert, *supra*.

in this context refers to a loan placed in a pool of securitized mortgages that is labeled “subprime.”²⁶

The third approach is based on HMDA data. HMDA requires lenders to disclose certain information about “higher-priced loans,” defined as loans with an APR three points (or more) above the Treasury rate for a security of the same maturity.²⁷ The FRB has recently adopted this definition in its proposed TILA amendments.²⁸ This approach equates subprime loans with HMDA’s higher-priced loans.²⁹ There are several problems with this approach: The first problem concerns the definition of the relevant APR. The APR that is compared to the Treasury rate (for a security of the same maturity) is the APR as defined under TILA and Regulation Z. But the Reg Z definition has several shortcomings: This APR include some, but not all, points and fees.³⁰

Another problem stems from the large disparity between the nominal loan duration, on which the HMDA Treasury rate benchmark is based, and the actual loan duration, which serves as the basis for loan pricing and determines the APR that is then compared to the Treasury rate benchmark. Actual loan duration is generally much shorter than the nominal duration, which is commonly 30 years, and the divergence is especially large for subprime loans. Given their short expected duration, the pricing of many subprime loans is based on the 5-year or 2-year Treasury rate, which can be much lower than the 30-year Treasury rate. So a high priced loan, with a price substantially above the relevant 2-year rate, will not be reported, because it is not 3 points above the 30-year rate.³¹ The magnitude of this distortion depends on the slope of the yield curve. Specifically, a flatter yield curve implies a smaller difference between the 30-year rate and the (lower) 10-year, 5-year and 2-year rates that correspond to actual loan durations and thus to loan pricing. And a smaller difference increases the number of loans that are 3 points above the 30-year rate.³² The substantial increase in HMDA reportable loans over the 2004-06

²⁶ Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, pp. 6-7 (2007)

²⁷ See 12 C.F.R. Pt. 203, App. A (Regulation C) requires public disclosure of the APR, when the APR, as disclosed to the consumer under Regulation Z, 12 C.F.R. 226.6, 226.18, exceeds the applicable Treasury rate by three or more points for first-lien loans or five or more points for subordinate lien loans. The FRB’s recently proposed amendments to Regulation Z adopt a similar/identical definition.

²⁸ FRB Proposed Rule, *supra*, at 1680 (“The definition of “higher-priced mortgage loans” would appear in proposed §226.35(a). Such loans would be subject to the restrictions and requirements in § 226.35(b) concerning repayment ability, income verification, prepayment penalties, escrows, and evasion, except that subordinate-lien higher-priced mortgage loans would not be subject to the escrow requirement.”)

²⁹ See Michael LaCour-Little, *Economic Factors Affecting Home Mortgage Disclosure Act Reporting*, Working Paper, p. 3 (2007) (available at <http://ssrn.com/abstract=992815>).

³⁰ See *infra*.

³¹ See Michael LaCour-Little, *Economic Factors Affecting Home Mortgage Disclosure Act Reporting*, Working Paper, p. 9 (2007) (available at <http://ssrn.com/abstract=992815>)

³² See Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner, *Opportunities and Issues in Using HMDA Data*, 29 *Journal of Real Estate Research* 351, 367-68 (2007) (“The yield curve displays how the yield on financial instruments, such as U.S. Treasury securities, varies with maturity and, therefore, reflects the relationship between short- and long-term interest rates. The yield curve is typically upward sloping; that is, short-term rates are typically lower than long-term rates. Sometimes, however, the yield curve is relatively flat; that is, short-term rates are close to long-term rates. Occasionally, the yield curve inverts, and short-term rates rise above long-term rates. Changes in the shape of the yield curve affect the reporting

period can be explained, at least in part, by the flattening of the yield curve over the same period.³³ Recognizing this problem, the FRB, in its recently proposed TILA amendments, adopted rules that compare the loan's APR to the yield on Treasury securities with maturities well below the nominal 30-year term.³⁴

B. Subprime Mortgage Loans: The Numbers

The subprime mortgage market has increased substantially over the past few years (an increase ending in 2007). In 2006, approximately 5.2 million first lien subprime loans were originated, representing 28 percent of total loan volume.³⁵ According to the CBO, “[b]y the end of 2006, the outstanding value of subprime mortgages totaled more than \$1

of higher-priced loans under HMDA. Because most mortgages prepay in a relatively short period (well before the stated term of the loan is reached), lenders use relatively short-term interest rates to set mortgage rates. But for most loans. Regulation C requires lenders to use longer-term rates to determine whether to report a loan as higher priced because the stated maturity of most loans, particularly first lien loans, exceeds twenty years. Thus, a change from one year to the next in the relationship between short- and long-term rates can cause a change in the proportion of loans that are reported as higher priced, all other things being equal. For example, if short-term rates rise relative to long-term rates, then the number and proportion of loans reported as higher priced will increase even if all other factors that may influence the number and proportion of higher-priced loans, such as the business practices of lenders and the credit-risk profiles and borrowing practices of borrowers, remain constant. Conversely, if short-term rates fall relative to long-term rates, then the number and proportion of loans reported as higher priced will fall even if all other possibly influential factors remain constant.”)

Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner, *Opportunities and Issues in Using HMDA Data*, 29 *Journal of Real Estate Research* 351, 370-73 (2007): “Under the Federal Reserve Board's Regulation Z, in calculating the APR for adjustable-rate loans, lenders assume that the interest rate situation at the time of origination will continue for the term of the loan. When the yield curve is steep, it suggests that the market expects short-term interest rates to rise, yet the APR calculation for adjustable-rate loans assumes that interest rates will stay the same. Because of this regulatory construct, when the yield curve is positively sloped, the APRs for adjustable-rate loans tend to be lower than those for fixed-rates loans of similar term and credit risk. Thus, the flattening of the yield curve...narrows the APR gap between adjustable- and fixed-rate loans because, as short-term interest rates increase, it reduces the differences in APRs between fixed- and adjustable-rate loans.”

³³ See Chau Do and Irina Paley, *Explaining the Growth of Higher-Priced Loans in HMDA: A Decomposition Approach*, 29 *Journal of Real Estate Research* __ (2007). See also Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner, *Opportunities and Issues in Using HMDA Data*, 29 *Journal of Real Estate Research* 351, 368-70 (2007) (“A review of the rate spreads between five-year and thirty-year Treasury securities over the past two decades indicates that 2004 (and 2003) were somewhat unusual years by historical standards because the yield curve was particularly steep during this time because of low short-term rates (Exhibit 2). Consequently, the gap between longer- and shorter-term rates was particularly large.”)

³⁴ FRB Proposed Rule, *supra*, at 1685.

³⁵ See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1 (The authors' data includes 2,646,000 loans. Dividing by 0.85 * 0.6 yields the 5.2 million estimate.); CBO Testimony, *supra* (“The share of subprime mortgages, which are extended to borrowers who have low credit scores, rose rapidly after 2002, constituting 21 percent of all home mortgage originations (in dollar terms) in 2005 and 2006.”); Center for Responsible Lending, *A Snapshot of the Subprime Market* (available at <http://www.responsiblelending.org/issues/mortgage/quick-references/a-snapshot-of-the-subprime.html>) (subprime originations accounted for 28% of total loan volume in 2006). Focusing on purchase loans, subprime originations have grown to approximately 20% of the total in 2006. See Credit Suisse Report, *supra*, at 4.

trillion and accounted for about 13 percent of all home mortgages.”³⁶ The average size of a subprime loan has also increased. In 2006, the average size of a first lien subprime loan was \$259,000.³⁷ The size of the loan relative to the value of the property has also increased, with the popularization of second-lien, piggyback mortgages. In 2006, the average combined LTV (including piggyback mortgages) on subprime purchase loans was 94%.³⁸

In terms of loan purpose, in 2006, 45.4 percent of first lien subprime loans were purchase loans, and 54.6 percent were refinance loans.³⁹ The importance of this distinction is highlighted by the finding that the average number of mortgages per-borrower, per-property is close to three.⁴⁰ In terms of loan type, in 2006, approximately 75 percent of loans were ARMs (or Hybrids) and the remaining 25 percent were FRMs.⁴¹ The average subprime borrower had a debt-to-income ratio of approximately 40 percent and a FICO scores of 654.7.⁴²

While the focus of this Article is on the subprime market, the Alt-A market should also be mentioned. This market, which includes medium risk loans – between subprime and prime – is of interest because it exhibited the same contractual designs that were prevalent in the subprime market. The Alt-A market has grown from 2 percent of total originations in 2003 to 13 percent of originations in 2006.⁴³ Nontraditional mortgage products allowing borrowers to defer principal, or both principal and interest, reaching 78 percent of alt-A originations in 2006.⁴⁴

³⁶ CBO Testimony, *supra*.

³⁷ See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1. [This source contains comparisons with previous years]

³⁸ See Credit Suisse Report, *supra*, at 4, 26 (based on non-agency MBS data). See also Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 44, Table 2 (2007) (using the HUD list definition of subprime and Massachusetts data, Gerardi et al. find that the average LTV of an initial-purchase subprime loan rose from 0.76 in 1988 to 0.84 in 2007, and that the median LTV rose from 0.80 in 1988 to 0.90 in 2007.)

³⁹ See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1. Of the 54.6 percent of refinance loans, 44.8 percent were refinance/cash-out loans, and 9.8 were refinance/no-cash-out loans. *Id.* See also MBA, *The Residential Mortgage Market and Its Economic Context in 2007*, p. 24 (2007); LaCour-Little, *supra*, at 17 (a little more than half of the loans in 2004-05 were refinancing loans). See also Chang Yah and Frank E. Nothaft, *Demystifying the Refi-Share Mystery*, 29 *Journal of Real Estate Research* 511 (2007).

⁴⁰ See Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, pp. 4-5, 14 (2007) (Gerardi et al emphasize the importance of distinguishing subprime loans made for initial purchase from subprime refinances of existing mortgages; they find that “the average number of mortgages over the life of completed homeownerships is 2.7.”) Gerardi et al. use the HUD list definition of subprime. *Id.* at 7.

⁴¹ See Credit Suisse Report, *supra*, at 28.

⁴² See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1.

⁴³ FRB Proposed Rule, *supra*, at 1684.

⁴⁴ FRB Proposed Rule, *supra*, at 1684.

C. Market Structure

1. Participants

Traditionally a single entity, commonly the neighborhood bank, was the only party, other than the borrower, in the mortgage transaction. This bank would originate the loan, provide the funds for the loan, and service the loan. In the modern mortgage market the different roles – origination, financing and servicing – are often performed by different entities.⁴⁵

Mortgages are originated mainly by depository institutions, i.e., banks, or by subsidiaries or affiliates of banks, and by mortgage companies,⁴⁶ with the bulk of loan volume originated by mortgage companies.⁴⁷ Another important group of participants in the mortgage origination process are the brokers: “Mortgage brokers act as intermediaries between lenders and borrowers, and for a fee, help connect borrowers with various lenders that may provide a wider selection of mortgage products.”⁴⁸ In 2006, brokerages accounted for 58% (\$1.7 trillion) of total origination activity.⁴⁹ Mortgage originators clearly influence the design of the mortgage contract.

Banks still finance loans, but Wall Street, via securitization, has been playing an increasing role.⁵⁰ In fact, the majority of mortgage loans are securitized.⁵¹ Both banks,

⁴⁵ See Paulson Remarks, *supra* (“A mortgage loan is likely to be originated, serviced, and owned by three different entities. Originators often sell mortgages to securitizers who package them into mortgage-backed securities, which are then divided and sold again to a global network of investors.”)

⁴⁶ GAO AMP Report, *supra* [pp. 2-3] (“Borrowers obtain residential mortgages through either mortgage lenders or brokers. Mortgage lenders can be federally or state-chartered banks or mortgage lending subsidiaries of these banks or of bank holding companies. Independent lenders, which are neither banks nor affiliates of banks, also may fund home loans to borrowers. Mortgage brokers act as intermediaries between lenders and borrowers, and for a fee, help connect borrowers with various lenders that may provide a wider selection of mortgage products.”) Indirect originations also played an important role. See LaCour-Little, *supra*, at 17 (“A little less than one third of all loans were originated through indirect, wholesale channels, which include mortgage brokers, certain correspondent lending relationships, builder programs and the like.”)

⁴⁷ Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner, *Opportunities and Issues in Using HMDA Data*, 29 *Journal of Real Estate Research* 351, 353 (2007) (based on HMDA Reporting – “Depository institutions account for the bulk of the reporting institutions, but mortgage companies report the majority of the applications and loans. In 2005, for example, nearly 80% of the 8,850 reporting institutions were depository institutions but together they reported only 37% of all the lending-related activity. Mortgage companies accounted for 63% of all the reported lending; 70% of these institutions were independent and not related in any way to a depository institution.”)

⁴⁸ GAO AMP Report, *supra* [pp. 2-3]. Brokers also play a more direct role via indirect originations. See LaCour-Little, *supra*, at 17.

⁴⁹ Wholesale Access, *New Broker Research Published*, August 17, 2007 (available at <http://www.wholesaleaccess.com/8-17-07-prs.shtml>). “[T]he average firm produced \$32.4 million (151 loans)...conforming loans accounted for 48% of brokers’ production volume; the most used wholesalers were Countrywide (for conventional loans) and New Century (for subprime loans).” *Id.*

⁵⁰ For a good exposition to securitization – see Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2045-48 (2007).

⁵¹ See Demyanyk and Van Hemert, *supra*, at 5, FN 3 (finding 60% securitization); Credit Suisse Report, *supra*, at 11 (finding 75% securitization).

and especially non-bank originators, will commonly sell their loans to Wall Street investment banks that pool the loans, carve-up the expected cash flows, and convert these cash flows into bonds that are secured by the mortgages.⁵² As a result, the “owners” of the loans are the investors who purchased shares in these Mortgage (or Asset) Backed Securities (MBSs or ABSs). The investment banks and their clients also influence the design of mortgage contracts, as the demand for MBSs and thus the price that the investment banks are willing to pay the originators for the loans depends on the contractual design.

The final role in the mortgage transaction is played by the servicers. Mortgage servicers perform four basic functions: First, they collect mortgage payments from borrowers. And when borrowers fail to make full payments, servicers are responsible for making up the shortfalls. Second, servicers manage escrow accounts and pay property taxes and insurance premiums from those accounts. Third, they manage and temporarily invest funds, track performance of the assets they oversee, and report on performance to loan trustees. Finally, servicers are responsible for loss mitigation – when borrowers fail to make payments or appear likely to fail to make payments, servicers have a variety of mitigation options including forbearance, loan modification, oral repayment plans, short sales, deeds in lieu of foreclosure, and, of course, foreclosure.⁵³ Servicing is performed by loan originators, i.e., banks and mortgage companies, but is increasingly contracted out to specialized servicing companies.⁵⁴ Specialized servicers generate income by contracting for a share of the mortgage payments and from fees charged directly to borrowers.⁵⁵ While servicers clearly play an important role in the mortgage market, they have only limited influence on the contractual design features that this Article focuses on.

While the different roles – origination, financing and servicing – are often played by different entities, these different entities may be linked together through common ownership or contractual arrangement (express or implied). In particular, a single parent company can have several subsidiaries playing different roles. For example, “[a]mong Countrywide’s operations are a bank, overseen by the Office of Thrift Supervision; a broker-dealer that trades United States government securities and sells mortgage-backed securities; a mortgage servicing arm; a real estate closing services company; an insurance company; and three special-purpose vehicles that issue short-term commercial paper backed by Countrywide mortgages.”⁵⁶ As will be explained below, these links between the different chains of the mortgage transaction can prove helpful to the individual chains, or to their common parent.

⁵² See, e.g., Engel and McCoy, 75 *Fordham L. Rev.* 2039, 2045 (2007).

⁵³ Kurt Eggert, *Limiting Abuse and Opportunism by Mortgage Servicers*, 15 *Housing Policy Debate* 753, 755 (2007) (available at SSRN: <http://ssrn.com/abstract=992095>).

⁵⁴ Eggert, *supra*, at 767.

⁵⁵ Eggert, *supra*, at 769.

⁵⁶ See Gretchen Morgenson, *Inside the Countrywide Lending Spree*, *New York Times*, August 26, 2007.

2. Competition

Given the multi-layer structure of the mortgage market, competitiveness is difficult to define. On the one hand, competitiveness in the overall mortgage market is not well-defined. On the other hand, given the connections between the three layers, it can be misleading to separately assess competitiveness at each layer of this market. For present purposes, however, it is sufficient to focus on the loan-origination sub-market, because that is where (most of) the contractual design is determined.⁵⁷ However, in assessing the competitiveness of the loan-origination market, influences from other market segments will be considered.

At first blush, the loan origination market appears to be fairly competitive. In 2006, the top 15 subprime lenders divided among themselves 80.5 percent of the market, with no lender holding more than a 13 percent share.⁵⁸ And the HUD list of lenders who specialize in subprime lending comprises of 210 lenders (although not all of these lenders offer loans nationally).⁵⁹ Barriers to entry in this industry have been substantially reduced with the growth in securitization, which enables entry by new, small lenders.⁶⁰ Moreover, the internet has enhanced competition by reducing shopping costs.⁶¹ The FRB, at least, characterized this market as competitive.⁶²

Nevertheless, many observers have expressed concerns about the level of competition in the subprime market. The notion is that many consumers engage in only limited shopping.⁶³ Moreover, the increasing complexity of mortgage products renders comparison shopping more difficult and limited the efficacy of the limited shopping that

⁵⁷ Of course, contractual design is indirectly affected by the other components of the mortgage market. I will elaborate on these effects below.

⁵⁸ See Credit Suisse Report, *supra*, at 22 (The market shares of the top subprime lenders in 2006 were: Wells Fargo 13.0%, HSBC Finance 8.3%, New Century 8.1%, Countrywide Financial 6.3%, CitiMortgage 5.9%, WMC Mortgage 5.2%, Fremont Investment 5.0%, Ameriquist 4.6%, Option One 4.5%, First Franklin 4.3%, Washington Mutual 4.2%, Residential Funding 3.4%, Aegis Mortgage 2.7%, American General 2.4%, Accredited Lenders 2.3%. In total the top 15 lenders commanded 80.5% of the market.)

⁵⁹ See www.huduser.org/datasets/manu.html (describing the 2005 list). [The much higher number of HMDA reporting institutions – 8,850 in 2005 according to Avery, Brevoort, and Canner, *supra* – is probably driven by many institutions that report very few higher-priced loans. Verify]

⁶⁰ See Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 Fordham L. Rev. 2039, 2041 (2007) (“[S]ecuritization funds small, thinly capitalized lenders and brokers, thus allowing them to enter the subprime market. These originators are more prone to commit loan abuses because they are less heavily regulated, have reduced reputational risk, and operate with low capital, helping to make them judgment-proof.”)

⁶¹ See, e.g., www.lendingtree.com, listing over 250 affiliated lenders (www.lendingtree.com/stm3/lenders/scorecard.asp), although clearly not all of these lenders offer subprime loans and those who do might not offer loans nationally.

⁶² FRB Proposed Rule, *supra*, at 1674 (“Underwriting standards loosened in large parts of the mortgage market in recent years as lenders—particularly nondepository institutions, many of which have since ceased to exist—competed more aggressively for market share.”)

⁶³ See Marsha J. Courchane et al, *Subprime Borrowers: Mortgage Transition and Outcomes*, 29(4) Journal of Real Estate Finance and Economics 365, 371-72 (2004) (finding, based on a survey study, that subprime borrowers search less and are less informed).

does occur.⁶⁴ In fact, limited shopping may be a rational response to the reduced efficacy of shopping. The result is imperfect information and imperfect competition.⁶⁵ HUD's proposed amendments to its RESPA regulations are motivated by the need to enhance competition in the mortgage market. And a couple of recent studies, one by the GAO and the other by the FTC and the DOJ, have expressed concerns about the level of competition in the real estate brokerage industry, which may have a substantial effect on contract design given brokers' influence on borrowers' decisions.⁶⁶

D. Regulatory Scheme

The regulatory authority over mortgage lending is divided between the federal and state levels and among several regulators within the federal level.⁶⁷ Starting at the federal level, the banking agencies – FRB, OCC, OTS, FDIC and NCUA – regulate depository institutions. The Federal Trade Commission Improvements Act of 1980 authorizes the Federal Reserve to identify unfair or deceptive acts or practices by banks and to issue

⁶⁴ See Willis, *supra*, at 726-727. The limits of advertising in the subprime market further increase the cost of comparison shopping. FRB Proposed Rule, *supra*, at 1675-76 (“price information for the subprime market is not widely and readily available to consumers. A consumer searching in the prime market can buy a newspaper or access the Internet and easily find current interest rates from a wide variety of lenders without paying a fee. In contrast, subprime rates, which can vary significantly based on the individual borrower’s risk profile, are not broadly advertised. Advertising in the subprime market focuses on easy approval and low payments. Moreover, a borrower shopping in the subprime market generally cannot obtain a useful rate quote from a particular lender without submitting an application and paying a fee.”)

⁶⁵ See William N. Eskridge, *One Hundred Years of Ineptitude: The Need for Mortgage Rules Consonant with the Economic and Psychological Dynamics of the Home Sale and Loan Transaction*, 70 Va. L. Rev. 1083, 1111 (FN 96), 1112 et seq., 1142-43, 1146-1148 (especially p. 1146, bottom) (1984) (imperfect information, largely driven by limited shopping, has led to monopolistic competition, rather than perfect competition); Willis, *supra*, at 806-809 (2006) (Add description).

⁶⁶ See GAO, Report: Real Estate Brokerage: Factors that May Affect Price Competition (August 2005); FTC and DOJ, Report: Competition in the Real Estate Brokerage Industry (April 2007) (available at <http://www.ftc.gov/opa/2007/05/realestate.shtm>) (There are about 98,000 brokerage firms, which employ around 2.5 million real estate licensees. The majority, 60%, of these firms have fewer than five agents and operate locally, and only about 5% had more than 50 agents. Indeed, competition among brokers is primarily local, and, while on the national level, in 1994, the top ten firms account for only 9.1% of the market share, at the local level top firms often control much larger market shares. For example, in Des Moines Iowa, a single firm accounts for over half of all residential real estate transactions. Pp. 31-32. The primary barrier to entry in the brokerage market is the licensing process (which is more stringent for brokers than it is for agents). p. 33. Competition is, however, limited by cooperative participation in multiple listings services (MLS), which are typically operated by local groups affiliated with the National Association of Realtors. Access to the MLS is limited to members, who will use the database to list homes for sale on behalf of sellers and to search for homes on behalf of buyers. P. 10. While the MLS limits both access and competition it also reduces costs for brokers and customers. Pp. 12-14. Competition is also limited by state law. Ten states ban rebates, which are often a key tool in price competition. P. 49. Several states also have minimum-service laws, which limit the extent to which brokers can compete by offering a range of service packages. P. 53. Lastly, competition is restricted by licensing requirements on for-sale-by-owner websites. P. 62.). See also Eskridge, *supra*, at 1148-49. Competition in the servicing market is also limited. Basically, the lender unilaterally selects the servicer, leaving borrowers with little to no choice in who services their loans. See Eggert, *supra*, at 767. This allows servicers to engage in improper behavior related to foreclosure, fees, force-placed insurance, and use and oversight of escrow funds. See Eggert, *supra*, at 756.

⁶⁷ The history of mortgage lending regulation in the U.S. is ably summarized in Eskridge, *supra*.

regulations to prohibit them.⁶⁸ Moreover, the federal banking agencies can use Section 8 of the Federal Deposit Insurance Act to prevent unfair or deceptive acts or practices under Section 5 of the Federal Trade Commission Act, whether or not there is an FRB regulation defining the particular act or practice as unfair or deceptive.⁶⁹ The FRB promulgates disclosure regulations under TILA. The FRB was also granted broad powers under HOEPA (1994) to prohibit acts or practices in mortgage lending that the board finds to be unfair, deceptive, or designed to evade HOEPA.⁷⁰

Non-depository institutions, i.e., non-banks, including mortgage lenders, brokers, and advertisers fall under the jurisdiction of the FTC. The FTC described its own authority as follows: “The FTC enforces a number of federal laws governing home equity lending, including the Truth in Lending Act (“TILA”) and the Home Ownership and Equity Protection Act (“HOEPA”), which amended TILA to address certain practices for high-cost home equity loans. The Commission also enforces Section 5 of the Federal Trade Commission Act (“FTC Act”), which more generally prohibits unfair and deceptive acts and practices in the marketplace.”⁷¹ HUD also plays a role by implementing and enforcing RESPA (e.g., against servicers).⁷²

At the state level, mini-FTC statutes prohibit unfair and deceptive acts and practices. And mini-HOEPA statutes, as well as specific statutes, ban or restrict specific practices, e.g., prepayment penalties and balloon clauses.⁷³ There is substantial variation in the scope and enforcement of state-level laws.⁷⁴ Some states clearly go further than federal

⁶⁸ 15 U.S.C. §§ 57b-1-b-4 (2000).

⁶⁹ See Guidance on Unfair or Deceptive Acts or Practices, OCC Adv. Ltr. AL 2002-3 (Mar. 22, 2002), available at <http://www.occ.treas.gov/ftp/advisory/2002-3.doc>. See also Julie L. Williams & Michael S. Bylsma, *On the Same Page: Federal Banking Agency Enforcement of the FTC Act to Address Unfair and Deceptive Practices by Banks*, 58 BUS. LAW. 1243, 1244 (2003).

⁷⁰ See FRB Proposed Rule, *supra*, at 1677. See also Willis, *supra*, at 744 et seq; Raphael W. Bostic, Kathleen C. Engel, Patricia A. McCoy, Anthony Pennington-Cross, and Susan M. Wachter, *State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms*, Working Paper, August 7, 2007 (available at <http://ssrn.com/abstract=1005423>) (Describing, in Section 2, the federal Home Ownership Equity Protection Act of 1994 (HOEPA)).]

⁷¹ FTC Comment on FRB notice regarding the “Home Equity Lending Market” (71 Fed. Reg. 26,513 (May 5, 2006)), Sept. 14, 2006.

⁷² See RESPA – Real Estate Settlement Procedures Act (available at http://www.hud.gov/offices/hsg/sfh/res/respa_hm.cfm). See also Eggert, *supra*, at 774 (HUD regulates servicers through enforcement of RESPA; RESPA, however, does not thoroughly address improper fees, foreclosures, or force-placed insurance. However, many states have implemented more stringent regulations.)

⁷³ See Raphael W. Bostic, Kathleen C. Engel, Patricia A. McCoy, Anthony Pennington-Cross, and Susan M. Wachter, *State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms*, Working Paper, August 7, 2007 (available at <http://ssrn.com/abstract=1005423>) (describing, in Section 2, the mini-HOEPA statutes and older anti-predatory lending laws restricting the use of prepayment penalties and balloon clauses).

⁷⁴ See Raphael W. Bostic, Kathleen C. Engel, Patricia A. McCoy, Anthony Pennington-Cross, and Susan M. Wachter, *State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms*, Working Paper, August 7, 2007 (available at <http://ssrn.com/abstract=1005423>); Center for Responsible Lending, CRL State Legislative Scorecard: Predatory Mortgage Lending (available at <http://www.responsiblelending.org/issues/mortgage/statelaws.html>); Ho and Pennington Cross (2005).

regulators in their attempts to protect borrowers,⁷⁵ which has given rise to heated preemption battles, especially with the OCC and other federal banking agencies. State law is being increasingly preempted by federal law.⁷⁶

E. Summary

The subprime mortgage market has experienced significant growth between 2000 and 2007. This growth has been stalled, reversed in fact, since mid-2007, when the subprime crisis erupted. Of course, there are many outstanding subprime loans and a non-trivial number of new loans are being originated. Still, in some sense the proposed analysis is a post-mortem of a declining market.⁷⁷

II. The Subprime Mortgage Contract

The traditional, prime mortgage contract was a fixed-rate, 30-year loan for 80 percent, or less, of the home price (i.e., a downpayment of at least 20 percent was required), offered after the borrower proved his ability to repay with full documentation.⁷⁸ The typical subprime mortgage contract is very different from this traditional benchmark. In this Part I describe the main design innovations in the subprime mortgage contract.⁷⁹

⁷⁵ See Making Credit Safer. See also Eggert, *supra*, at 774 (many states have implemented regulations that are more stringent than the regulations promulgated by HUD under RESPA).

⁷⁶ See Christopher Lewis Peterson, Preemption, Agency Cost Theory, and Predatory Lending by Banking Agents: Are Federal Regulators Biting Off More Than They Can Chew? 56 *American University Law Review* 515 (2007); Julia P. Forester, Still Mortgaging the American Dream: Predatory Lending, Preemption, and Federal-Supported Lenders, 74 *U. Cin. L. Rev.* 1303 (2006). See also Making Credit Safer. Despite the increasing federal preemption on the substantive law dimension, state agencies enforcement the state or federal law on lenders and brokers that fall outside the jurisdiction of the federal banking agencies. See GAO AMP Report, *supra* [pp. 3-4] (“State banking and financial regulators are responsible for overseeing independent lenders and mortgage brokers and generally do so through licensing that mandates certain experience, education, and operations requirements to engage in mortgage activities. States also may examine independent lenders and mortgage brokers to ensure compliance with licensing requirements, review their lending and brokerage functions, and look for unfair or unethical business practices. In the event such practices or consumer complaints occur, regulators and attorneys general may pursue actions that include license suspension or revocation, monetary fines, and lawsuits.”)

⁷⁷ See, e.g., Chairman Ben S. Bernanke, *The Economic Outlook*, Testimony Before the Committee on the Budget, U.S. House of Representatives, January 17, 2008 (available at <http://www.federalreserve.gov/newsevents/testimony/bernanke20080117a.htm>) (noting the “virtual shutdown of the subprime mortgage market”)

⁷⁸ See, e.g., FTC Comments, *supra*, at 5 (describing the traditional mortgage contract). See also Willis, *supra*, at 715-718 (describing the traditional mortgage which dominated the market until the end of the 20th century).

While the traditional, prime mortgage was a fixed-rate loan (or FRM), adjustable-rate, prime mortgages (ARMs) are also common. The choice between an FRM and an ARM should depend on the bond risk premium. See Ralph S.J. Koijen, Otto Van Hemert, and Stijn Vannieuwerburgh, *Mortgage Timing*, NBER Working Paper No. W13361 (2007) (in References/Mortgage) (“[W]hen the risk premium on long-term bonds is high, the expected payments on the FRM are large relative to those on the ARM, making the ARM more attractive.”) And, in fact, “the bulk of the time variation in both aggregate and loan-level mortgage choice can be explained by time variation in the bond risk premium.” *Id.*

⁷⁹ The Secretary of the Treasury stated that in 2005 and 2006 “about one-quarter of mortgage originations were non-traditional ARMs” (referring to “hybrid-ARMs with low teaser rates, interest-only features, low-

A. Deferred Costs

The subprime mortgage contract, like any loan contract, determines a stream of payments from the borrower to the lender. Under the traditional, fixed-rate contract, this stream consists of unchanging monthly payments throughout the life of the loan. Standard adjustable-rate mortgages already move away from this constant payment schedule, but the variation that is introduced is random, based on fluctuations in an exogenous index. In contrast, many subprime contracts are characterized by a systematic backloading of payments, such that initial payments are low and later payments are high. This deferred-cost characteristic is implemented through several design features.⁸⁰

1. Small or No Downpayment

The downpayment is not a component of the loan contract; it is a component of the home-sale contract. And it determines, together with the home-price, the size of the loan. Nevertheless, it is instructive to adopt a broader perspective on the payment stream that home buyers face. This broader perspective is helpful for the following reasons: First, from the buyer's perspective it makes little difference if a payment is made to the seller or to the lender. Second, in many cases a close (formal or informal) relationship between the seller and the lender allows payment-shifting between the seller and the lender.⁸¹ Accordingly, the payment stream that a buyer faces consists of a "time zero" payment, the downpayment, followed by the payment schedule specified in the loan contract.

One way to defer the costs associated with a home purchase is to reduce the downpayment. Indeed, the size of the average downpayment has been declining over the past years. While the traditional mortgage has a LTV ratio of (at least) 80 percent, implying a downpayment of (at least) 20 percent, the average subprime loan has a combined LTV (including piggyback loans) of 94 percent, implying a downpayment of only 6 percent.⁸² In 2005, over 40% of first-time home-buyers did not make any downpayment.⁸³

or no-down payments, and even negative amortization") Secretary Paulson noted that many of these non-traditional ARMs were sold in the subprime market. He further mentioned, in his October 2007 speech, that of the approximately 10 million outstanding subprime loans, 2 million will reset to higher rates in the next 18 months. See Paulson Remarks, *supra*. See also GAO AMP Report, *supra* [Abstract] ("From 2003 through 2005, AMP originations, comprising mostly interest-only and payment-option adjustable-rate mortgages, grew from less than 10 percent of residential mortgage originations to about 30 percent.") [RA: Get more recent numbers on the growth of AMPs and cite them in the text.]

⁸⁰ While the prevalence of deferred-cost contracts has increased in recent years, this contractual design is not new. Eskridge describes such contracts in his 1984 article, See Eskridge, *supra*, at 1154-1162.

⁸¹ See *infra*.

⁸² See Credit Suisse Report, *supra*, at 4, 26 (based on non-agency MBS data). See also Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 44, Table 2 (2007) (using the HUD list definition of subprime and Massachusetts data, Gerardi et al. find that the average LTV of an initial-purchase subprime loan rose from 0.76 in 1988 to 0.84 in 2007, and that the median LTV rose from 0.80 in 1988 to 0.90 in 2007.) Private Mortgage Insurance also plays an important role in generating these high LTVs. "Private Mortgage Insurance (PMI) is required by lenders when a loan is originated and

2. Escalating Payments

Escalating-payments contracts were prevalent in the subprime mortgage market. In 2006, only 26.1 percent of first lien subprime loans were FRMs.⁸⁴ The vast majority of loans were ARMs or, to be precise, Hybrid mortgages with an initial fixed rate period followed by an adjustable rate period. According to the FRB: “Approximately three-fourths of originations in securitized subprime “pools” from 2004 to 2006 were adjustable-rate mortgages (ARMs) [or Hybrids] with two-or three-year “teaser” rates followed by substantial increases in the rate and payment (so-called “2–28” and “3–27” mortgages).”⁸⁵ In 2006, the average initial rate was 7.2 percent, while the average go-to rate was 10.2 percent.⁸⁶

Of the Hybrid loans, the clearest, and most extreme, examples of escalating-payment contracts are the Interest-Only (I/O) mortgages and Payment-Option (or, simply, Option) mortgages.⁸⁷ In 2006, I/O or Option mortgages reached 21 percent of subprime loans,⁸⁸ and 78 percent of Alt-A originations.⁸⁹ Under an I/O mortgage the borrower pays only the interest during the introductory period, generally one to ten years, and begins paying the principal only after the introductory period ends. The most popular I/O mortgages are hybrid loans, in which the introductory interest rate is fixed and the post-introductory interest rate is variable.⁹⁰

The second common escalating-payment contract is the Option ARM. As described by the FTC, “Option ARMs...generally offer borrowers four choices about how much they will pay each month during the loan’s introductory period. Borrowers may pay: (1) a

closed without a 20 percent down payment. This insurance protects the lender from default losses in the event a loan becomes delinquent.” See HUD, PMI Act Information (available at <http://www.hud.gov/offices/hsg/sfh/res/respapmi.cfm>) The insurance premium for the PMI is often financed through a second mortgage further increasing the LTV.

⁸³ FTC Comments, *supra*, at 10, FN 45.

⁸⁴ See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1. See also Anthony Pennington-Cross, and Giang Ho, *The Termination of Subprime Hybrid and Fixed Rate Mortgages*, Federal Reserve Bank of St. Louis Working Paper Series 2006-042A, pp. 8-9 (2006) (finding, based on LoanPerformance Asset Backed Securities loan-level database (i.e., only the securitized portion of the subprime market), that of the loans originated between 1998 and 2005, 33 percent were FRMs and 67 percent were ARMs).

⁸⁵ FRB Proposed Rule, *supra*, at 1674.

⁸⁶ See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1 (Reporting the average initial rate, 7.2 percent, and the average margin, 4.9 percent. The average go-to rate is the sum of the margin and the index. The average value of the most popular index, the 6 month LIBOR, was 5.3 percent in 2006 (<https://www.efanniemae.com/sf/refmaterials/libor/index.jsp>; http://www.mortgage-x.com/general/indexes/fnma_libor_history.asp))

⁸⁷ I/Os are also “option loans” in the sense that the borrower has an option to pay only interest instead of the fully amortized payment.

⁸⁸ Credit Suisse Report, *supra*, at 28, Exhibit 21.

⁸⁹ FRB Proposed Rule, *supra*, at 1674 (citing David Liu & Shumin Li, *Alt-A Credit—The Other Shoe Drops?*, The MarketPulse (First American LoanPerformance, Inc., San Francisco, Cal.), Dec. 2006). The MBA noted that “Interest only (IO) loans, with both adjustable- and fixed-rates, and payment option loans that allow negative amortization, have become a very important part of the [residential mortgage] market.” MBA, *The Residential Mortgage Market and Its Economic Context in 2007*, p. 3 (2007).

⁹⁰ See FTC Comments, *supra*, at 7.

minimum payment amount that is smaller than the amount of interest accruing on the principal; (2) the amount of interest accruing on the loan principal; (3) the amount of principal and interest due to fully amortize the loan on a 15-year payment schedule; or (4) the amount of principal and interest due to fully amortize the loan on a 30-year payment schedule. Option ARMs vary in the length of the introductory periods they offer. Some, especially in the subprime market, have introductory periods of only one year, six months, or even one month. When the loan's introductory term expires, the loan is recast, amortizing to repay principal and the variable interest rate over the remaining term of the loan."⁹¹ Option ARMs were rare in the subprime market, but quite popular in the Alt-A market.⁹²

These escalating-payments contracts result in sharp increases of up to 100% (and, in some cases, even more) in the monthly mortgage payment at the end of the introductory period.⁹³ In late 2007, FRB Chairman, Ben S. Bernanke reported that interest rates have already been reset for some loans, and that an additional 1.8 million subprime mortgages will have their rates reset during 2008.⁹⁴ According to one estimate, resets expected in the coming years could add about \$42 billion to borrowers' annual payments.⁹⁵

Two implications of the escalating-payments design should be emphasized. First, since lenders' qualification standards generally depend on the borrower's ability to make the initial payments, escalating-payments contracts allow more borrowers to qualify for larger mortgage loans.⁹⁶ Second, escalating-payment contracts often imply zero or

⁹¹ FTC Comments, *supra*, at 7.

⁹² Credit Suisse Report, *supra*, at 26 (based on non-agency MBS data: In 2006, Option ARMs comprised approximately 0.5 percent of the subprime market and ___ percent of the Alt-A market). [RA: See if we can get 2007 numbers].

⁹³ FTC Comments, *supra*, at 8-9; GAO AMP Report, *supra* [pp. 4-5] (describing an example with a 128 percent increase in the monthly payment at the end of the 5-year payment option period). Under Option ARMs the payment increase might occur before the end of the introductory period. The loan contracts allow for negative amortization but set a maximum allowable negative amortization cap of 110 or 115 percent. When this cap is reached, and this can happen before the end of the introductory period, monthly mortgage payments will increase. See Michael LaCour-Little, "Economic Factors Affecting Home Mortgage Disclosure Act Reporting," Working Paper, p. 8 (2007) (available at <http://ssrn.com/abstract=992815>); FTC Comments, *supra*, at 8-9.

⁹⁴ Ben S. Bernanke, *The Economic Outlook*, Statement before the Joint Economic Committee, U.S. Congress (November 8, 2007). [Cited in CBO Testimony]

⁹⁵ See Christopher L. Cagan, *Mortgage Payment Reset: The Issue and the Impact*, p. 2 (Santa Ana, Calif.: First American CoreLogic, March 19, 2007).

⁹⁶ See GAO AMP Report, *supra* [Abstract] ("Federally and state-regulated banks and independent mortgage lenders and brokers market AMPs [mostly I/O and Payment Option loans], which have been used for years as a financial management tool by wealthy and financially sophisticated borrowers. In recent years, however, AMPs have been marketed as an "affordability" product to allow borrowers to purchase homes they otherwise might not be able to afford with a conventional fixed-rate mortgage.") In fact, mortgage affordability and increasing the group of qualifying borrowers may have been the original motivation for this contractual design. See Eskridge, *supra*, at 1107. See also CBO Testimony, *supra* ("Some subprime lenders also required little or no documentation of borrowers' income and assets and established borrowers' qualification for mortgages on the basis of initially low teaser rates."); Credit Suisse Report, *supra*, at 5 ("According to our contacts, homebuyers were primarily qualified at the introductory teaser rate rather than the fully amortizing rate, which for many buyers was the main reason they were even qualified in the first place."). The FRB addresses this concern in its recently proposed TILA amendments. See FRB Proposed

negative amortization. An I/O mortgage is, by definition, a zero amortization loan during the introductory period. Option ARMs, which allow below-interest monthly payments, can lead to negative amortization during the introductory period. Accordingly, at the end of the introductory period (or even earlier) a borrower might end-up owing more than the value of the home. This might happen even when home prices are steady or rising, but, of course, it is more likely to happen when home prices are falling. Debt levels exceeding home value will prevent borrowers from selling or refinancing.

During the introductory period of an escalating-payments contract the borrower may make only relatively small payments. Accordingly, prepayment before the loan rate resets to its higher long-term level is costly to lenders. Lenders respond by imposing prepayment penalties. These penalties either prevent prepayment or compensate the lender if the borrower prepays despite the penalty.⁹⁷ In 2006, 61.6 percent of first lien subprime loans included a prepayment penalty.⁹⁸ The penalty amount is usually expressed as a percent of outstanding balance, up to 5 percent,⁹⁹ or as a specified number of months of interest payments, commonly 6 months worth of interest payments. Prepayment penalties are generally limited in time, i.e., the prepaying borrower will only pay a penalty if she prepays within a specified period. The prepayment penalty period is commonly 2 or 3 years.¹⁰⁰ For example, a 3 percent penalty on a \$200,000 balance amounts to \$6,000. Prepayment penalties provide an important source of revenue for lenders. For example, Countrywide's revenues from prepayment penalties amounted to \$268 million in 2006.¹⁰¹ And these are only direct revenues, enjoyed when the penalty fails to deter prepayment. The indirect revenues – revenues from delayed prepayment, when the penalty achieves its goal of deterring early prepayment – can be substantial.¹⁰²

Rule, supra, at 1689 (“a pattern or practice of failing to consider a borrower’s repayment ability at the fully-indexed rate would create a presumption of a violation of § 226.34(a)(4) (or § 226.35(b)(1)).”)

⁹⁷ See CBO Testimony, supra (explaining how prepayment penalties “protected lenders from the potential churning of mortgages with very low initial rates”).

⁹⁸ See Demyanyk and Van Hemert, supra, at 5-6, Table 1. Prepayment penalties are most common in Hybrid loans: 70 percent of Hybrids have prepayment penalties, as compared to 40 percent of FRMs with prepayment penalties. See Anthony Pennington-Cross, and Giang Ho, *The Termination of Subprime Hybrid and Fixed Rate Mortgages*, Federal Reserve Bank of St. Louis Working Paper Series 2006-042A, pp. 11-12 (2006).

⁹⁹ Cite state laws from Policy Part. See Michael D. Larson, Mortgage Lenders Want a Commitment – and They're Willing to Pay You for It, Bankrate.com, August 26, 1999 (available at <http://www.bankrate.com/brm/news/mtg/19990826.asp>) (One contractual design specifies a penalty of 3 percent of the outstanding balance for prepayment in the first year, a 2 percent penalty for prepayment in the second year and a 1 percent penalty for prepayment in the third year.)

¹⁰⁰ Michael Lacour-Little, *Call Protection in Mortgage Contracts*, WP, p. 26, November 22, 2005.

¹⁰¹ Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007.

¹⁰² See Eric Stein, *Quantifying the Economic Costs of Predatory Lending*, pp. 7-9 (Coalition for Responsible Lending, 2001) (Estimating prepayment penalty revenues at \$2.3 billion each year).

B. Proliferation of Fees

1. Origination Fees

Before closing a loan contract the lender obtains information about the risk that it is about to undertake. Specifically, the lender performs a credit check, it obtains appraisals, a flood certification, and a tax certification (for information about the borrower's outstanding tax obligations). Lenders charge the borrower separate fees for each of these information acquisition services. For example, LandSafe, Countrywide's closing services subsidiary, charges a \$36 fee for the credit check, a \$36 fee for flood certification, and a \$60 fee the tax certification.¹⁰³ In 2006, Countrywide's appraisal fees revenues totaled \$137 million and its credit report fees revenues totaled \$74 million.¹⁰⁴

Also at closing the lender charges fees for administrative services associated with the loan origination process, such as preparing documents and sending emails, faxes and currier mail. For example, some Countrywide loans included fees of \$45 to ship documents overnight and \$100 to e-mail documents.¹⁰⁵ Other fees are charged for ancillary products, such as private mortgage insurance (PMI).¹⁰⁶ Some subprime lenders charge up to fifteen different origination fees, and these fees can add up to thousands of dollars and up to 20 percent of the loan amount.¹⁰⁷ These fees are often financed into the loan amount and form the basis for additional interest charges.¹⁰⁸

2. Post-Origination Fees

In addition to the multiple fees charged at closing, the loan contract specifies a series of future, contingent fees, including late fees, foreclosure fees, prepayment penalties, and dispute-resolution or arbitration fees.¹⁰⁹ Again, these fees can be substantial. Prepayment penalties and foreclosure fees can amount to thousands of dollars.¹¹⁰ Late fees are typically 5 percent of the late payment.¹¹¹

¹⁰³ Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007. "It's a big business: During the last 12 months, Countrywide did 3.5 million flood certifications, conducted 10.8 million credit checks and 1.3 million appraisals, its filings show." *Id.*

¹⁰⁴ Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007.

¹⁰⁵ Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007.

¹⁰⁶ See Willis, *supra*, at 725. According to one, now dated, estimate financed PMI costs borrowers \$2.1 billion each year. See Eric Stein, *Quantifying the Economic Costs of Predatory Lending*, pp. 5-7 (Coalition for Responsible Lending, 2001).

¹⁰⁷ See Willis, *supra*, at 786.

¹⁰⁸ See Willis, *supra*, at 725. According to one, now dated, estimate exorbitant fees – defined as fees exceeding 5 percent of the loan amount and fees reflecting no tangible benefit to borrowers – costs borrowers \$1.8 billion each year. See Eric Stein, *Quantifying the Economic Costs of Predatory Lending*, p. 7 (Coalition for Responsible Lending, 2001).

¹⁰⁹ See Willis, *supra*, at 725.

¹¹⁰ See *supra* Sec. A.

¹¹¹ Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007 (In 2006, Countrywide's revenues from late charges amounted to \$285 million).

C. Summary

In this Part, I described several contract-design features of the common subprime mortgage.¹¹² The next step, carried out in Part III, is to develop a unified theory that can explain these contractual designs. Before I proceed from description to theory, it is important to emphasize that the average subprime contract is continuing to evolve. Specifically, in response to the subprime crisis and the enhanced regulatory attention that followed in its wake, lenders are redesigning their contracts and eliminating some of the features described in this Part.¹¹³

III. A Behavioral Economics Theory

Why do subprime mortgage contracts feature deferred costs and a proliferation of fees? In this Part, I propose a behavioral economics answer to this question: I argue that borrower mistakes led to underestimation of the costs associated with these contractual designs and thus generated demand for mortgage products featuring these contractual designs. But proposing a behavioral account is the easy part. The challenge, which I take-up in Part IV, is to confront the behavioral account with competing rational choice explanations for the same contractual designs. To anticipate my conclusion, the rational choice theories are not wrong, but their explanatory power is limited. They cannot explain the prevalence of the identified contractual designs. This explanatory gap, I argue, should be filled by a behavioral economics theory, to which I now turn.¹¹⁴

A. The Role of Multidimensionality

Subprime mortgage contracts are complex. This complexity centers on the multidimensional price that borrowers pay. An apple, a desk and a book each has a one-

¹¹² I do not purport to cover all the design features that appear in the wide variety of subprime mortgages. For example, I did not discuss low-doc and no-doc loans. Contrary to the traditional mortgage transaction, many subprime mortgages are based on little to no documentation of income and assets. In 2006, 55.3 percent of first-lien subprime loans were no-doc or low-doc loans. See Demyanyk and Van Hemert, *supra*, at 5-6, Table 1. See also Credit Suisse Report, *supra*, at 4 (“Roughly 50% of all subprime borrowers in the past two years [i.e., 2005-2006] have provided limited documentation regarding their incomes.”) “While many believe that buyers choose to provide limited or no documentation for convenience rather than necessity, a study by the Mortgage Asset Research institute sampling 100 stated income (low/no documentation) loans found that 60% of borrowers had “exaggerated” their income by more than 50%.” See Credit Suisse Report, *supra*, at 5.

¹¹³ See Credit Suisse Report, *supra*, Abstract (“Major lenders such as Countrywide, Option One and Wells Fargo have already announced plans to discontinue certain high CLTV and stated income loan programs.”); Gretchen Morgenson, *Inside the Countrywide Lending Spree*, New York Times, August 26, 2007 (On February 23, 2007 Countrywide stopped offering no-doc loans for more than 95% of a home’s appraised value and on March 16, 2007 it eliminated piggyback loans).

¹¹⁴ For a good early behavioral analysis of mortgage market imperfections – see Eskridge, *supra*, at 1112-1118. [RA: Summarize Eskridge’s behavioral arguments and evidence; see which of these arguments/evidence can be linked to my behavioral arguments and which are unrelated to my arguments. Eskridge also discusses the influence of agents/brokers whose interests are not aligned with the buyer. See Eskridge, *supra*, at 1118-1123. These agents/brokers take advantage of buyers’ imperfect information/rationality.]

dimensional price. The mortgage contract, on the other hand, specifies numerous interest rates and fees. Moreover, the one-dimensional prices of the apple, desk and book are non-contingent and deterministically known at the time of purchase. The different interest rates and fees in a mortgage contract – their magnitude and applicability – are contingent on unknown future events. A rational borrower will navigate this complexity with ease. She will accurately assess the probability of triggering each rate and fee and she will accurately calculate the expected magnitude of each rate and fee. Accordingly, each price dimension will be afforded the appropriate weight in the overall evaluation of the mortgage product.

The imperfectly rational borrower is incapable of such an accurate assessment. Of the multiple price dimensions some, salient dimensions, e.g., the initial monthly payment and the downpayment, will receive more weight than they deserve. Other, less salient price dimensions, e.g., the prepayment penalty and the tax certification fee, will receive less weight than they deserve, perhaps a zero weight.¹¹⁵ The result is a misperception of the costs and benefits associated with the mortgage product. With some price dimensions receiving excessive weight and others receiving insufficient weight, it might seem that these over- and underestimations cancel out, on average, and that the imperfectly rational borrower will be getting it right, more-or-less. But this optimistic view assumes that total price is evenly divided between the overestimated and underestimated price dimensions. Only stupid lenders would divide the total price in such a way. If borrowers systematically overestimate price dimension A and systematically underestimate price dimension B, lenders will reduce price A and raise price B. By doing so, lenders create the appearance of a lower price, without actually lowering the price.¹¹⁶

Thus far the analysis has taken the complexity and multidimensionality of the mortgage contract as exogenous. But, in fact, multidimensionality can be endogenous. The traditional 30-year FRM has fewer price dimensions than an Option ARM, with an option to choose between four payment amounts at the introductory period, with possibly varying lengths of the introductory period, with different formulas for calculating the adjustable rate at the post-introductory period, with different possible durations and magnitudes of prepayment penalties etc'. Similarly, the traditional mortgage incorporated the cost of closing services into the loan's interest rate, such that the borrower faced a single price dimension. The common subprime loan prices each of these services separately, generating a multidimensional price. The proposed theory can be readily extended to allow for endogenous complexity. When borrowers accurately estimate existing price dimensions, lenders have an incentive to further break-down the price and add new price dimensions that borrowers are expected to underestimate.

¹¹⁵ Cf. FRB Proposed Rule, *supra*, at 1675-76.

¹¹⁶ See Oren Bar-Gill, *The Behavioral Economics of Consumer Contracts*, __ Minn. L. Rev. __ (2008). See also Willis, *supra*, at 725-726 (describing how “a lender can creatively manipulate each component of the price of a loan to affect a desired predicted return.”)

B. Deferred Costs

Contracts with deferred-cost features are attractive to borrowers, and thus to lenders, when future costs are underestimated by borrowers.¹¹⁷ There are several reasons to expect systematic underestimation of future costs: Myopia, or shortsightedness, is one such reason.¹¹⁸ Optimism is another. Borrowers might be optimistic about different events that affect the cost of a loan. They might be optimistic about future home prices, about future interest rates and about their future income. They might also optimistically underestimate the probability that an adverse contingency, e.g., job loss, accident, or illness, will bring about financial hardship.¹¹⁹ Moreover, some lenders and brokers invoked and reinforced borrowers' myopia and optimism.¹²⁰

Consider low or no downpayment, i.e., high LTV contracts. Myopic borrowers will place excessive weight on the low downpayment and insufficient weight on the future consequences of high LTV, such as higher interest payments and greater difficulty to refinance. And optimistic borrowers will overestimate their ability to make the higher monthly payments or to avoid them by selling or refinancing their home. Next consider escalating-payments contracts. Myopic borrowers will place excessive weight on the initial low payments and insufficient weight on the future high payments.¹²¹ Optimistic borrowers will overestimate future increases in their income that would enable them to make the high future payments. Optimistic borrowers will also overestimate the likelihood of profitably selling or refinancing their home before the interest rate resets to its long-term high level. In addition, the cost associated with prepayment penalties – the penalty itself or the cost of delayed prepayment – will be underestimated by myopic and optimistic borrowers.

¹¹⁷ CBO has recently suggested that “[t]he rise in defaults of subprime mortgages may also reflect the fact that some borrowers lacked a complete understanding of the complex terms of their mortgages and assumed mortgages that they would have trouble repaying. (Certain ARMs may have been among the more difficult mortgages for first-time borrowers to understand. Many of those mortgages made in recent years included teaser rates, which may have confused some borrowers about the eventual size of their mortgage payments when their mortgage rates were reset. Most of those mortgages also included prepayment penalties.)” CBO Testimony, *supra*.

¹¹⁸ CITE evidence of myopia.

¹¹⁹ CITE evidence of optimism.

¹²⁰ FRB Proposed Rule, *supra*, at 1687 (“In addition, lenders and brokers may sometimes encourage borrowers to be excessively optimistic about their ability to refinance should they be unable to sustain repayment. For example, they sometimes offer reassurances that interest rates will remain low and house prices will increase; borrowers may be swayed by such reassurances because they believe the sources are experts.”)

¹²¹ See Rick Brooks and Ruth Simon, *Housing Debacle Traps Even Very Credit-Worthy*, Wall Street Journal, Dec. 3, 2007 (“During the housing boom, the lower introductory rate on adjustable-rate mortgages made them feel closer in cost to regular loans to many subprime borrowers, but those rates can jump after two or three years. Brokers had extra incentives to sell those loans, which have terms that often are confusing to borrowers.”) The term “payment shock,” used to describe the experience of a borrower who has seen his interest rate reset and his monthly payment increase, implies less-than-perfect understanding of this contractual design feature. The term “payment shock” is used, e.g., by the FRB and the FTC. See [CITE] (FRB); FTC Comments, *supra*, at 9 (FTC).

In theory the APR disclosure under TILA should help ameliorate these problems. The APR is a composite of short-term and long-term interest rates.¹²² If borrowers focused on the APR, as TILA envisioned, they would choose loans based on a measure that captures long-term costs as well as short-term benefits. The problem, however, is that many borrowers do not focus on the APR. As recently noted by the FRB:

“A consumer may focus on loan attributes that have the most obvious and immediate consequence such as loan amount, down payment, initial monthly payment, initial interest rate, and up-front fees (though up-front fees may be more obscure when added to the loan amount, and “discount points” in particular may be difficult for consumers to understand). These consumers, therefore, may not focus on terms that may seem less immediately important to them such as future increases in payment amounts or interest rates, prepayment penalties, and negative amortization.... Consumers who do not fully understand such terms and features, however, are less able to appreciate their risks, which can be significant. For example, the payment may increase sharply and a prepayment penalty may hinder the consumer from refinancing to avoid the payment increase. Thus, consumers may unwittingly accept loans that they will have difficulty repaying.”¹²³

C. Proliferation of Fees

The number of price dimensions is irrelevant when borrowers are perfectly rational. The rational borrower will calculate the appropriately weighted sum of all price components and reach the optimal decision based on this total price. Imperfectly rational borrowers, on the other hand, might be misled by the increased pricing complexity. Limited attention and limited memory might result in the exclusion of certain price dimensions from consideration. And a limited processing ability might prevent borrowers from accurately aggregating the different price components into a single total expected price that would serve as the basis for choosing the optimal loan.¹²⁴

¹²² Official Staff Commentary § 226.17(c)(1)-10.

¹²³ FRB Proposed Rule, *supra*, at 1675-76.

¹²⁴ CBO has recently suggested that “[t]he rise in defaults of subprime mortgages may also reflect the fact that some borrowers lacked a complete understanding of the complex terms of their mortgages and assumed mortgages that they would have trouble repaying. (Certain ARMs may have been among the more difficult mortgages for first-time borrowers to understand. Many of those mortgages made in recent years included teaser rates, which may have confused some borrowers about the eventual size of their mortgage payments when their mortgage rates were reset. Most of those mortgages also included prepayment penalties.)” CBO Testimony, *supra*. For over 5 years HUD has been working on reforming the home buying process, specifically through increased transparency regarding closing costs. See HUD, RESPA Reform (available at <http://www.hud.gov/respareform/>): “Buying a home today is too complicated, confusing and costly. Every year, Americans spend approximately \$55 billion on closing costs they don't fully understand.... The *Real Estate Settlement Procedures Act* was enacted in 1974 to provide consumers advance disclosures of settlement charges and to prohibit illegal kickbacks and excessive fees in the homebuying process. Nevertheless, consumers increasingly complain that when they go through this process, they don't understand the charges and often pay more than they thought they agreed to. In addition, homebuyers are severely limited in shopping for settlement services that could significantly lower their costs.”

The APR disclosure, under TILA, was designed to overcome this problem by providing consumers with a uniform total-cost-of-credit measure. Ideally, the APR, by collecting all the rates and fees and folding them into a single aggregate price, would render irrelevant the described limits on borrowers' cognitive abilities – limited attention, limited memory and limited processing ability. The APR, however, does not provide a perfect fix. First, not all price dimensions are included in the APR.¹²⁵ The result is proliferation of excluded fees, as well as high values being set for these excluded price dimensions.¹²⁶ Second, the APR disclosure often comes too late – at closing or not much before closing¹²⁷ – when borrowers feel locked-in and are less likely to start shopping for a better price.¹²⁸ Third, and most important, for the APR to compensate for borrowers' imperfect rationality, borrowers must rely on the APR. But, as argued above, many borrowers do not rely solely, or even mainly on the APR.¹²⁹

D. Increasing the Complexity of an Already Complicated Product

Mortgages are complicated products. Even the total cost of the simplest FRM is difficult to calculate. It is not difficult to calculate the net present value of a constant stream of payments over a preset period of time. But an FRM does not have a preset period of time. The option to prepay – through sale or refinancing – at any time during the nominal 30-year loan period transforms this total cost calculation into a formidable task.¹³⁰

¹²⁵ RA: List prices, rates and fees that must be included in the APR and those that need not be included in the APR. RESPA also requires disclosure of closing-fees. [RA: Write a paragraph describing the disclosure requirements under RESPA. Compare: Eskridge, *supra*, at 1100-1101 (check if Eskridge's description is still relevant).]

¹²⁶ A similar concern about cost shifting between different price dimensions was noted by the FRB as a potential limitation of its proposed TILA amendments, since the new rules would apply to loans with an APR above a specified threshold. See FRB Proposed Rule, *supra*, at 1684 (“some fees, such as late fees and prepayment penalties, are not included in the APR. Creditors could increase the number or amounts of such fees to maintain a loan's effective price while lowering its APR below the threshold.”) See also Eskridge, *supra*, at 1100-1102, 1130-1132. [RA: Check if Eskridge's description is still relevant] Adding the home price itself to the list of price dimensions reveals a related problem. While the price of the home is surely a salient price dimension, the innumerable differences between homes render price-based comparison shopping difficult. Comparing loan APRs, on the other hand, is straightforward. As a result sellers and lenders have a strong incentive to develop a relationship that would allow them to present buyers-borrowers with a package that contains a lower APR and a higher home price. See Eskridge, *supra*, at 1124-1128, 1135-1144 (see especially end of subsection 1 on p. 1144). See also Eskridge, *supra*, at 1168-1171 (discussing “seller points” – payments from the seller to the lender in exchange for the lender quoting a lower interest rate; of course, in a competitive market, these payments that sellers make are passed-on to buyers through an increase in the price of the home.)

¹²⁷ For purchase loans, but not for refinance loans, TILA requires disclosure of an estimated APR three days after the borrowers submits the loan application. See Willis, *supra*, at 747.

¹²⁸ Specifically, after choosing a lender, economic and psychological transaction costs effectively lock the borrower in and force her to accept the lender's referral to a company (often affiliated with the lender) that provides closing/settlement services. For a description of imperfections in the market for closing/settlement services, in 1984, see Eskridge, *supra*, at 1149-1154. Of course, if borrowers anticipate the lock-in and the resulting high fees, they would demand to be compensated by lower prices at the pre-lock-in stage. With imperfectly rational borrowers, however, such anticipation and compensation will be imperfect.

¹²⁹ See *supra* [Deferred Costs Section].

¹³⁰ The problem of deriving the optimal time for prepayment in itself must be solved numerically with the help of high-powered computers. Recently, Agarwal et al. have shown that the optimal prepayment

(Moreover, in addition to the prepayment option, borrowers have the option to forgo the equity they have accumulated and default on the loan, which further complicates the ex ante value calculation.) Not surprisingly, the theoretical solution to the mortgage valuation problem does not predict actual mortgage prices. The reason: imperfectly rational borrowers consistently fail to make optimal prepayment decisions.¹³¹ Suboptimal prepayment decisions imply that borrowers fail to maximize the value of their mortgage. They do not imply misperception of the reduced value. If at the time of contracting irrational borrowers have rational expectations about their irrational prepayment decisions down the road, then the suboptimally utilized mortgage product will be accurately valued. Of course, such rational expectations cannot be presumed.

These difficulties, which exist even under the traditional FRM, are multiplied under the current menu of subprime mortgage contracts. Some exotic subprime loans are more difficult to value than the traditional FRM. But this is not the crux of the problem. Under the standardized traditional FRM, comparison shopping was fairly easy. Borrowers could readily identify the least-cost loan, based on the APR, even if the exclusion of the prepayment option from the APR calculation caused them to misperceive the value of the loan. Standardization guaranteed that borrowers' mistakes affected all competing lenders equally.

The complexity of the modern subprime mortgage, with its numerous price dimensions, makes effective comparison shopping much more difficult. The APR can no longer serve as an effective focal point for comparison shopping, since the prepayment distortion is no longer identical across the different loan products. Moreover, different contractual designs introduce additional mistakes distortions, further impeding upon an effective comparison between different loan products. If standardization allowed borrowers to bypass the difficult task of valuing mortgage products, the end of standardization reintroduces the valuation problem. And, as explained above, calculating the value of a mortgage loan is a task that most borrowers are not equipped to handle.¹³²

decision can be approximated using an implementable formula. See Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, p. 5 (2007).

¹³¹ See Michael Lacour-Little, *Call Protection in Mortgage Contracts*, WP, p. 14, November 22, 2005: ("A large literature describes the theoretical value of mortgage contracts using this approach (see, for example, Dunn and McConnell (1981), Kau, Keenan, Muller, and Epperson (1992), or Hilliard, Kau, and Slawson (1998)). The difficulty with the theoretical approach, however, is that it does not describe actual prices observed in the mortgage market particularly well due to apparently irrationality on the part of mortgage borrowers, who fail to default to the extent predicted when house prices fall and fail to prepay to the extent predicted when interest rates fall. Moreover, research has demonstrated that borrowers prepay even when the call option is out-of-the-money due to household mobility and other exogenous factors and there is even some indication that borrowers default when the put option is out-of-the-money due to trigger events, though this is a more controversial result."); Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, pp. 3, 4 (2007) ("Anomalous refinancing behavior may be partially due to the complexity of the problem.")

¹³² See Paulson Remarks, *supra* ("Homebuyers today have more choices than ever before in finding a mortgage that best suits their circumstances. Yet, comparing the attractiveness of one mortgage product to another can be difficult. Homebuyer education and effective disclosure are critical to helping borrowers understand the risks of innovative mortgage products."); FTC Comments, *supra*, at 14 ("for loans with more complexity – such as nontraditional mortgages – consumers face further challenges in understanding

IV. Rational Choice Theories

The proposed behavioral theory explains the observed contractual designs. But before we embrace the behavioral explanation, Occam's Razor requires that we explore standard rational choice explanations for these same design features.

A. Deferred Costs

1. Rising and Variable Income

It is perfectly rational for a borrower to prefer a deferred-cost mortgage, if the increasing costs are expected to be matched by increasing income. In this spirit, the FRB advises borrowers that “[d]espite the risks of these loans, an I-O mortgage payment or a payment-option ARM might be right for you if...you have modest current income but are reasonably certain that your income will go up in the future (for example, if you're finishing your degree or training program).”¹³³ But how many borrowers fit this description? Notice that the FRB is not talking about standard, gradual pay raises. Those would not match the significant, sharp cost increase that occurs, e.g., at the end of the 2-year introductory period under the common 2/28 hybrid. The FRB is referring to students and trainees. Indeed, the 2/28 hybrid, and even an Option ARM with negative amortization, may be beneficial for a 2nd year law student who anticipates a sharp increase in income after graduation. These students and trainees are good candidates for escalating payment contracts, yet there are too few of them to explain a significant fraction of the 4 million hybrid loans originated in 2006.¹³⁴

While borrowers with rising incomes are the natural candidates for escalating-payments contracts, borrowers with variable incomes may also find some of these contractual designs beneficial. A borrower with volatile income may rationally prefer a loan contract that allows her to make a small monthly payment in low-income periods.¹³⁵ But the

all significant terms and costs.”); Willis, *supra*, at 726 (Describing the increased complexity of mortgage products, and arguing that borrowers face a “bewildering array” of home loan products.) [RA: Check sources cited in Willis, p. 726]; Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2080 (2007); Block-Lieb and Janger, 84 *Tex. L. Rev.* 1481, 1530, 1539-40 (2006). Since borrowers cannot value the different loan options, they are susceptible to skewed advertising, which selectively emphasizes certain dimensions of the loan contract. See FTC Comments, *supra*, at 3-4 (description of FTC enforcement actions, taken when lenders' and brokers' advertisements and oral sales pitches were inconsistent with the offered contracts). The success of such advertising proves the imperfect information and/or imperfect rationality of borrowers.

¹³³ See FRB, Interest-Only Mortgage Payments and Payment-Option ARMs – Are They for You? (available at http://www.federalreserve.gov/pubs/mortgage_interestonly/#right). See also FTC Comments, *supra*, at 8 (noting the advantage of alternative mortgage products for “upwardly mobile” borrowers).

¹³⁴ The 4 million estimate is based on 5.2 million first-lien subprime loans (see *infra* Part I) multiplied by the 78 percent of hybrid ARMs among subprime loans (see *infra* Part II).

¹³⁵ See FRB, Interest-Only Mortgage Payments and Payment-Option ARMs – Are They for You? (available at http://www.federalreserve.gov/pubs/mortgage_interestonly/#right) (advising borrowers that I/O loans and Option ARMs may be suitable for them if they “have irregular income (such as commissions or seasonal earnings) and want the flexibility of making I-O or option-ARM minimum payments during low-income periods and larger payments during higher-income periods.”) See also FTC Comments, *supra*, at 8 (noting the advantage of alternative mortgage products for borrowers with variable income).

typical loan does not offer the low-payment option for more than two years. Accordingly, the income of the target borrower should be volatile only temporarily and then stabilize. Moreover, a rational borrower with volatile income should have no problem making fixed-magnitude mortgage payments. All she needs to do is save some of her earnings from the high-income periods. As with rising-income borrowers, the number of variable-income borrowers who would benefit from deferred-cost loans seems small relative to the number of loans with these design features. Finally, the high foreclosure rates, especially on homes financed by deferred-cost loans,¹³⁶ provide indirect evidence against the rising-income and variable-income theories.

2. Riding the Bubble

A different rational choice theory that purports to explain the prevalence of deferred-cost mortgage products is based on the possibility of avoiding the increased payments by selling the property or refinancing with another mortgage before the interest rate adjusts upward. The FTC commented that “borrowers who are confident that they will sell or refinance their home for an equal or increased value before the introductory period of the loan expires may benefit from alternative loan options.”¹³⁷ A preliminary question is how can anyone be confident that their home will increase in value? The recent bursting of the real estate bubble provides many examples of such misplaced confidence.¹³⁸

¹³⁶ See, e.g., Paulson Remarks, *supra* (“As I mentioned earlier, mortgage defaults and foreclosures are rising. While the delinquency rate today is near the 2001 rate, there are over seven times more subprime mortgages today than there were in 2001. At the end of the second quarter of this year, more than 900,000 subprime loans were at least 30 days delinquent. Foreclosures are also up significantly – increasing about 50 percent from 2000 to 2006. Foreclosures on subprime loans are up over 200 percent in that same period. Current trends suggest there will be just over 1 million foreclosure starts this year - of which 620,000 are subprime.”) Recall that most of the 620,000 subprime foreclosures that Secretary Paulson anticipates the underlying loan contract was a deferred-cost contract. On the relationship between contractual design and borrower distress – see Gramlich, *supra*, at 66-67 (arguing, based on Schloemer et al. 2006, that mortgage contract design is linked to borrower distress) [RA: Get Schloemer et al. 2006]; Roberto G. Quercia, Michael A. Stegman, and Walter R. Davis, *The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments*, Center for Community Capitalism, Kenan Institute for Private Enterprise, University of North Carolina at Chapel Hill, p. 25 (January 25, 2005) (available at <http://www.ccc.unc.edu/documents/foreclosurepaper.pdf>) (finding based on LP data that – Lengthy (3 years or more) prepayment penalties increase foreclosure risk by about 20 percent; Balloons increase foreclosure risk by about 50 percent; ARMs have a 50 percent higher foreclosure risk than FRMs); Morgan J. Rose, *Foreclosure of Subprime Mortgages in Chicago: Analyzing the Role of Predatory Lending Practices*, WP, August 2006 [RA: Get (in References/Mortgage)].

¹³⁷ See FTC Comments, *supra*, at 8.

¹³⁸ FRB Proposed Rule, *supra*, at 1687-88 (“Consumers may also benefit from loans with payments that could increase after an initial period of reduced payments if they have a realistic chance of refinancing, before the payment burden increases substantially, into lower-rate loans that were more affordable on a longer-term basis. This benefit is, however, quite uncertain, and it is accompanied by substantial risk. Consumers would have to both improve their credit scores sufficiently and accumulate enough equity to qualify for lower-rate loans. Concerns about the affordability after reset of 2–28 and 3–27 ARMs originated from 2005 to early 2007 illustrate the hazards of counting on both developments occurring before payments become burdensome. Marketed as “affordability products,” these loans often were made with high loan-to-value ratios on the assumption that house prices would appreciate. In areas where house price appreciation slowed or prices declined outright, the assumption proved unreliable. Moreover, the Board is not aware of evidence on the proportion of such borrowers who were actually able to raise their credit scores enough to qualify for lower-rate loans had they accumulated sufficient equity. In short, evidence

But there is a more plausible version of this rational choice theory. A rational borrower will form rational expectations about future home prices. This borrower may rationally believe, for example, that there is an 80 percent chance that the value of her home will increase by 50 percent over the next two years and a 20 percent chance that the value of her home will decrease by 50 percent over the next two years. If home value increases, the borrower will prepay, avoid the high post-reset payments, and profit from her investment in real-estate.¹³⁹ If home value decreases, the borrower will default, again avoiding the high post-reset payments, and return to the rental market.

The explanatory power of this theory is a function of several variables, primarily the expected home value when the interest rate on the loan resets, the expected benefits and costs of prepayment when home values rise, and the expected costs of default and foreclosure when home values fall (or do not rise fast enough).¹⁴⁰ Starting with default costs, the proposed strategy is optimal only if the cost of default and foreclosure are sufficiently small. Otherwise, even a low probability of a downturn in home prices eliminates the appeal of a deferred-cost contract. The cost of default will depend on the borrower's accumulated equity, on the size of the transaction costs associated with foreclosure and relocation, and on the damage to the borrower's credit history.

Next consider the costs and benefits of the prepayment option. The availability and value of the prepayment option depends on several factors. First, delinquency will make it difficult for the borrower to refinance on attractive terms. Second, selling a house or refinancing it will be more difficult when a high LTV (i.e., a low downpayment) and zero or negative amortization, both common in subprime loans, leave the owner with low, even negative, equity in her home.¹⁴¹ Finally, prepayment penalties increase the cost of

from recent events is consistent with a conclusion that a widespread practice of making subprime loans with built-in payment shock after a relatively short period on the basis of assuming consumers will accumulate sufficient equity and improve their credit scores enough to refinance before the shock sets in can cause consumers more injury than benefit.”)

¹³⁹ If home prices are rising, then it clearly makes sense to invest in real estate. But there is more than one way to invest in real estate. Purchasing a home with the help of a deferred-cost mortgage is a relatively risky way to invest in the real estate market. There are other, less risky avenues for investment in real estate, such as purchasing shares of a REIT. Of course, these other investment options may not be open to subprime borrowers.

¹⁴⁰ Another important variable is rental prices. If mortgage payments, specifically low introductory-period payments, are substantially lower than rent payments, taking a deferred-cost mortgage can be attractive, even if the plan is to default at the end of the introductory period. [Find data on rental prices and compare to monthly payments at the introductory period.]

¹⁴¹ See FTC Comments, *supra*, at 10. See also Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 3 (2007) (“The first key insight from the model is that negative equity is a necessary but not sufficient condition for default, because selling dominates defaulting if a borrower has positive equity. However, negative equity is not sufficient for default, because future house price appreciation may make it profitable to continue making mortgage payments. We argue that cash flow, or lack thereof, then determines whether it is optimal to default – if a borrower must make extreme sacrifices in term of current consumption to realize benefits in the distant future, it may not make sense to continue paying the mortgage, but if the sacrifice to current consumption is small, it may make sense to continue

prepayment.¹⁴² Of course, if home prices increase fast enough, then this increase will compensate for the high LTV and zero or negative amortization. A theory based on prepayment must assume that borrowers rationally expected home prices to increase (or interest rates to fall). This is true even with low LTV and positive amortization. With high LTV and zero or negative amortization, the prepayment argument depends on even faster appreciation of home prices.¹⁴³

The preceding description emphasized the costs associated with a strategy of taking deferred-cost mortgages with a plan to avoid payment of the high deferred costs. But despite all these costs this strategy is still perfectly rational if home prices are expected to rise fast enough and for a sufficiently long period of time. One question, therefore, is whether such expectations were rational for borrowers to hold. An initial observation is that during the subprime expansion home prices were high relative to underlying fundamentals.¹⁴⁴ As noted by the CBO: “[F]or a time, the expectation of higher prices became a self-fulfilling prophecy that bore little relation to the underlying determinants of demand, such as demographic forces, construction costs, and the growth of household income.”¹⁴⁵ While “homebuyers’ expectations of home prices may deviate from long-term fundamentals for extended periods of time,”¹⁴⁶ are such expectations necessarily irrational? A rational borrower may recognize that home prices must fall eventually, but

making payments.”); Stavros Peristiani et al., *Credit, Equity, and Mortgage Refinancings*, 1997 (July) Federal Reserve Bank of New York Policy Review 83 (1997) (high LTV operates to constrain prepayments).

¹⁴² CBO Testimony, supra (“Faced with prepayment penalties (which protected lenders from the potential churning of mortgages with very low initial rates), such borrowers often found it expensive to refinance their mortgages to avoid the increasing payments.”)

¹⁴³ See FRB Proposed Rule, supra, at 1687-88 (“Consumers may also benefit from loans with payments that could increase after an initial period of reduced payments if they have a realistic chance of refinancing, before the payment burden increases substantially, into lower-rate loans that were more affordable on a longer-term basis. This

benefit is, however, quite uncertain, and it is accompanied by substantial risk. Consumers would have to both improve their credit scores sufficiently and accumulate enough equity to qualify for lower-rate loans. Concerns about the affordability after reset of 2–28 and 3–27 ARMs originated from 2005 to early 2007 illustrate the hazards of counting on both developments occurring before payments become burdensome. Marketed as “affordability products,” these loans often were made with high loan-to-value ratios on the assumption that house prices would appreciate. In areas where house price appreciation slowed or prices declined outright, the assumption proved unreliable. Moreover, the Board is not aware of evidence on the proportion of such borrowers who were actually able to raise their credit scores enough to qualify for lower-rate loans had they accumulated sufficient equity. In short, evidence from recent events is consistent with a conclusion that a widespread practice of making subprime loans with built-in payment shock after a relatively short period on the basis of assuming consumers will accumulate sufficient equity and improve their credit scores enough to refinance before the shock sets in can cause consumers more injury than benefit.”)

¹⁴⁴ Robert J. Shiller, *Understanding Recent Trends in House Prices and Homeownership*, NBER Discussion Paper No. 13553, pp. 4-5 (2007).

¹⁴⁵ CBO Testimony, supra. One indicator, cited by both Shiller and the CBO, that housing prices were high relative to underlying fundamentals, particularly in 2005-2006, was the ratio of housing prices to rents. See Shiller, supra, at 4-5; CBO, supra. On the limits of this indicator – see Peter R. Orszag, *Housing Price – Rental Ratios*, CBO, Director’s Blog, Dec. 21st, 2007 (available at <http://cboblog.cbo.gov/?p=52L>); Jonathan McCarthy and Richard W. Peach, “Are Home Prices the Next ‘Bubble’?” *Federal Reserve Bank of New York Economic Policy Review*, vol. 10, no. 3 (December 2004), pp. 1–17.

¹⁴⁶ CBO Testimony, supra.

expect that the correction will not occur before he exits the market. And this expectation, while proved to be mistaken for many subprime borrowers, may well have been rational.

I cannot rule out this explanation. The more sophisticated borrowers may well have been riding the bubble, rationally.¹⁴⁷ But while in theory bubbles can occur in markets populated by only perfectly rational traders,¹⁴⁸ the more convincing accounts, at least for housing markets, describe bubbles as a result of an interaction between rational and irrational traders.¹⁴⁹ The imperfect rationality of some traders contributes to the occurrence of bubbles on two distinct, but related levels. First, the imperfectly rational traders fail to correctly value the asset according to fundamentals.¹⁵⁰ This manifestation of imperfect rationality has been detected even in experimental markets where traders are provided with information that would allow them to calculate the value of a relatively simple asset.¹⁵¹ If traders make mistakes in these simple, complete-information environments, it would be surprising if borrowers did not make mistakes in the subprime mortgage market where they need to value much more complex products with much less information.

If imperfectly rational traders are unable to accurately value the asset according to fundamentals, how do they value the asset? It is here that the second manifestation of imperfect rationality comes into play. The less-sophisticated traders irrationally extrapolate from past price trends. In the context of the housing bubble: If home prices increased over the past year, then they will continue to increase over the next year. The imperfectly rational borrower overestimates the correlation between past trends and future price movements. Evidence of such irrational extrapolation has been documented by Karl Case and Robert Shiller.¹⁵² Moreover, Case and Shiller found that home buyers

¹⁴⁷ The riding-the-bubble theory seems more plausible for the Wall Street banks who securitized and sold the MBSs and for their sophisticated clients who purchased these MBSs. And there is reason to believe that even these sophisticated parties were making irrational assessments. See CBO Testimony, *supra* (“the rating agencies appear to have miscalculated the risks of some securities backed by subprime loans, and they may have unduly emphasized the unusual period of appreciating prices.”)

¹⁴⁸ See Colin F. Camerer, *Bubbles and Fads in Asset Prices*, 3 *Journal of Economic Surveys* 3, 4-6 (1989) (surveying the literature on rational “growing bubbles”).

¹⁴⁹ See Camerer, *supra*, at 8-9 (describing the restrictive conditions necessary to sustain rational bubbles). Focusing on real estate bubbles, the high transactions costs in the housing market limit the power of arbitrage – the economic force charged with eliminating irrationality and inefficiency. See Case, Karl E., and Robert J. Shiller, “The Efficiency of the Market for Single Family Homes,” *American Economic Review*, 79:1, 125-37, March, 1989; Shiller (2007), *supra*, at 6.

¹⁵⁰ See, e.g., Vivian Lei, Charles N. Noussair, and Charles R. Plott, *Nonspeculative Bubbles in Experimental Asset Markets: Lack of Common Knowledge of Rationality Vs. Actual Irrationality*, 69 *Econometrica* 831, 857-58 (2001) (finding bubbles in experimental settings and arguing that these bubbles are explained by trader irrationality).

¹⁵¹ See, e.g., Lei et al, *supra*, at 857-58.

¹⁵² See Karl E. Case and Robert J. Shiller, *The Behavior of Home Buyers in Boom and Post Boom Markets*, 1988 *New England Economic Review* 29-46 (1988); Robert J. Shiller, *Speculative Prices and Popular Models*, 4(2) *J. Econ. Persp.* 55, 58-61 (1990). Case and Shiller repeated their study for the recent housing bubble, obtaining similar results. See Case, Karl E., and Robert J. Shiller, “Home Buyer Survey Results 1988-2006,” unpublished paper, Yale University, 2006. See also Shiller (2007), *supra*, at 11. Similar irrational extrapolation was documented by Case and Shiller during a previous housing bubble. A similar phenomenon was observed in experimental markets. After receiving complete information about the asset’s value and demonstrating good understanding of this value, traders quickly abandoned fundamentals

care little about fundamentals, believe that home prices cannot decline, but do not attribute price trends to market-psychology.¹⁵³ Now, recall, that this theory of bubbles, while relying on the existence of some irrational traders, allows for the existence of other, rational traders. What will rational traders do when irrational traders are chasing price trends? It is likely that rational traders will also chase the trend, at least in the short-run. Thus, rational traders also contribute to the boom.¹⁵⁴

Both theory and evidence support the proposition that imperfect rationality of some, not all, home buyers contributed to the housing boom. In particular, the evidence collected by Case and Shiller shows that expectations of future price increases were not formed rationally. Now return to the strategy of taking deferred-cost mortgages with a plan to avoid payment of the high deferred costs. I have acknowledged that this could be a rational strategy if based on rational expectations of sufficiently high and sufficiently persistent increases in future home prices. While for some borrowers the expectation of rising prices was based on a rational, though ultimately mistaken, prediction, for many others the expectation of rising prices was irrational. These imperfectly rational borrowers, even if they recognized that housing prices will not go up forever, their estimates about the timing and extent of the correction were optimistic.

I have thus far focused on the borrower's perspective. It is rational for a borrower to take a deferred-cost loan if she expects to get out – through prepayment or default – before the loan resets to the higher rate. But there is another party involved – the lender. Why would a lender offer a deferred-cost loan to such rational borrowers? If home prices go down, the borrower will default, leaving the lender with the low-value collateral. And if home prices go up, the borrower will prepay, depriving the lender of the high, post-reset payments. The lender could compensate for this loss by specifying a prepayment penalty.¹⁵⁵ But this only begs the question: why offer a low initial rate coupled by a prepayment penalty rather than a constant, higher rate and no prepayment penalty?¹⁵⁶

and reinforcing each other's trading behavior generated bubbles. See Sheen S. Levine and Edward J. Zajac, *The Institutional Nature of Price Bubbles*, Working Paper (June 20, 2007) (available at SSRN: <http://ssrn.com/abstract=960178>).

¹⁵³ See Karl E. Case and Robert J. Shiller, *The Behavior of Home Buyers in Boom and Post Boom Markets*, 1988 New England Economic Review 29-46 (1988); Robert J. Shiller, *Speculative Prices and Popular Models*, 4(2) J. Econ. Persp. 55, 58-61 (1990).

¹⁵⁴ Andrei Shleifer and Lawrence H. Summers, *The Noise Trader Approach to Finance*, 4(2) J. Econ. Persp. 19, 28-29 (1990); Bradford J. De Long, Andrei Shleifer, Lawrence H. Summers, and Robert J. Waldmann, *Positive Feedback Investment Strategies and Destabilizing Rational Speculation*, __ J. Fin. __ (1990); Bradford J. De Long, Andrei Shleifer, Lawrence H. Summers, and Robert J. Waldmann, *Noise Trader Risk in Financial Markets*, 98 J. Political Economy 703 (1990). See also Robert J. Shiller, *Irrational Exuberance* (2nd Edition, Princeton: Princeton University Press, 2005) (developing a market-psychological theory of bubbles).

¹⁵⁵ Prepayment penalties are valuable to lenders, especially in the subprime market where prepayment rates are high. Lenders compensate borrowers with lower interest rates. See Michael Lacour-Little, *Call Protection in Mortgage Contracts*, WP, pp. 20-21, November 22, 2005.

¹⁵⁶ The behavioral theory has an immediate response: The non-salient price dimension goes up and the salient price dimension goes down.

I have raised some questions about the theory behind this rational choice explanation. But the real challenge to the rational choice account comes from the data. Recall, the argument was that rational borrowers should prefer deferred-cost loans if they expect to get out before the high-payment period begins. The difficulty with this account is that many borrowers did not get out in time, but rather stayed on to pay the high post-reset rates. And this was true even in 2005 before the subprime crisis exploded.¹⁵⁷

B. Proliferation of Fees

As explained in Part II, many different services and many different costs are associated with the mortgage transaction. In the past, most of these costs were folded into the loan's interest rate. Now lenders (and their affiliates: mortgage settlement/closing companies and servicers) charge separate fees for each service rendered or cost incurred. There are several rational choice explanations for the proliferation of fees.

First, to the extent that some services are optional, setting separate prices for these services allows for more efficient tailoring of the product to the needs and preferences of different borrowers. This explanation is plausible for some services and fees but not for others. Specifically, it is not plausible for the many non-optional services that all borrowers purchase, e.g., document preparation, appraisals, etc'.¹⁵⁸

Second, the move from a single price to multiple prices enables risk-based pricing and prevents cross-subsidization among borrowers. If the costs of delinquency and foreclosure proceedings are folded into the interest rate, then non-defaulting borrowers will pay for the delinquency and foreclosures of defaulting borrowers. Separate late fees and foreclosure fees eliminate this cross-subsidization. Again, this explanation is plausible for certain fees, but not for others.

C. Heterogeneity in Cognitive Ability

The explanatory power of the behavioral theory proposed in Part III can only be assessed in comparison with the rational choice theories considered in this Part. I cannot rule out the rational choice explanations. And that is because they are valid for some borrowers, the more-sophisticated borrowers. Still, I argue, that for the many, less-sophisticated borrowers these rational choice explanations are not persuasive.

Available evidence suggests that imperfect rationality is pervasive in the residential mortgage market. Survey studies, collected by the FRB and the FTC, found that

¹⁵⁷ The average age of a subprime ARM in 2005 was 2 years. See MBA Research, *Data Notes: Characteristics of Outstanding Residential Mortgage Debt: 2006*, P. 2, Chart 7 (2007). A 2-year average implies that many borrowers were paying well after the 2-year mark, which is also the reset point for most loans. [Ask Otto if he has data on average loan age. Otto's Figure 1 shows that only 10 percent of 2005 loans were delinquent after 24 months (the figure does not extend to 24 months for the 2006 vintage, given the date of Otto's paper), but this does not account for possible prepayments.]

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borrowers do not understand mortgage terms.¹⁵⁹ Other studies have documented specific mistakes that borrowers consistently make.¹⁶⁰ It seems that few people dispute the fact that at least some borrowers did not enter into their subprime mortgage contracts with a full understanding of the costs and benefits associated with these contracts.¹⁶¹

¹⁵⁹ CITE: FRB study finding that borrowers don't understand mortgage terms; James M. Lacko and Janis K. Pappalardo, *Improving Consumer Mortgage Disclosures: An Empirical Assessment of Current and Prototype Disclosure Forms*, Federal Trade Commission Bureau of Economics Staff Report (June, 2007) (showing that many borrowers do not understand mortgage terms and demonstrating the limits of mortgage disclosures) [Get more info from Making Credit Safer].

¹⁶⁰ See Making Credit Safer; articles at <http://www.ftc.gov/bcp/menus/resources/articles/credit.shtm>; Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, p. 3 (2007) [FN 3 lists references of papers that document and explain puzzling behavior of mortgage holders. RA: Summarize these papers.] Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, p. 3 (2007) (surveying evidence that borrowers fail to make optimal refinancing decisions). A recent study by Sumit Agarwal, John Driscoll, Xavier Gabaix and David Laibson, using records on 75,000 home-equity loans made in 2002, identified persistent consumer mistakes in loan applications. In particular, consumer mistakes in estimating home values increased the loan-to-value ratio and thus the interest rate charged. Such mistakes increase the APR by an average of 125 basis points for home equity loans and 150 basis points for home equity lines of credit. While only 5% of borrowers in their 40s and 50s made "rate changing mistakes" mistakes, more than 40% of younger and older borrowers made these mistakes, with the likelihood of mistake reaching 80% for some age groups. See Sumit Agarwal, John C. Driscoll, Xavier Gabaix, & David Laibson, *The Age of Reason: Financial Decisions over the Lifecycle*, pp. 11-13 (MIT Dep't of Econ. Working Paper No. 07-11, 2007) (available at <http://ssrn.com/abstract=973790>). These findings are consistent with survey evidence indicating that younger and older borrowers have been more likely to use non-traditional products. See MBA, *The Residential Mortgage Market and Its Economic Context in 2007*, p. 22 (2007) ("A recent Wall Street Journal Online/Harris Interactive personal-finance poll indicated that younger borrowers have been more likely to use non-traditional products. For example, the poll indicated that 23 percent of 18-34 year old borrowers have an interest only product, while only 7 percent of 45-54 year old borrowers do."); See Marsha J. Courchane et al, *Subprime Borrowers: Mortgage Transition and Outcomes*, 29(4) *Journal of Real Estate Finance and Economics* 365, 372 (2004) (finding, based on a survey study, that subprime borrowers are older). The MBA suggests that the identified age patterns "[align] with the notion that these products are often used to extend affordability." Id. Evidence also suggests that the borrower's education level affects loan terms. See Thomas P. Boehm and Alan Schlottmann, *Mortgage Pricing Differentials Across Hispanic, African-American, and White Households: Evidence From the American Housing Survey*, 9 *Cityscape: A Journal of Policy Development and Research* 93, 105 (2007) (finding a negative correlation between education and interest rates). This evidence lends further support to the hypothesis that borrowers, specifically less-educated borrowers, make mistakes.

¹⁶¹ Paulson Remarks, supra ("We need simple, clear, and understandable mortgage disclosure. We must identify what information is most critical for borrowers to have so that they can make informed decisions. At closing, homebuyers get writer's cramp from initialing pages and pages of unintelligible and mostly unread boilerplate that appears to be designed to insulate the originator or lender from liability rather than to provide useful information to the borrower. We can and must do better."); FRB Proposed Rule, supra, at 1675-76 ("Consumers who do not fully understand such terms and features, however, are less able to appreciate their risks, which can be significant. For example, the payment may increase sharply and a prepayment penalty may hinder the consumer from refinancing to avoid the payment increase. Thus, consumers may unwittingly accept loans that they will have difficulty repaying."); CBO Testimony, supra. ("The rise in defaults of subprime mortgages may also reflect the fact that some borrowers lacked a complete understanding of the complex terms of their mortgages and assumed mortgages that they would have trouble repaying.")

D. Market Correction

Individuals are imperfectly informed and imperfectly rational. Yet most markets work reasonably well despite these imperfections. Several market correction mechanisms operate to minimize the effects of imperfect information and imperfect rationality. These correction forces are present also in the subprime mortgage market. But, as I elaborate below, they are weaker in this market. For this reason the desirable changes that we are now seeing in lending practices began only after the subprime market collapsed.

1. On the Demand Side: Learning by Borrowers

Individuals make mistakes.¹⁶² But individuals also learn from their mistakes, and learn not to repeat these mistakes. While learning is not absent from the mortgage market, it is slower. The reason is that the mortgage contracts that individuals sign over a lifetime are few and far apart.¹⁶³ More generally, the evidence shows that learning about financial decisions is incomplete.¹⁶⁴

In many markets effective learning occurs when individuals, aware of their limitations, seek expert advice. This mechanism also works imperfectly in the mortgage market. Borrowers commonly seek the advice of brokers who face an incentive structure that prevents them from being loyal agents of the buyer-borrower. A market for buyers', or borrowers', agents could have evolved to solve this problem. But it hasn't.¹⁶⁵ Moreover, the complexity of the subprime mortgage contract is such that even so-called experts often get it wrong. For example, a recent study by Sumit Agarwal, John C. Driscoll, and David Laibson has shown that available expert advice on refinancing ignores the option value of postponing the prepayment decision – an omission that can cost borrowers up to 25 percent of loan value.¹⁶⁶

¹⁶² Not all individuals make mistakes. In theory, even a minority of informed, sophisticated borrowers will induce sellers to offer welfare-maximizing products and contracts. See Schwartz and Wilde. The informed minority argument has only limited relevance in the subprime mortgage market where lenders can segment the market, offering different contracts to sophisticated and less-sophisticated borrowers. See Making Credit Safer; Eskridge, *supra*, at 1141-1143.

¹⁶³ See Benartzi and Thaler (2007) (learning is especially limited in the case of low-frequency decisions like installment borrowing and long-term saving). [RA: Get citations from Victor Stango and Jonathan Zinman, *Fuzzy Math and Household Finance: Theory and Evidence*, Working Paper, pp. 5 [FN 9] (2007).] See also FRB Proposed Rule, *supra*, at 1675-76 (“Disclosures themselves, likely cannot provide this minimum understanding for transactions that are complex and that consumers engage in infrequently.

¹⁶⁴ See Agarwal, Chomsisengphet, Liu and Souleles 2006; Agarwal, Driscoll, Gabaix and Laibson 2007. Experimental evidence suggests that while learning is generally effective in minimizing mistakes, biases in relatively abstract domains like math and finance are more resilient. See Gilovich, Griffin and Kahneman (2002); Stanovich (2003). [RA: Get citations from Victor Stango and Jonathan Zinman, *Fuzzy Math and Household Finance: Theory and Evidence*, Working Paper, pp. 5 [FN 9] (2007).]

Even financial professionals, with ample opportunity to learn, do not always learn. See Haigh and List (2005) (documenting persistent bias (myopic loss aversion) among financial professionals).

[RA: Get citations from Victor Stango and Jonathan Zinman, *Fuzzy Math and Household Finance: Theory and Evidence*, Working Paper (2007)]

¹⁶⁵ Eskridge, *supra*, at 1194-1196.

¹⁶⁶ See Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, pp. 24-25 (2007) (“Most of the advice boils down to the

2. On the Supply Side: Mistake Correction by Sellers and Reputation Effects

Competing sellers will often have an incentive to correct consumer mistakes, e.g., through advertising.¹⁶⁷ While these incentives are not always sufficient in competitive markets, they are even weaker in imperfectly competitive markets.¹⁶⁸ As explained above, ineffective shopping by borrowers inhibits competition in the subprime mortgage market.¹⁶⁹ In many markets seller reputation provides a powerful defense against the abuse of consumers. But, again, reputational forces are weaker in the subprime mortgage market. First, there is little repeat business, as a single borrower takes few mortgage loans and a relatively long time passes between loans. Second, lenders are relatively short-lived.¹⁷⁰ A downside of the securitization innovation was the opening of the market to fly-by-night originators that had little reputation to lose and insufficient incentives to build a reputation.¹⁷¹

V. Welfare Implications

What are the costs of the identified contractual designs? In answering this question I will distinguish between costs born by borrowers and general welfare costs.

A. Hindered Competition

I begin with the excessive complexity and multidimensionality of subprime loan contracts. Perhaps the largest cost associated with excessively complex contracts comes from the inhibited competition that they foster. Complexity prevents effective comparison shopping, which is necessary for vigorous competition. The market power gained by lenders clearly helps lenders at the expense of borrower. But the limited competition also imposes a welfare cost in the form of allocative inefficiency: borrowers are not matched with the most-efficient lender.

following necessary condition for refinancing—only refinance if you can recoup the closing costs of refinancing in reduced interest payments.... None of the 15 books and 10 web sites in our sample discuss (or quantitatively analyze) the value of waiting due to the possibility that interest rates might continue to decline.”)

¹⁶⁷ Bar-Gill, *The Behavioral Economics of Consumer Contracts*; Bar-Gill, *Informing Consumers About Themselves*.

¹⁶⁸ Bar-Gill, *The Behavioral Economics of Consumer Contracts*; Bar-Gill, *Informing Consumers About Themselves*.

¹⁶⁹ See *supra* Part I.

¹⁷⁰ As evidenced by the number of loan originators that have gone out of business during the recent crisis. See [RA: CITE] See also Eskridge, *supra*, at 1143. [RA: Check]

¹⁷¹ See Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2041 (2007) (“[S]ecuritization funds small, thinly capitalized lenders and brokers, thus allowing them to enter the subprime market. These originators are more prone to commit loan abuses because they are less heavily regulated, have reduced reputational risk, and operate with low capital, helping to make them judgment-proof.”) So, while securitization reduces entry barriers and thus enhances competition, it is not clear that this enhanced competition is welfare-enhancing.

The limits of competition in the subprime mortgage market are reflected in evidence of above-cost pricing. In particular, borrowers are paying more interest than their risk profile justifies.¹⁷² The most extreme case is that of borrowers that would qualify for lower-cost conventional loans, but are nonetheless obtaining high-cost subprime mortgages.¹⁷³ It is the higher profit margin in the subprime market that induced lenders to steer borrowers into subprime loans.¹⁷⁴ This problem was explicitly recognized by the

¹⁷² See Peter Zorn, *Subprime Lending: An Investigation of Economic Efficiency* (Freddie Mac, Dec. 21, 2000) (Subprime interest rates cannot be justified by risk); Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2058 (2007); Eric Stein, *Quantifying the Economic Costs of Predatory Lending*, pp. 9-11 (Coalition for Responsible Lending, 2001) (estimating the cost to borrowers of excess interest at \$2.9 billion).

¹⁷³ See Fannie Mae March 2, 2000 press release at page four: <http://www.fanniemae.com/news/pressreleases/0667.html> (up to half of subprime borrowers would qualify for lower cost conventional loans); Freddie Mac Special Report on Automated Underwriting (Sep. 1996) at <http://www.freddiemac.com/corporate/reports/moseley/chap5.htm> (10-35 percent of subprime borrowers would qualify for lower cost conventional loans); Freddie Mac, "Half of Subprime Loans Categorized as 'A' Quality," *Inside B&C Lending* (June 10, 1996) (a poll of 50 subprime lenders who estimate that half could have qualified for prime loans); Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2058, FN 92 (2007); Bar-Gill and Warren, *Making Credit Safer* (2008); Rick Brooks and Ruth Simon, *Subprime Debacle Traps Even Very Credit-Worthy*, *Wall Street Journal*, p. A1, December 3, 2007 ("The analysis also raises pointed questions about the practices of major mortgage lenders. Many borrowers whose credit scores might have qualified them for more conventional loans say they were pushed into risky subprime loans. They say lenders or brokers aggressively marketed the loans, offering easier and faster approvals -- and playing down or hiding the onerous price paid over the long haul in higher interest rates or stricter repayment terms...The subprime sales pitch sometimes was fueled with faxes and emails from lenders to brokers touting easier qualification for borrowers and attractive payouts for mortgage brokers who brought in business. One of the biggest weapons: a compensation structure that rewarded brokers for persuading borrowers to take a loan with an interest rate higher than the borrower might have qualified for."); See Gretchen Morgenson, *Inside the Countrywide Lending Spree*, *New York Times*, August 26, 2007 ("On its way to becoming the nation's largest mortgage lender, the Countrywide Financial Corporation encouraged its sales force to court customers over the telephone with a seductive pitch that seldom varied. "I want to be sure you are getting the best loan possible," the sales representatives would say. But providing "the best loan possible" to customers wasn't always the bank's main goal, say some former employees.... Countrywide's entire operation, from its computer system to its incentive pay structure and financing arrangements, is intended to wring maximum profits out of the mortgage lending boom no matter what it costs borrowers, according to interviews with former employees and brokers who worked in different units of the company and internal documents they provided. One document, for instance, shows that until last September the computer system in the company's subprime unit excluded borrowers' cash reserves, which had the effect of steering them away from lower-cost loans to those that were more expensive to homeowners and more profitable to Countrywide.")

[What does "prime" borrower mean? A high-FICO score borrower taking a 95% CLTV loan is as risky as a low-FICO score borrower taking an 80% CLTV loan. – Check if these sources account for these other risk factors.]

¹⁷⁴ See Gretchen Morgenson, *Inside the Countrywide Lending Spree*, *New York Times*, August 26, 2007 (Internal Countrywide documents and testimonies of former employees reveal larger profit margins on subprime as compared to prime loans, and especially large margins on loans with high prepayment penalties and high go-to rates. As a result commission structure rewarded brokers and sales representatives who sold subprime loans (including to borrowers who qualified for Alt-A loans), loans with higher and longer prepayment penalties and loans with higher go-to rates.) The alternative hypothesis that the relative increase in subprime loans reflects an increase in borrower risk is rejected by the evidence. See LaCour-Little, *supra*, at 14 (showing empirically that borrower risk remained relatively stable). [It is possible that

FRB: “[A]n atmosphere of relaxed standards may increase the incidence of abusive lending practices by attracting less scrupulous originators into the market, while at the same time bringing more vulnerable borrowers into the market. These abuses can lead consumers to pay more for their loans than their risk profiles warrant.”¹⁷⁵

B. Distorted Competition

Limited competition allows lender to set above-cost prices and reap supra-competitive profits. But even if borrowers engaged in vigorous shopping, eliminating all supra-competitive profits, still there would be a welfare cost. The reason is that borrowers’ shopping, while vigorous, would be misguided. Consider a stylized example of a mortgage contract with a two-dimensional price: an introductory rate, R_1 , and a long-term rate, R_2 . The two prices, R_1 and R_2 , affect the two decisions a borrower must make: whether to get out of the loan at the end of the introductory period and whether to take the loan in the first place. An optimal contract will set the two prices to induce efficient decisions. Denote this optimal contract by (R_1^*, R_2^*) . If lenders and borrowers are perfectly rational, then a competitive market would offer this optimal contract.

Now assume that borrowers are imperfectly rational. Specifically, assume that borrowers underestimate the costs associated with the long-term rate, R_2 . These borrowers, when shopping for a loan, will focus on the introductory rate, R_1 . With such skewed demand, competition among lenders will drive down the introductory rate below R_1^* . Of course, lenders would have to compensate by raising the long-term rate above R_2^* . This will distort borrowers’ decisions and reduce welfare. First, the excessively high R_2 will inefficiently prevent some borrowers from exiting at the end of the introductory period. Second, the initial decision to take a loan will be distorted. While total expected payment will remain unchanged, since the higher R_2 will offset the lower R_1 , the total expected payment as perceived by the borrower will be lower. The result: excessive borrowing (and excessive home purchases).¹⁷⁶

Prepayment penalties provide an example of both distorted competition and limited competition. Lenders compete on the salient short-term interest rate and raise long-term prices, e.g., by imposing a prepayment penalty. As argued above, this distortion entails a welfare cost even if the total expected cost to borrowers is not increased by the shifting of costs onto the long-term, non-salient price dimension.¹⁷⁷ Yet, evidence suggests that the

while borrower risk (FICO score) remained stable, risk nevertheless increased, e.g., due to higher LTVs. Check if LaCour-Little controls for this.]

¹⁷⁵ FRB Proposed Rule, *supra*, at 1675.

¹⁷⁶ Excessive borrowing would result even absent a contractual design response, i.e., even under the optimal contract (R_1^*, R_2^*) . The welfare cost is exacerbated by the contractual design response.

¹⁷⁷ Prepayment penalties have the potential to exacerbate the costly mistakes that many borrowers make in exercising their prepayment option. Evidence shows that borrowers fail to make optimal refinancing decisions – they both refinance too late and refinance too early. See Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, p. 3 (2007) (surveying the evidence). And these mistakes are costly – up to 25 percent of the loan amount. Id at 28 (following the NPV rule, instead of the optimal refinancing rule, leads to substantial expected losses: \$26,479 on a \$100,000 mortgage, \$49,066 on a \$250,000 mortgage, \$86,955 on a \$500,000 mortgage,

total expected cost to borrowers does increase: the expected costs in penalties paid exceed the benefits from lower short-term interest rates.¹⁷⁸ More generally, the FRB recently observed that deferred-costs contracts, based on optimism about refinancing possibilities, “cause[d] consumers more injury than benefit.”¹⁷⁹

C. Delinquency and Foreclosure

There is evidence that the identified contractual design features increase delinquency and foreclosure rates. Specifically, deferred-cost contracts are associated with higher rates of delinquency and foreclosure.¹⁸⁰ A recent study estimates that 32 percent of loans with teaser rates will default due to reset.¹⁸¹ Prepayment penalties and balloon payments are also associated with increase delinquency and foreclosure rates.¹⁸² And so are high LTVs, i.e., small downpayments.¹⁸³ The FRB, in its recent proposal to amend TILA,

\$163,235 on a \$1,000,000 mortgage). Prepayment penalties can be expected to exacerbate the costs of excessive delay in refinancing a loan.

¹⁷⁸ Michael Lacour-Little, *Prepayment Penalties in Residential Mortgage Contracts: A Cost-Benefit Analysis*, WP, p. 26 and Table 9 (2007) (finding that for the common 2/28 ARM “the total interest rate savings is significantly less than the amount of the expected prepayment penalty.”) [Details (from Table 9): Average loan size: \$135,795; The probability of prepayment (within 2 years) without a penalty: 20% → The expected cost of prepayment: \$1,025; The note rate reduction: 0.0012 → The Interest Expense Savings Over Penalty Period: \$326. → Net cost: \$700. (Assumes that the penalty will not have a deterrence effect. Accounting for this deterrence effect should reduce the cost of prepayment.) (Based on a data set of loans with subprime level credit scores but without prepayment penalties, originated between 1995 and 1997.) Other studies find a positive correlation between prepayment penalties and *higher* interest rates. See Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2060 (2007).

¹⁷⁹ FRB Proposed Rule, *supra*, at 1687-88 (“evidence from recent events is consistent with a conclusion that a widespread practice of making subprime loans with built-in payment shock after a relatively short period on the basis of assuming consumers will accumulate sufficient equity and improve their credit scores enough to refinance before the shock sets in can cause consumers more injury than benefit.”)

¹⁸⁰ See Demyanyk and Van Hemert, *supra*, Table 3 (regression results showing positive coefficients on ARM (vs FRM), Hybrid (vs FRM)). All types of mortgages originated in 2006 performed badly in terms of delinquency and foreclosure rates, not only the non-standard ARMs. But ARMs performed worse (and many ARMs are non-standard). See Demyanyk and Van Hemert, *supra*, Figure 4.

¹⁸¹ See Christopher L. Cagan, *Mortgage Payment Reset: The Issue and the Impact*, p. 4 (Santa Ana, Calif.: First American CoreLogic, March 19, 2007).

¹⁸² See Demyanyk and Van Hemert, *supra*, Table 3 (regression results showing positive coefficients on Balloon (vs. FRM) and Prepayment Penalty); Roberto G. Quercia, Michael A. Stegman, and Walter R. Davis, *The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments*, Center for Community Capitalism, Kenan Institute for Private Enterprise, University of North Carolina at Chapel Hill, p. 25 (January 25, 2005) (available at <http://www.ccc.unc.edu/documents/foreclosurepaper.pdf>) (finding based on LP data that – Lengthy (3 years or more) prepayment penalties increase foreclosure risk by about 20 percent; Balloons increase foreclosure risk by about 50 percent; ARMs have a 50 percent higher foreclosure risk than FRMs); Morgan J. Rose, *Foreclosure of Subprime Mortgages in Chicago: Analyzing the Role of Predatory Lending Practices*, WP, August 2006 (in References/Mortgage) [RA: Summarize]

¹⁸³ See Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 4 (2007) (“Subprime lenders created a group of borrowers that were much more likely to default for at least two reasons. First, while they did not invent zero-equity borrowing, they did allow a much larger fraction of borrowers to start homeownership with no cushion against negative HPA. Second, subprime lenders allowed borrowers with a history of cash flow problems and with monthly payments that exceeded fifty

acknowledged that “several riskier loan attributes,” including “high loan-to-value ratio[s]” and “payment shock on adjustable-rate mortgages,” “increased the risk of serious delinquency and foreclosure for subprime loans originated in 2005 through early 2007.”¹⁸⁴ A recent study estimates that about 12 percent of these loans will end-up in foreclosure as a result of large resets, coupled with insufficient equity to enable sale or refinance.¹⁸⁵

Delinquency and foreclosure impose significant costs on borrowers.¹⁸⁶ First, borrowers will face higher rates for other credit transactions and reduced access to credit. Second, borrowers will lose some or all of their accumulated home equity if the lender forecloses.¹⁸⁷ Foreclosed properties sell at a discount of up to 30 percent,¹⁸⁸ and foreclosures involve substantial transaction costs.¹⁸⁹ Consequently, the net proceeds from the foreclosure sale will often fall short of covering the outstanding balance on the loan, especially in a declining housing market. In these cases, the borrower will lose any equity that she accumulated in the home. Consider a borrower with 20 percent equity in her home and a loan balance equal to 80 percent the market value of the home. If the net

percent of current income to enter homeownership. Under the best of circumstances, subprime borrowers are at least five times as likely to become delinquent as prime borrowers.”)

¹⁸⁴ FRB Proposed Rule, *supra*, at 1674. See also Bernanke Speech, *supra* (“Ample evidence suggests that responsible nonprime lending can be beneficial and safe for the borrower as well as profitable for the lender. For example, even as delinquencies on subprime ARMs have soared, loss rates on subprime mortgages with fixed interest rates, though somewhat higher recently, remain in their historical range.”)

¹⁸⁵ See Christopher L. Cagan, *Mortgage Payment Reset: The Issue and the Impact*, p. 70 (Santa Ana, Calif.: First American CoreLogic, March 19, 2007).

¹⁸⁶ FRB Proposed Rule, *supra*, at 1674 (“The consequences of default are severe for homeowners, who face the possibility of foreclosure, the loss of accumulated home equity, higher rates for other credit transactions, and reduced access to credit.”)

¹⁸⁷ CRL projects a total equity loss of \$164 billion (Ellen Schloemer, Wei Li, Keith Ernst, Kathleen Keest, *Losing Ground: Foreclosures in the Subprime Market and Their Cost to Homeowners*, Center for Responsible Lending, pp. 16, 44-45 (December 2006) (these projections are conservative on some dimensions, but liberal on others; specifically the projections presume that total equity exceeds the cost of foreclosure, but for many borrowers this may not be the case). Dividing by the 7.2 million families who hold a subprime loan (Ben S. Bernanke, Speech, May 17, 2007), we get a \$23,000 loss per-family.

¹⁸⁸ See Christopher L. Cagan, *Mortgage Payment Reset: The Issue and the Impact*, p. 70 (Santa Ana, Calif.: First American CoreLogic, March 19, 2007).

¹⁸⁹ See Paul S. Calem and Michael LaCour-Little, *Risk-Based Capital Requirements for Mortgage Loans*, FEDS Working Paper 2001-60 (2001) (it costs 10 percent of unpaid balance to dispose of the foreclosed property and foreclosure transaction costs amount to 5 percent of unpaid balance); Christopher L. Cagan, *A Ripple Not a Tidal Wave: Foreclosure Prevalence and Foreclosure Discount*, First American Real Estate Solutions (2006) (“Foreclosing lenders do not want to incur extended additional costs of insurance, taxes, and maintenance for their foreclosed properties. They want to resell these properties quickly and recoup some money through the resale. Thus, lenders typically accept sale prices reduced by a percentage that will be called the ‘foreclosure discount.’”) See also Pennington-Cross, Anthony, *The Value of Foreclosed Property*, Federal Reserve Bank of St. Louis Working Paper 2004-022a (2004); Ellen Schloemer, Wei Li, Keith Ernst, Kathleen Keest, *Losing Ground: Foreclosures in the Subprime Market and Their Cost to Homeowners*, Center for Responsible Lending, pp. 44-45 (2006) (“The expected loss on foreclosure was based on three factors: the cost to dispose of the property, transaction costs, and a discount to the property’s fair market value occasioned by the general desire to prioritize reselling a foreclosed loan quickly. ... In our study, foreclosure discount is estimated by using a regression model developed by Pennington-Cross.”) It should be emphasized that while transaction costs associated with disclosure constitute a welfare loss, the disclosure discount may be largely a transfer going to the purchaser of the foreclosed property.

proceeds from the foreclosure sale – the discounted sale price minus the transaction costs – are less than 80 percent of the market value, the borrower loses all the equity that she has accumulated. Only if the net proceeds exceed 80 percent of the market value, the borrower retains part, not all, of the equity that she has accumulated.

Delinquency and foreclosure also impose costs on lenders. In particular, if the net proceeds from the foreclosure sale are smaller than the outstanding loan balance, the lender will suffer a loss. But lenders can compensate for this risk by increasing the interest rate, and there is evidence that they did just that.¹⁹⁰ Finally, foreclosure creates negative externalities at the neighborhood and city levels.¹⁹¹ The FRB noted that “[w]hen foreclosures are clustered, they can injure entire communities by reducing property values in surrounding areas.”¹⁹²

In measuring the social cost of foreclosure it is important to distinguish between costs born by borrowers and lenders on the one hand and costs born by third parties – neighbors, neighborhoods and cities – on the other hand. Focusing on borrowers and lenders, the ex post cost of foreclosure can represent a bad realization of a mutually beneficial ex ante gamble. As argued above, however, it is hard to believe that all, or even most, borrowers were sophisticated enough to secure a positive ex ante value. Now consider the costs born by third parties. These costs translate into a social cost, regardless of borrower sophistication, as long as borrowers and lenders do not internalize the costs imposed on third parties by the increased risk of foreclosure.

D. Distributional Concerns

Contractual design can also have distributional effects. While wealthier borrowers were not generally part of the subprime market, there was still heterogeneity in the wealth of subprime borrowers, and this heterogeneity increases when considering Alt-A borrowers who faced similar contractual designs. Given the complexity of these contracts borrowers who could afford to seek out expert advice were likely to do better than borrowers who could not afford such advice.¹⁹³ Moreover, the inverse correlation between borrower wealth and contractual complexity – as wealthier borrowers generally got simpler prime loans and poorer borrowers generally got more complicated subprime (or Alt-A) loans – raises another distributional concern. Distributional concerns are also raised by evidence suggesting that women suffer from a relatively poorer understanding

¹⁹⁰ See Demyanyk and Van Hemert, *supra* (finding that high loan-to-value borrowers increasingly became high-risk borrowers over the past 5 years, in terms of elevated delinquency and foreclosure rates, and that lenders were aware of this and adjusted mortgage rates accordingly over time).

¹⁹¹ See Kathleen C. Engel and Patricia M. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *Fordham L. Rev.* 2039, 2042, FN 12 (2007); Kristopher Gerardi, Adam Hale Shapiro and Paul S. Willen, *Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures*, Federal Reserve Bank of Boston WP No. 07-15, p. 1, FN 1 (citing references [Get]) (2007); Family Housing Fund, “Cost Effectiveness of Mortgage Foreclosure Prevention” (1995, republished in 1998) (cited in Stein (2001)) (citing foreclosure costs of around \$7,000 for borrowers, \$2000 for lenders, and an additional \$15000-\$60,000 on third parties); Stein (2001), pp. 11-13 (detailing externalities and citing studies [Get]).

¹⁹² FRB Proposed Rule, *supra*, at 1674.

¹⁹³ See Bar-Gill and Warren, *Making Credit Safer*.

of credit terms and are less likely to shop for credit.¹⁹⁴ These findings imply that women will get inferior mortgage products. Finally, there is evidence that better-educated borrowers received better terms on their loans.¹⁹⁵

VI. Policy Implications

I have argued that borrowers' imperfect rationality explains several contractual design features in the subprime mortgage market. I have also argued that the imperfect rationality of borrowers, especially when coupled with contracts designed in response to such imperfect rationality, produces substantial welfare costs. Since market forces have proven to be too slow to respond to these problems, legal intervention should be considered.¹⁹⁶ As emphasized above, however, the identified contractual designs, while hurting many less-sophisticated borrowers, also benefit a substantial number of more sophisticated borrowers. Therefore, regulatory reform should focus on asymmetrically paternalistic policies that can protect the less sophisticated borrowers without significantly restricting the choices available to more sophisticated borrowers.¹⁹⁷ The FRB in its recent reform proposal focuses on the most benign form of regulation: disclosure mandates. I too focus on improving the disclosure apparatus.

A. Disclosure's Failure

Since the abolition of usury laws, disclosure requirements have been the centerpiece of the regulatory scheme governing the mortgage market.¹⁹⁸ The recent crisis has convinced many that existing disclosure mandates have failed to facilitate welfare-increasing competition in the subprime market. The response is largely focused on improving and enhancing the disclosure requirements.

Secretary Henry M. Paulson, Jr. recently commented:

“We need simple, clear, and understandable mortgage disclosure. We must identify what information is most critical for borrowers to have so that they can make informed decisions. At closing, homebuyers get writer's cramp from

¹⁹⁴ Get studies cited in NYT article at <http://www.nytimes.com/2008/01/15/us/15mortgage.html?pagewanted=2&r=2&hp>.

¹⁹⁵ See Thomas P. Boehm and Alan Schlottmann, *Mortgage Pricing Differentials Across Hispanic, African-American, and White Households: Evidence From the American Housing Survey*, 9 *Cityscape: A Journal of Policy Development and Research* 93, 105 (2007) (finding a negative correlation between education and interest rates).

¹⁹⁶ The FRB, in its proposed TILA amendments, adopted a similar approach: “The market has responded to the current problems with increasing attention to loan quality. Structural factors, or market imperfections, however, make it necessary to consider regulations to help prevent a recurrence of these problems. New regulation can also provide the market clear ‘rules of the road’ at a time of uncertainty, so that responsible higher-priced lending, which serves a critical need, may continue.” FRB Proposed Rule, *supra*, at 1675.

¹⁹⁷ See Colin Camerer et al., *Asymmetric Paternalism*, *U. Penn. L. Rev.* (2003); Cass Sunstein and Richard Thaler, *Libertarian Paternalism*, *U. Chi. L. Rev.* (2003).

¹⁹⁸ On the history of mortgage-K regulation in the U.S., specifically the shift from usury laws to disclosure regulation, see Eskridge, *supra*.

initialing pages and pages of unintelligible and mostly unread boilerplate that appears to be designed to insulate the originator or lender from liability rather than to provide useful information to the borrower. We can and must do better.”¹⁹⁹

A 2004-05 study by the FTC found that many borrowers “did not understand important costs and terms of their own recently obtained mortgages. Many had loans that were significantly more costly than they believed, or contained significant restrictions, such as prepayment penalties, of which they were unaware.”²⁰⁰ These findings are echoed in a 2006 report by the GAO, which focused on Alternative Mortgage Products (AMPs).²⁰¹

The evidence suggests that current disclosures are insufficient. The problem is not that relevant information is not disclosed. Rather, the problem is that the relevant information is not disclosed effectively: First, information that is disclosed is disclosed using unclear language.²⁰² Second, disclosures are preceded or accompanied by advertising and sales pitches that emphasize benefits over risk.²⁰³ Third, disclosure often comes too late – at the consummation of the loan transaction.²⁰⁴ At this time it is no longer practical for many borrowers to comparison-shop based on the disclosed information.²⁰⁵ Fourth, a key component of the TILA apparatus, the APR, which is supposed to represent the cost of credit, excludes numerous price dimensions, e.g., prepayment penalties, late fees, title insurance fees, title examination fees, property survey fees, appraisal fees, credit report fees, document preparation fees, notary fees, flood and pest inspection fees, and seller’s

¹⁹⁹ Paulson Remarks, *supra*.

²⁰⁰ James M. Lacko and Janis K. Pappalardo, *Improving Consumer Mortgage Disclosures: An Empirical Assessment of Current and Prototype Disclosure Forms*, Federal Trade Commission Bureau of Economics Staff Report (June, 2007).

²⁰¹ GAO AMP Report, *supra* [Abstract and p. 2] (“A wider spectrum of borrowers that are now using AMPs may not fully understand their risks.”) [RA: Read and Cite GAO Report sections on the disclosure documents that GAO reviewed and the insufficiency of these disclosures.]

²⁰² GAO AMP Report, *supra* [p. 2] (“mortgage disclosures can be unclearly written and may be hard to understand.”)

²⁰³ GAO AMP Report, *supra* [p. 2] (“AMP advertising sometimes emphasizes the benefits of AMPs over their risks.”)

²⁰⁴ See Willis, *supra*, at 749-750; FTC Comments, *supra*, at 11-12. TILA does require some earlier disclosures at the application stage, and even at the advertising stage. See 12 C.F.R. §§ 226.17(b), 226.18, and 226.19(a) and (b). See also Willis, *supra*, at 744. But these disclosures are less comprehensive and less effective. [RA: Get details].

²⁰⁵ See Willis, *supra*, at 749-750; FTC Comments, *supra*, at 11-12.

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points.²⁰⁶ When certain price dimensions are excluded from the APR lenders will benefit from shifting costs to these excluded dimensions.²⁰⁷

Finally, even if all relevant information, as defined by TILA, is effectively disclosed, the implications of this information in terms of the costs and benefits associated with the loan will be unclear to many borrowers. The problem is that TILA disclosures focus on product-attribute information: rates, fees etc'. But the true cost of a loan depends also on product-use information, specifically, on the actual, rather than the nominal, term of the loan. The question of prepayment – if, when and at what cost – substantially effects the value of the mortgage product. Current disclosure provides consumers with only minimal assistance in understanding the possibilities and consequences of prepayment.²⁰⁸

B. Revitalizing Disclosure

The subprime crisis has prompted numerous initiatives aimed at enhancing disclosure requirements. These initiatives address the shortcomings of the current disclosure rules, as detailed above. In this subsection, I describe the main disclosure-related policy initiatives and evaluate them in light of the behavioral economics theory developed in Part III. I then propose my own disclosure-enhancing reform.

1. Existing Proposals

I begin with the FRB's recently proposed TILA amendments, these new regulations constitute a substantial improvement on the timing of disclosure dimension, requiring lenders to provide most information within three days after the loan application has been submitted and before any fees are charged.²⁰⁹ The FRB also proposed an enhancement of the TILA advertisements regulations. Specifically, the enhanced regulations would “ensure that low introductory or “teaser” rates or payments are not given undue emphasis.”²¹⁰ This amendment, while clearly desirable, is less likely to have a large impact, given the limited role that advertising plays in the subprime market. As recognized by the FRB, “a borrower shopping in the subprime market generally cannot obtain a useful rate quote from a particular lender without submitting an application and paying a fee.”²¹¹ The FRB is also working on a broader revision of its disclosure regulations (specifically, Regulation Z, promulgated under the TILA). In doing so, the

²⁰⁶ See OCC, Truth in Lending – Comptroller's Handbook, Finance Charge Chart (2006) (APR does not include late fees, title insurance fees, title examination fees, property survey fees, appraisal fees, credit report fees, document preparation fees, notary fees, flood and pest inspection fees, and seller's points); Willis, *supra*, at 744, 747, 750 (APR includes origination fees and points, but not interest rate escalations [all escalations or just those triggered by borrower default?], prepayment penalties, late fees, title insurance and application, appraisal, and document preparation fees); Eskridge, *supra*, at 1166-.

²⁰⁷ FRB Proposed Rule, *supra*, at 1684 (“Different combinations of interest rate and points that are economically identical for an originator produce different APRs.”)

²⁰⁸ See Oren Bar-Gill, *Informing Consumers About Themselves*, NYU Law & Economics Discussion Paper (2007).

²⁰⁹ FRB Proposed Rule, *supra*, at 1715-16. [RA: Describe the required disclosures; explain what the “good faith estimates” are.]

²¹⁰ FRB Proposed Rule, *supra*, at 1704.

²¹¹ FRB Proposed Rule, *supra*, at 1675-76.

FRB is engaged in consumer-borrower testing of different disclosure formats. Such testing can help identify the most effective way of presenting information to borrowers.

Another proposed reform targets the numerous price dimensions that are excluded from the APR measure. The proposal – to instate a more inclusive definition of finance charges – would improve the ability of the APR to serve its designated function as a uniform total-cost-of-credit measure.²¹² Moving beyond the APR, a proposal implied in the FTC’s critique of current mortgage disclosures would require lenders to provide individualized information, rather than general information.²¹³ For example, the FTC criticized a disclosure based on an atypical \$10,000 loan “with instructions advising consumers to calculate their potential loan terms based on the \$10,000 template.”²¹⁴ The FTC expressed skepticism about the ability of many consumers to “do the math” to adapt the examples in the disclosure to the loan terms they are considering.²¹⁵ Individualized disclosure, based on borrower-specific loan terms, can be more effective. These proposals, however, still focuses only on product attribute information, and fail to incorporate product use information into the disclosure regime.

2. New Proposals

The APR, a normalized measure of the total cost of credit, is perhaps the centerpiece of TILA disclosures. The APR would seem to offer an effective response to the complexity and multidimensionality of the subprime mortgage contract. Lenders are required to calculate the total costs associated with their loan product and disclose it to the borrower. With this common metric at hand borrowers should be able to compare the total cost of two different complex loan contracts. The problem is that the APR is not an accurate measure of the total cost of credit. The APR’s main flaw is its failure to account for the prepayment option—an option that has critically affected the values of subprime loans in the recent mortgage-lending expansion.²¹⁶

The prepayment option can have a substantial effect on a loan’s value—up to 25% of a loans value (or even more).²¹⁷ As a result, excluding this option from TILA’s main cost of credit measure can adversely affect borrowers as well as competition in the mortgage market. The prepayment option might render the APR disclosure misleading even with simple loan contracts. Comparing two loans, Loan A and Loan B, the APR on Loan A

²¹² Eskridge, *supra*, at 1166-: Proposing to make the APR a more useful shopping tool by including all payments within the TILA definition of “finance charges.”

²¹³ FTC Comments, *supra*, at 12, FN 55.

²¹⁴ FTC Comments, *supra*, at 12, FN 55 (citing 12 C.F.R. § 226.19(b)(2)(viii)).

²¹⁵ FTC Comments, *supra*, at 12, FN 55.

²¹⁶ This shortcoming of the APR affects the traditional FRM as well. But if all relevant loans are traditional FRMs the distortion caused by ignoring the prepayment option affects all loans in the same way. Thus, borrowers can still engage in effective comparison shopping based on the APR disclosure. [Qualify] Existing mortgage-cost calculators, including those available through government websites (see FRB and HUD websites), suffer from the same problem: They do not account for the possibility of refinancing.

²¹⁷ See Sumit Agarwal, John C. Driscoll, and David Laibson, *Optimal Mortgage Refinancing: A Closed Form Solution*, NBER Working Paper 13487, p. 28 (2007) (calculating a 25% impact for using the wrong rule to make prepayment decisions; the impact of ignoring the prepayment option altogether may well be larger).

can be lower, reflecting a lower total cost of credit absent prepayment. But with prepayment the total cost of Loan B may well be lower.²¹⁸ And this problem is exacerbated when complex contracts include a set of varying terms that interact differently with the prepayment option.

The term that most obviously affects the value of the prepayment option is the prepayment penalty term. Prepayment penalties are not incorporated into the APR. Many have expressed concerns about prepayment penalties, and the FRB has recently proposed to restrict their use in higher-priced loans.²¹⁹ The FRB recognized how difficult it could be for borrowers to calculate the expected cost of a prepayment penalty.²²⁰ Based on consumer testing commissioned by the FTC, the FRB concluded: “It is questionable whether consumers can accurately factor a contingent cost such as a prepayment penalty into the price of a loan.”²²¹ Interestingly, the FRB did not recognize the more fundamental problem of valuing the prepayment option itself, with and without a prepayment penalty.

I propose a new disclosure that would bring the prepayment option, and its limits, to the forefront of mortgage disclosures. The current APR disclosure incorporates long-term as well as short-term costs, while ignoring the prepayment option. Many borrowers responded to this shortcoming by essentially ignoring the APR disclosure. Instead, driven by a belief that refinancing will render long-term costs irrelevant – a belief that might be reinforced by the lender – they relied on the short-term price. One way to refocus borrowers’ attention on the APR is to emphasize the limits of refinancing, and consequently the mistake of relying on the short-term price. A disclosure that could accomplish this goal may read:

“Your monthly mortgage payments will increase from ___ to ___ after two years. You may be able to avoid this payment increase by refinancing your

²¹⁸ The following example is illustrative: “To see how the APR can be misleading, suppose I give you the choice of borrowing the \$100,000 at either an 8% rate and the \$1,000 fee with the 360 payments of \$733.76, or a 8.125% rate and a fee of \$100 and 360 payments of \$742.50. The APR for the 8% rate and \$1,000 fee is 8.11%, and the APR for the 8.125% rate and \$100 fee is 8.14%. Most consumers would think that the 8% rate is a better deal because the APR is lower. However, this is only true provided you do not pay off the loan early. For example, if you were able to refinance and payoff the loan after 3 years, with the 8% rate you would have paid a total of \$27,415.36 (36 payments of \$733.76 plus the \$1,000 fee). With the 8.125% rate you would have paid \$26,830 (36 payments of \$742.50 plus \$100), so the 8% rate was actually \$585.36 more expensive, even though it had a lower APR.” See <http://www.reedmc.com/APR.htm>.

²¹⁹ FRB Proposed Rule, *supra*, at ____.

²²⁰ FRB Proposed Rule, *supra*, at 1675-76 (“Subprime loans are also far more likely to have prepayment penalties. The price of the penalty is not reflected in the annual percentage rate (APR); to calculate that price, the consumer must both calculate the size of the penalty according to a formula such as six months of interest, and assess the likelihood the consumer will move or refinance during the penalty period. In these and other ways subprime products tend to be complex for consumers.”); FRB Proposed Rule, *supra*, at 1693-94 (“The injuries prepayment penalties may cause consumers are particularly concerning because of serious questions as to whether borrowers knowingly accept the risk of such injuries. Current disclosures of prepayment penalties, including the disclosure of penalties in Regulation Z § 226.18(k), do not appear adequate to ensure transparency. Moreover, a Federal Trade Commission report concluded, based on consumer testing, that even an improved disclosure of the prepayment penalty left a substantial portion of the prime and subprime consumers interviewed without a basic understanding of the penalty. [*Improving Mortgage Disclosures*, at 110.]”)

²²¹ FRB Proposed Rule, *supra*, at 1693-94.

mortgage. However, refinancing options that will allow you to avoid the payment increase, will only be available if house prices increase by ___ percent over the next two years or if market interest rates decrease by ___ over the next two years. Based on historical trends, the likelihood of such a price/rate changes is ___ percent.”

To implement this proposal the FRB will need to periodically publish estimated trajectories of house prices (by MSA) and of a benchmark interest rate. In addition, the FRB will need to provide a formula for calculating the expected interest rate that an individual borrower would be able to obtain on a refinancing loan at the end of the introductory period. This formula should be based on periodically updated analysis of the relationship between key risk factors, e.g., FICO score, LTV, and DTI, and the risk premium above the benchmark rate. Projected changes in house prices will be reflected in the LTV. The LTV and the DTI will also reflect other loan-specific parameters: The initial downpayment and contractually specified payment stream affect the borrower’s accumulated equity and thus the LTV and the DTI for the new loan. And the prepayment penalty, which would need to be financed by the new loan (or so the proposed regulation would assume), also affects the LTV and DTI. An estimated value of the average transaction costs associated with refinancing can be similarly incorporated in the LTV and DTI.²²²

The proposed disclosure is designed to emphasize the limits of refinancing and thus refocus borrowers’ attention from short-term prices to the APR. A related proposal would redefine and invigorate the APR itself. Based on the same data and projections utilized for the previous proposal, it is possible to calculate an effective APR that incorporates the prepayment option. If borrowers ignored the traditional APR figure because it ignored the prepayment option, perhaps they will embrace the proposed effective APR that incorporates the prepayment option.

As emphasized above, the formulas underlying both proposals would be based on projections of house price and interest rate trajectories. These projections would necessarily be based on a series of assumptions. While the use of assumptions is not new to disclosure regulation,²²³ it should be recognized that some degree of arbitrariness in the choice of assumption is inevitable and that the chosen assumptions will not perfectly reflect the situation of many borrowers.²²⁴ These shortcomings, however, should be weighed against the benefit of covering a big hole in the current mortgage disclosure regime.

²²² This proposal can be misleading as it ignores the option value of waiting to refinance after the introductory period has ended (and focuses on refinancing options at the end of the introductory period). However, given the concern about payment shock at the end of the introductory period, this shortcoming of the proposal appears to be of second-order importance.

²²³ Compare: Assumptions needed for calculating the total payment period for credit card debt under BAPCPA.

²²⁴ Sophisticated valuation algorithms can be used to more closely tailor predictions to specific homes and specific loans. Cf. Christopher L. Cagan, *Mortgage Payment Reset: The Issue and the Impact*, p. 5 (Santa Ana, Calif.: First American CoreLogic, March 19, 2007) (describing the valuation algorithms).

Conclusion

[To be Added]