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WHY HOUSING?
23 HOUSING POLICY DEBATE (forthcoming 2012)

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WHY HOUSING?

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What made housing vulnerable to a bubble? And why has the housing market been so impervious to attempts at resuscitation?

This Article critically reviews the theories of the housing bubble. It argues that housing is unusually susceptible to booms and busts because credit conditions affect demand and because the market is incomplete and difficult to short. Housing market distress transmits to the macroeconomy through a balance sheet channel, a construction channel, and a collateral channel.

Housing is unique as an asset class in that it is both a consumption and investment good. It is also the largest single consumer asset and debt class. Because housing is credit-backed and such a large asset class, failure will impact the financial system itself and pull down the economy as a whole. The dual-use of housing, its ubiquity on consumer balance sheets, its highly correlated pricing, and its linkage to the macroeconomy make it a particularly painful type of asset bubble to deflate.

The credit-backed nature of housing is also the key to understanding why there was a bubble. We argue that the bubble must be understood as stemming from the change in the mortgage financing channel from Agency securitization to private-label securitization (PLS). This shift enabled financial intermediaries—economic, but not legal agents of borrowers and investors—to exploit the information problems inherent in PLS for their own short-term gain. In other words, a set of agency problems in financial intermediation was the critical factor in fomenting the housing bubble.

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INTRODUCTION

Five years after the bubble burst, the US housing market is still in disarray. Delinquencies and foreclosures, while slightly down, are still at near record levels. Near a quarter of mortgagors remain underwater on their properties. Fannie Mae and Freddie Mac are still in conservatorship and the private-label securitization market is dead. Even with record low interest rates, originations and new home construction are anemic.

There is little sign that the situation will soon change, with neither the Administration nor Congress pushing major housing policy initiatives. Indeed, it could well be said that the United States currently lacks a housing policy. For years, housing policy was clear: increase homeownership. This simple directive helped gloss over the lack of coordination in housing policy, which is splintered among numerous agencies: HUD (for low-to-moderate income households), FHFA (for middle income households), the bank regulators (for high income households), the Federal Reserve Board (for interest rates), the VA, the CFPB (for consumer protection), as well as state and local housing agencies. Now, however, it is not clear whether the goal of housing policy should be to maximize homeownership, to maintain homeownership at a particular level, to facilitate rental stock, to

encourage single-family or multi-family construction, to encourage green and transportation-accessible development, etc.

Similarly, there is no clear policy on how to deal with the housing bubble's legacy problems—foreclosures and negative equity—nor is there a clear policy about what to do with the broken housing finance system: What is to become of Fannie Mae and Freddie Mac? Can the private-label securitization market be revived? Will covered bonds make inroads in the United States? Will the 30-year fixed-rate mortgage continue as the standard product?

The lack of housing policy and housing finance policy should not be a surprise; we are still coming to terms with what caused the housing bubble. Until there is a clear consensus on the causes of the bubble, it is unlikely that we will see significant action in formulating a housing policy; any housing policy must account for the lessons of the bubble.

Still, in making sense of the events of the past several years, it is necessary to start with a fundamental question: Why housing? What made housing vulnerable to a bubble? And why has the housing market been so impervious to attempts at resuscitation?

This Article critically reviews the theories of the housing bubble. It argues that housing is unusually susceptible to booms and busts because credit conditions affect demand and because the market is incomplete and difficult to short. Housing is also unique as an asset class in that it is both a consumption and investment good and as an investment good, purchase frequently requires borrowing. Because real estate lending is based on appraised values, higher housing prices justify more credit, enabling the unsustainable upward price spiral to which all forms of asset-based lending are vulnerable, as Veblen (1904) observed.

Because homeowners are generally both occupants and borrowers the result, when a residential mortgage fails is a foreclosure and eviction for the owner-occupant. The result adds to housing inventory. This problem does not exist for other asset classes, such as commercial mortgage, where the mortgagor is usually not the occupant, and foreclosure does not result in an increase in commercial real estate inventory through an eviction. The foreclosure-eviction outcome is not only socially disruptive to families and neighborhoods, but also potentially disruptive of the economy because it causes housing price volatility, which can impair household and financial institutions' balance sheets.

Because housing is credit backed and the most important asset and debt on households' balance sheet, and because the financial sector is itself leveraged, widespread mortgage defaults will impact the financial system itself, potentially pulling down the economy as a whole. The dual-use of housing, its ubiquity on consumer balance sheets, its highly correlated pricing within and across markets, and its linkage to the macroeconomy through the balance sheet channel, construction channel, and financial sector collateral channel make it a particularly painful type of asset bubble to deflate. It is also a difficult asset bubble to deflate because of the inherent limits to arbitrage. When prices get out of line with fundamentals, it is not possible to sell homes short (meaning selling homes one does not own with the aim of purchasing them at a lower price prior to delivery on the first sale).¹

While housing may be uniquely susceptible to bubbles with deep social and economic consequences, the housing bubble did not simply happen on its own. In our view it was a man-made, rather than a market-made event. We argue that the bubble must be understood as stemming from the change in the mortgage financing channel from Agency securitization to private-label securitization (PLS). This shift enabled financial intermediaries—economic, but not legal agents of borrowers and investors—to exploit the information problems inherent in PLS for their own short-term gain. In other words, we see agency problems as lying at the heart of the housing bubble.²

The shift in the financing channel was possible only because of the artificial demand created for the junior, riskiest tranches of private-label securitizations via resecuritization using collateralized debt obligations (CDOs). The CDOs were essentially a manufactured, captive source of demand for the most concentrated risk in the housing market. This artificial demand enabled financial institutions to unsustainably expand the market and profit from the expansion. The explanation of the bubble we present, then, is a story of an “inside job,” in which some parts of the financial services industry (and their shareholders at the time) did very well—for a short time, even if the bubble was ultimately disastrous for many of the firms that helped create it.

¹ Selling standardized mortgage-backed securities (MBS) and financial derivatives backed by the collateral is of course possible if there is a market in which these assets trade, as discussed *above*.

² In other work, we lay out in detail the role information problems played in the bubble and how agency conflicts in mortgage finance enabled the exploitation of these information problems. (Levitin & Wachter, 2012, at <http://ssrn.com/abstract=1669401>; Levitin, Pavlov & Wachter, 2012, at <http://ssrn.com/abstract=1970288>.)

The Article proceeds as follows. Section I reviews the literature on the causes of the housing market boom and bust, with an emphasis on recent work in this burgeoning area of inquiry. Section II sets forth what we believe is the most cogent explanation for the bubble. Section III then considers the social nature of housing and its links to the macroeconomy. A conclusion discusses the implications for housing and housing finance policy going forward.

I. THE BUBBLE IN THE LITERATURE

Was there a bubble? And, if so, when did it start? As John Cochrane (2011) has recently said: “Crying bubble is empty unless you have an operational procedure for distinguishing them from rationally low risk premiums.” Could we have seen it coming? And if so, was it avoidable? Or will bubbles always take us by surprise?

A. Bubble Denial

Part of the bubble literature denies that there even was a bubble or at least contends that it was and is not identifiable as such. At the time of the housing price run-up, some, including Federal Reserve Chairman Alan Greenspan (2004) argued that housing prices were being driven by fundamentals and, in fact, that housing could not be subject to a bubble because frequent buying and selling of homes is not possible. While few, if any, would make Greenspan’s argument today, there are subtler versions of the fundamentals argument that are in fact plausible. The fundamentals in question derive from the financing of housing, rather than the demographic and income driven demand side or physical supply side issues (although they may play a role as discussed below).

The supply of capital is critical to housing since its purchase and sale must be mediated by financing given the size of the purchase and its long life as a consumer durable. Low interest rate environments, and, specifically, low yield spreads over Treasury rates, automatically result in higher asset prices (based on the increased value of the imputed rent or other cash flow from the asset). In the canonical model, asset prices are formed based on current and expected yields and current and expected cash flows; lower yields mirror higher asset prices.

Based on this, there is an argument within the paradigm of the Efficient Market Hypothesis (EMH) that justifies the declining yield spread and subsequent rise in housing prices during the 2000s as the outcome of rational behavior by market participants, rather than a bubble. Such an argument has been made in a recent paper by Favilukis, Ludvigson, and Van Nieuwerburgh (FLV) (2012), which suggests that in

the boom period, households became better able to smooth their consumption due to financial market liberalization and technological gains, thus reducing the risk in the economy and the risk of investments. Investors could therefore accept a lower rate of return for riskier assets, resulting in a price rise and in the declining yield spread and simultaneous proliferation of risky, expensive real estate products.

FLV distinguish their explanation of credit expansion and price rises based relaxed credit constraints due to technology advances from Bernanke et al. (2011)'s "global savings glut" explanation. Bernanke et al., argue that a surplus of savings from emerging market countries was invested in "safe" US assets, namely Treasuries and Agency securities. The influx of emerging market capital displaced US and European investors, who invested instead in other AAA-rated assets, especially structured financial products like private-label MBS (PLS) thereby creating a surfeit of financing that lowered mortgage costs and enabled prices to be bid up.

FLV, however, conclude that the increased access to credit is not consistent with Bernanke et al.'s global savings glut argument because the inflow of foreign capital would reduce the supply of safe assets available to American investors. A reduced supply of safe assets would increase American investors' exposure to riskier assets and therefore result in *higher* yield spreads. As higher yield spreads did not occur, FLV conclude that there could not have been a global savings glut. Critically, FLV's argument assumes a constrained supply of "safe" assets, a point we take up later in Part II.

The basic set of facts that FLV and others observe and attempt to explain is the rise in credit and housing prices and decline in credit constraints and in required yields. Which of these is cause and which is effect? The burgeoning macro literature uses structural vector error correction models to test for which came first. A number of recent empirical papers attempt to disentangle whether the decline in credit constraints caused price rises or whether price rises caused a decline in credit constraints. They find a "mutual dependence" between credit and housing prices. (Anundsen & Jansen 2012; Berlinghieri, 2010; Oikarinen, 2009a; Oikarinen, 2009b; Sophocles & Vlassopoulos, 2009; Fitzpatrick & McQuinn, 2007; Gerlach & Peng, 2005; Gimeno & Martinez-Carrascal, 2010; Hoffman, 2004; Hoffman, 2003).

A conceptual base for this mutual dependence is established by Adrian and Boyarchenko (2012), which presents a theory of financial intermediary leverage cycles. The interaction among production,

financial intermediation, and household sectors amplifies fundamental shocks that affect the real economic activity. Financial intermediaries' leverage is procyclical because of risk-sensitive funding constraints. Therefore, financial intermediaries produce greater output and consumption growth and less consumption volatility than they would with constant leverage, but they do so at the cost of systemic risk.

The fact that credit constraints declined and impacted housing prices in the bubble years is not in question as part of the story, although evidence is for a bidirectional causation. The historical increase in volume and share of subprime as well as other non-traditional mortgage finance is clear. As Table 1 shows, there was an unprecedented expansion in aggressive mortgage lending during the bubble years, although we should note that these aggregate data are only recently available, and were not available in real time in the expansionary period. These data do not show what still is not known: the layering of risk on individual loans and the extent of missing or inaccurate or fraudulent information.

Table 1. Decline in Underwriting Quality During Bubble³

Sector	Year Issued	Avg Loan	ARM	Interest Only ARM	Interest Only FRM	Negative Amortization	FICO	LTV	CLTV	Piggyback	Full Doc	WAC
AltA	Pre2005	\$240,729.31	48%	24%	2%	11%	709	74%	77%	15%	31%	6.27
AltA	2005	\$285,178.79	71%	32%	8%	32%	712	74%	79%	31%	29%	5.34
AltA	2006	\$317,050.44	71%	30%	11%	36%	710	75%	81%	40%	18%	6.50
AltA	2007	\$360,667.35	66%	39%	14%	32%	713	75%	80%	36%	18%	6.90
AltA	2008	\$456,839.34	93%	55%	2%	29%	725	73%	76%	24%	28%	6.92
Prime	Pre2005	\$412,684.19	40%	20%	0%	0%	732	68%	69%	5%	62%	6.07
Prime	2005	\$494,833.63	65%	48%	5%	0%	740	69%	71%	20%	55%	5.42
Prime	2006	\$566,814.87	53%	46%	13%	0%	741	70%	73%	25%	49%	6.18
Prime	2007	\$616,609.88	45%	38%	19%	0%	742	71%	75%	30%	47%	6.24
Prime	2008	\$708,515.75	51%	44%	11%	0%	748	71%	74%	19%	54%	6.63
Subprime	Pre2005	\$142,176.27	69%	6%	0%	0%	616	80%	81%	8%	66%	8.08
Subprime	2005	\$180,000.15	81%	26%	1%	0%	627	81%	85%	23%	59%	7.24
Subprime	2006	\$188,385.23	80%	18%	1%	0%	626	81%	87%	29%	56%	8.11
Subprime	2007	\$199,223.96	73%	14%	2%	0%	625	82%	86%	21%	57%	8.31
Subprime	2008	\$232,583.03	17%	4%	11%	0%	616	78%	78%	2%	59%	8.50

Moreover, a recent paper by Barakova et al. (2012) directly tests for the extent of credit constraints in this period and finds that credit constraints associated with income and with poor credit quality history declined significantly from 2004 through 2007 and that these declines were associated with price rises in the markets in which they occurred. Other work also demonstrates the simultaneous expansion of credit and rise in prices over time and space. Mian and Sufi (2009) find that ZIP codes with a larger expansion of the supply of mortgage credit experienced more rapid increases in house prices and subsequent

³ Fitch RMBS Performance Metrics.

defaults, even though these ZIP codes had lower income and employment growth. Pavlov and Wachter (2006) similarly find, in an 18-country cross-section analysis, that countries with greater “underpricing” of credit experienced much deeper asset market crashes.

Taken as a whole, this empirical work supports explanations where credit expansion and price rises occurred together and with causation going both ways. This is of course consistent with the stylized facts of an increase in credit availability, a decrease in yield spreads, and a rise in housing prices. These empirical data, however, do not answer the Cochrane question, namely whether there is an operational way to distinguish between a bubble and a rational decline in the cost of capital consistent with the FLV’s EMH market explanation. In other words, was the increase in housing prices the result of a disinnovation or an innovation and could this be known in real time?

C. Bubble Agnosticism

Another stream of post-crisis literature is epistemologically agnostic. It contends that it is impossible to operationally distinguish between bubbles and rationally based asset price increases. There may or may not have been a bubble, but we simply cannot tell. Foote, Gerardi, and Willen (FGW), for example, specifically argues that the price increases in the 2000s could not and still cannot, in retrospect, be identified as a bubble. They also identify a number of factors, including securitization and the originate-to-distribute mortgage lending model and government affordable housing policies that they believe are not responsible for the bubble. They argue that the evidence is against these possible explanations for housing price inflation during the boom years. Instead, they assert that the only explanation consistent with the available data was that there was a “mass delusion,” (Neyfakh, 2012) and because it was a mass delusion, it was inherently neither detected nor detectable—in other words, the housing bubble is beyond explanation—it is the economics of the ineffable.

As it stands, detecting a housing price bubble is necessarily a joint test of the validity of the model identifying the bubble and of the actual existence of the bubble. A claim of a bubble is always subject to a critique of an incomplete model, although such a critique never touches on whether there is in fact a bubble but rather focuses on the inadequacy of the model and the fact that there are likely to be other fundamental forces which if they were known could complete the model and thus explain the run-up in housing prices.

FGW in fact points to the unwillingness of those economists' whose models pointed to pervasive positive errors to call a bubble. FGW also points to the active trading of MBS and specifically asserts that there was rich information available about the pricing of individual mortgages and individual MBS. FGW, however, does not consider credit characteristics, in aggregate, which are at least potentially knowable. A bubble cannot be identified from a sampling of loans, such as the information for particular deals, which is what FGW notes was available to investors in the 2000s. But to understand the impact of credit on housing prices, it is necessary to know the aggregate supply of credit and the attributes of that supply, not merely anecdotal information on individual loans or samples. Aggregate data is necessary to model the impact of a potential change in credit and economic conditions on future credit availability and therefore on the performance of mortgages, including not only mortgages that require refinancing, but also those mortgages potentially impacted by an increase in foreclosure rates.

Aggregate data would be necessary to identify a bubble. It would, however, have been an impossible task to aggregate the terms of the loans being underwritten in the US mortgage market in the 2000s given the heterogeneity of those loans. Even now it is not possible to know in aggregate the layering of risk and the loan level corruption of information that was transferred to deal tapes. Absent standardization of products and exclusion of niche products to minimal market share, it is not possible to aggregate rate and term information for the market. In earlier work, Pavlov and Wachter set forth an empirical test for a bubble. The Pavlov-Wachter test looks to the correlation of compressed lending terms (low risk premia) on standardized mortgages, with otherwise unexplained asset price rises. (Pavlov & Wachter, 2006; Pavlov & Wachter, 2004). When such correlation occurs, there is a heightened risk that a credit-based bubble is forming, and the associated empirical analysis predicts *ex ante* a deeper asset price crash in the presence of such a correlation.

Levitin, Pavlov and Wachter (2012) show this finding holds for commercial real estate markets because investors are diversified; for residential housing markets, the relationship holds when low risk premiums are associated with increased risk in the financing offered. In the commercial market, only compression of lending terms is necessary

for a bubble, but in the residential market, lower risk premia are not in itself necessarily a sign of a bubble.⁴

The question for residential markets, then, when a price rise is accompanied by a decline in the cost of credit, is whether the price rise is due to technological innovation lowering the cost of capital and default risk or to a mispricing of risk. The identification that risk was increasing during the bubble period even as the cost of credit declined and its availability increased is potentially revealed by the nature of the credit extended.

The credit that was extended during the bubble could not have smoothed life cycle expenditures as FLV (2012) argue, because it was extended in a form that would result in heightened payment shock, namely the adjustable rate mortgage. The preponderance of credit that was extended in this period was in the form of adjustable rate mortgages. Many had teaser rates that would adjust after a couple of years, with prepayment penalties for refinancing at the period of adjustment. Many others were interest only loans (requiring a balloon payment), or negatively amortizing loans (increasing debt loads).

Thus, although it is theoretically plausible that overcoming credit constraints can result in consumption smoothing, such an explanation is inconsistent with the facts of the bubble. Credit constraints were being overcome not by a technological innovation (which, in any case, remains unidentified by the proponents of EMH theories of the bubble) but by more prosaic moves to riskier credit and the abandonment of traditional lending criteria.⁵

Still, the inconsistency between a consumption smoothing explanation and the prevalence of adjustable rate, balloon, or negatively amortizing products only poses the question of why prices would not accurately reflect risk. Why would the cost of credit decline when risk is increasing? Why would prices not accurately reflect risk? The answer, we believe, is in the shift in the structure of financial products, both at the consumer level—mortgages—and at the investor level—mortgage-backed securities. Both derive from the incompleteness of housing asset markets, which was then compounded by opaque derivative markets.

⁴ Commercial investors will be diversified and this is diversifiable risk, so they should not be getting a premium for this risk. If there is a compression associated with a price rise in commercial real estate, then there is a bubble.

⁵ A candidate for the technological innovation could have been automated underwriting. However, automated underwriting failed to predict performance of an aggregate book of business when terms shift, much as Lucas (1976) theorized.

D. Bubble Believers

A wide range of works in the literature accepts that there was a bubble, but provides very different explanations for the bubble. These include demand-side explanations about exuberant consumer and investor expectations about future price increases (Shiller 2000, 2008; Akerlof and Shiller, 2009) or inelastic housing supply in certain markets (Glaeser, Gyourko and Saiz 2008) and supply-side explanations about government affordable housing policies (e.g., Wallison FCIC Dissent, 2011), price-rise-induced credit deterioration (Coleman, LaCour-Little and Vandell 2008) and monetary policy (Taylor 2009; Bernanke et al., 2010). We review these explanations in detail in other work and show that they are at best incomprehensive and sometimes inconsistent with the known facts. (Levitin & Wachter 2012).

II. THE INSIDE INSIDE JOB

A. The Shift to Private-Label Securitization

We believe the key development behind the bubble was the loosening of credit standards enabled by shift in the mortgage financing channel from Agency securitization to private-label securitization. This shift was accompanied and necessitated by a change in mortgage products, from traditional fully-documented, long-term, fully-amortized fixed rate mortgages to adjustable rate, balloon, and negatively amortizing products with limited documentation of ability to repay.

It is important to note that the financial technology involved in the shift in the financing channel were not new innovations. Private-label securitization, CDOs, and the originate-to-distribute (OTD) business model had all existed for decades, as FGW notes. What was new however, was the emergence of these technologies from being niche products to becoming the market. In 2001, private-label securitization, consisting of jumbos as well as subprime and alt-A, constituted 21% of the MBS issuance. In 2006, private-label constituted 56%. (FHFA 2010). The bubble was the not the result of financial innovation per se, but of the mass use of niche products. The OTD business model using PLS and CDOs to distribute mortgage credit risk to investors was the defining feature of the bubble.

B. A Tale of Two Booms

Why did the shift in the financing channel occur? To understand the dramatic growth of private-label securitization, it is necessary to

return to 2001. In 2001, following the bursting of the Internet bubble, the Federal Reserve dropped interest rates to historic lows. Predictably an orgy of mortgage refinancing ensued. 2002 remains a record year for mortgage refinancing activity. Virtually all of the refinancing activity was of prime, fixed-rate mortgages being refinanced into lower rates. The refinancing boom generated tremendous revenue throughout the mortgage industry. By 2003, however, revenues were waning, as pretty much everyone had refinanced; we estimate that in the range of 90% of all mortgages were refinanced in 2001-2003. In order to keep up origination volume, and hence revenue, the mortgage industry had to expand the borrower base. It did so by lowering underwriting standards and by turning to niche products that had greater initial affordability. The problem, however, was that Fannie Mae, Freddie Mac, and Ginnie Mae would not securitize these products. The financing had to come from somewhere, and that somewhere was private-label securitization.

The single most distinguishing feature of private-label MBS is that they are tranching for credit risk, as well as interest rate risk. The overwhelming majority (>90%) of private-label MBS were AAA-rated at issuance, but deals always included a number of junior tranches, some investment-grade, some not (we refer to these junior tranches collectively as the B-piece). In order for a securitization to be economically viable, it is necessary to sell all of the tranches, not just the AAA-tranches. Someone must own the risky pieces. Put another way, when a pig is slaughtered, it's necessary to sell not just the ham, bacon, and loins but also the trotters, snouts, and unmentionables.

This presented a complication because while there is a vast, seemingly endless appetite for AAA-rated securities, there is a far more limited market for junior securities, particularly, non-investment grade. Bernanke et al. (2010) have shown that the global savings glut resulted in a massive influx of capital from Asia and the Middle East to US markets. Most of this global savings glut capital was invested in Treasuries and Agency securities; very little went into MBS. The global savings influx drove down yields on Treasuries and Agencies and displaced US and European investors. Other than Treasuries and Agency securities there are relatively few options for investing in AAA-rated securities. Only a handful of corporates or sovereigns have an AAA-rating. Yet there were over 60,000 structured products sporting an AAA seal. The global savings glut thus drove US and European investors to invest in AAA-rated MBS.

If the supply of AAA-rated assets were constrained, as FLV (2012) assumes they must be, then the global savings glut would have

ultimately reduced the supply of safe assets available to US and European investors and therefore resulted in higher yield spreads. But the nature of structured finance is that “safe” assets can supposedly be manufactured wholesale out of junk assets. Thus as Lloyd Blankfein, CEO of Goldman Sachs noted, “In January 2008, there were 12 triple A-rated companies in the world. At the same time, there were 64,000 structured finance instruments . . . rated triple A.” (Blankfein, 2009). The alchemy of structured finance was a “disinnovation” that ensured that the global savings glut did not push up yield spreads, as the supply of investment vehicles expanded with demand.

AAA-rated investors are primarily institutional investors that are simply looking for safe assets; for most AAA-investors, the purchase was of the rating, and as long as housing prices were rising, there was even less incentive to care about information, as rising prices made deals safer. A Wisconsin school district’s retirement fund, for example, or a Norwegian pension plan, simply lacks the capacity to do a meaningful investigation of the underlying credit risk in an RMBS and has to rely on informational intermediaries such as rating agencies, whose incentive problems have been well-documented. (e.g., Coffee, 2010). As Gary Gorton (2009) has observed, there is an insatiable market demand for informationally insensitive assets. That is what AAA-rated assets purport to be, which explains the demand for the AAA-rated private-label MBS.

C. Enter the CDOs

As we have observed in earlier work, Bernanke’s global savings glut story is incomplete, because it doesn’t explain who purchased the junior tranches of the MBS or why. AAA-rated MBS tranches can only be created if there are junior tranches. So who was buying the junior tranches, sometimes referred to as the “B-piece”?

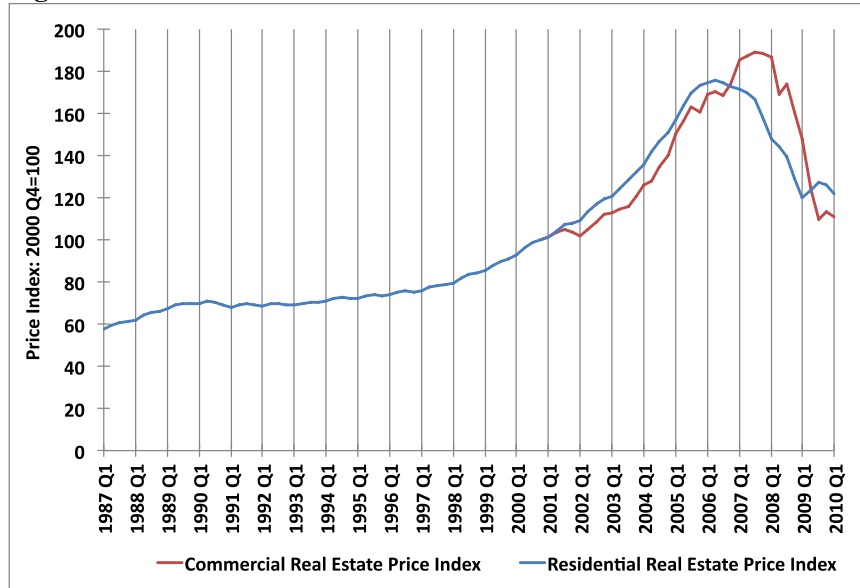
The answer is the CDOs. (FCIC, 2011, p. 155). There were some hedge fund purchasers as well, but a large percentage of junior tranches of private-label RMBS wound up resecuritized in CDOs. (Cordell et al., 2012.) As James Grant noted in 2006L

Mortgage traders speak lovingly of ‘the CDO bid.’ It is mother’s milk to the ABS market. Without it, fewer asset-backed structures could be built, and those that were would have to meet a much more conservative standard of design.

(Grant, 2006). CDOs are essentially close-ended hedge funds—unregulated investment pools with a limited investment purpose. One would expect subordinated debt buyers like CDOs to be particularly diligent in investigating credit risk. Indeed, traditional B-piece buyers in private-label deals (residential and commercial) were extremely careful about credit risk. They would obtain loan-level data about proposed pools pre-sale and actually kick out individual properties that they did not want in the pool.

Starting in around 2004, CDOs simply outbid traditional B-piece buyers for the junior tranches, meaning that the CDOs were willing to take the junior tranches even with a lower yield, resulting in cheaper mortgage credit being made available. We have found the same phenomenon to exist in the commercial real estate market, where, excluding multi-family, it is an entirely private securitization market. The first-loss position in commercial mortgage-backed securities (CMBS) was traditionally held by a small number of sophisticated “B-piece” buyers. Beginning in 2004, these B-piece buyers were outbid by CDOs. With the advent of the CDO in the CMBS B-piece market, underwriting standards declined precipitously, resulting in a bubble that closely tracks the housing bubble. (See Figure 1.)

Figure 1. Commercial and Residential Real Estate Bubbles⁶



Why did the CDOs underprice for risk? In part CDOs were created by the major securitization sponsors in order to create a more robust B-piece market. The CDOs and then CDO²s and CDO³s were essentially a giant daisy chain that collapsed before it went through numerous iterations. Whereas a typical daisy chain scam involves assets being flipped repeatedly at ever-inflated marks between the daisy chain’s participants, thereby artificially boosting the assets’ market value, the CDO daisy chain involved continuous handoffs to newly created entities. Given how short-lived the bubble was, the CDO daisy chain did not require very many iterations.

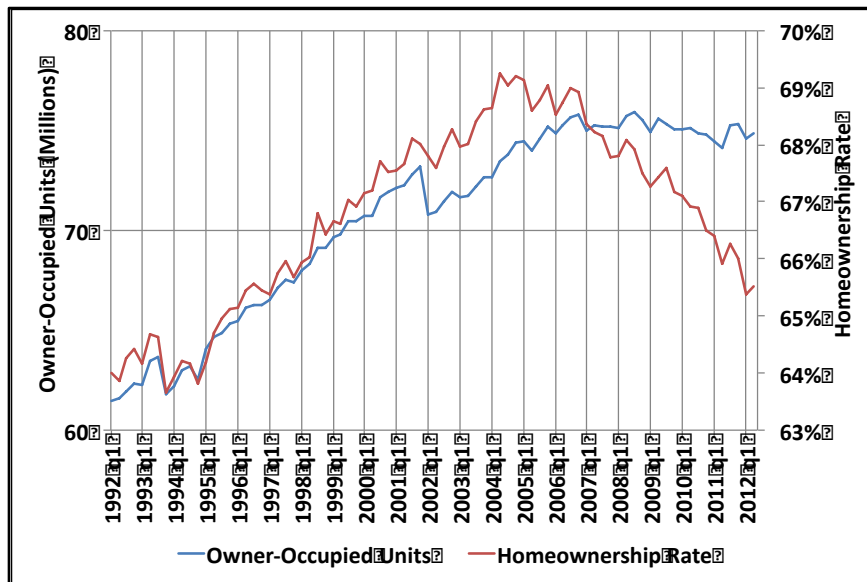
Moreover, CDOs were beset by a principal-agent problem. CDO managers had little (and declining) skin in the game, resulting in terribly skewed incentives, as CDO manager Wing Chau, infamously described in Michael Lewis’s *The Big Short*. (Lewis, 2010.) The CDO manager is guaranteed compensation based on assets under management, so the risk-averse CDO manager will simply increase assets under management, rather than seek asset quality. Moreover, in some cases, such as the infamous Magnetar deals, the CDOs’ own B-piece investors were encouraging the CDO to invest in the *worst* possible assets because the

⁶ S&P/Case-Shiller Housing Price Index CS-10 (residential price index); Moody’s/REAL Commercial Price Index (commercial price index).

B-piece investors had a much larger short position on the CDO. (Eisenger & Bernstein, 2009.) While generating fees in the CDO business required some pipeline and warehousing, this pipeline and warehouse risk could be hedged through credit default swaps (provided cheaply by AIG and others) which themselves were mispriced given their large counterparty risk, as discussed below.

Critically, it did not take a huge volume of CDOs to generate an enormous volume of AAA-rated MBS. Every dollar of CDO investment was leveraged into perhaps 10 times as much MBS investment. The CDOs financed the B-piece and with the B-piece sold, it was easy then to sell the investment-grade A-piece. The result was an enormous amount of underpriced housing finance that enabled homebuyers to bid up housing prices...as long as the borrower pool could grow at a sufficient rate. There are a limited number of potential borrowers; many people simply have no interest in homeownership, regardless of the ease of credit. As Figure 2 shows, homeownership rates peaked in 2004, but the absolute number of homeowners continued to grow during the bubble. The rate of growth slowed starting in 2006 and turned negative in 2007. Without a sufficient growth in the number of homeowners, the bubble was not sustainable.

Figure 2. Homeownership Rates and Numbers



The mispricing that produced the bubble, then, was the result of a principal-agent problem that exploited the informational opacity and fragmentation of interests in private-label securitization. While there was information available to investors on a deal-by-deal basis, as FGW notes, it was not necessarily the right type of information. Investors could obtain loan-level information about deals pre-sale, but doing so typically required a small payment. While experienced B-piece buyers were aware of this, the post-2004 B-piece buyers were often unaware or if aware simply did not care since their interest was in the fees generated and they could hedge pipeline and warehouse risk with credit default swaps. Irrespective, loan level information on individual deals was simply not the right sort of information for identifying a bubble. No one had a model for how millions of new types of loan products with novel underwritings would interact on national housing prices. Instead, what was necessary was market-wide information. And no one had it in real time.

The savvier investors were, however, aware that underwriting standards were deteriorating, even if they could not determine by how much. As noted above and as we have described in other work, it is difficult to short real estate, however.⁷ (Levitin & Wachter, 2012). It can only be done indirectly, by shorting homebuilders or REIT stock or the like or through illiquid derivative instruments like credit default swaps. Short positions are expensive to maintain, however, so a short needs to know not only that there is a bubble, but also have an idea of *when* it will burst. Otherwise the short might go broke before it can cash in.

The best method for shorting the housing market was to purchase credit default swap (CDS) protection on MBS. Typically, this CDS protection was sold by synthetic collateralized debt obligations (CDOs), making the CDO the long swap counterparty. The synthetic CDO market was miniscule prior to the bubble, with less than \$10 billion in deals between 1999 and 2004. Between 2005 and 2007, however, over \$191.5 billion of synthetic CDOs were issued (Cordell et al. 2012), indicating that there was substantial money betting on the collapse of the housing market. Indeed, while it is often asserted that everyone believed that housing prices would continue to rise, there is little actual evidence of optimism from institutional investors. Some analyst reports, such as

⁷ Without reliable short pressure, housing prices are set by optimists at the margin, creating fertile ground for Shiller's "exuberant" investors. Even a very short period of optimism, such as in 2004-2007, can lead to an incredibly painful housing bubble.

those cited in FGW indicate hope that price declines would stabilize, but that is a far cry from expecting continued appreciation.

Synthetic CDOs compete with regular MBS to attract investors who are long on housing; investors can arbitrage MBS and synthetic CDOs. The more vigorous the short investors were, the greater protection premiums they were willing to pay the synthetic CDOs, which enabled the synthetic CDOs to offer higher yields to investors. To compete, MBS could offer higher yields through making riskier loans. This was obviously not a sustainable equilibrium, but in the short term, the shorts fueled the bubble.

Our inside job explanation of the bubble is also consistent with the timing of the bubble. Dating the bubble is critical to being able to evaluate explanations of the bubble. We can rule out factors that occurred either substantially before its start or after its start. For example, changes in government policy years before the start of the bubble are unlikely to be causes of the bubble. Surprisingly, we are unaware of any work besides our own that attempts to date the bubble. In prior work we have pegged the start of bubble to late 2003 or early 2004 after inflation-adjusted home prices deviate upward from rental price indices and interest rates lose their explanatory power for the deviation. Levitin & Wachter (2012). Late 2003/early 2004 is precisely when the shift in mortgage product types and mortgage financing channels occurred, suggesting that the shift in products and financing was driving the bubble.

D. Didn't the Insiders Get It Wrong?

FGW makes the most sustained attack on the inside job theory. They argue against twelve “myths” about the bubble, several of which are relevant to the inside job theory. FGW contends that the financial products that marked the bubble had been around for years, that there was a great deal of information available to MBS investors, who understood the risks involved with their investments and were universally optimistic about prices. They also argue that the insiders were the biggest losers and the outsiders were the biggest winners, and that most AAA-MBS have not yet incurred any losses.

We disagree with FGW on many (but not all) of the so-called myths they identify. As we have explained, it was not the novelty, but the expanded use of niche products that marked the bubble. MBS investors theoretically had access to deal-specific information, but lacked a market-wide view, which meant they could not analyze borrower and economy interactions. Whether the investors understood the risks

involved and partook in the Pollyannaism obviously varies by investor. It is clear that many investors (as in the entire \$191 billion synthetic CDO short position) did not share in the supposedly universal optimism. Certainly there were many unsophisticated institutional investors like rural school district pension plans. Indeed, had investors truly understood the risks, they would have demanded greater premia.

Moreover, the investors who assumed the most risk were the CDOs, where principal-agent problem resulted in entirely warped behavior. Not surprisingly, as FGW observes, then, the losses on initially AAA-rated securities were primarily in CDOs, not MBS. Without the CDOs, however, there would not have been AAA-rated MBS and thus there would have been much less mortgage credit available, thereby constraining risk.

What about how insiders and outsiders fared? Certainly many insiders did poorly: Bear Stearns, Countrywide, Lehman, Wachovia, WaMu all failed, for example. The biggest winner, hedge fund manager John Paulson, was a mortgage outsider. The insider-loser/outsider-winner criticism is off base and hardly a scientific examination of winners and losers and why they won or lost. From even a cursory glance, however, it is clear that there is a more complicated story. First, some “insider” institutions came out poorly; others, such as JPMorgan, Goldman Sachs and PIMCO, did not. Second, for highly leveraged institutions that are reliant on having massive liquidity, even small mistakes can be fatal. Third, the criticism envisions large financial institutions for well-coordinated monoliths. They are not, as FGW acknowledges:

Why didn't the mortgage analysts tell their coworkers how sensitive the CDOs would be to a price decline? This question goes to the heart of why the financial crisis occurred. The answer may well involve the information and incentive structures present inside Wall Street firms. Employees who could recognize the iceberg looming in front of the ship may not have been listened to, or they may not have had the right incentives to speak up. If so, then the information and incentive problems giving rise to the crisis would not have existed between mortgage industry insiders and outsiders, as the inside job story suggests. Rather, these problems would have existed between different floors of the same Wall Street firm.

(FGW at 25).

The mortgage securitization desk is separate from the CDO desk, which is separate from the derivatives desk, which is separate from the trading desk. The securitization and CDO desks may well have understood what shoddy products they were selling, but as Citigroup CEO Charles Prince put it, when the music's playing you have to keep dancing. The financial institutions, such as JPMorgan, that stayed away from the worst excesses saw their share price punished for not being on the bandwagon (Bratton & Wachter, 2010). Why would the securitization desk want to tell the trading desk to stop buying MBS and thereby shut down their own business? Human capital is moveable. The true insiders—the securitization and CDO desks—pulled an inside job not just on outsiders, but on their own firms as well. In other words, agency problems were responsible for the bubble as agents (legal or economic) took advantage of their informational advantages over principals, particularly through the complexity and opaqueness of financial instruments.

III. THE SOCIAL NATURE OF HOUSING

A. The Economic Importance of Housing

The macroeconomic literature has pointed to housing's relation to the growth and stability of the economy. For example, Leamer (2007) finds residential investment—and therefore the housing market—to be a predictor of recessions. As Leamer observes, "Housing IS the business cycle." However, a *financial* transmission mechanism between the housing market and the macroeconomy remains an understudied research topic.

Housing is the single largest connector between consumer balance sheets and the rest of the economy. No financial asset class is more deeply embedded in the real economy than housing. Home equity is the primary source of wealth for the vast majority of households and represents the bulk of their net worth. In this recession, the average American household lost 40 percent of its net worth, the vast majority of which was in the form of home equity. (Mui, 2012) Housing wealth alone is nearly equal to all non-housing wealth for US households. Consumers spend more on housing than on any other single type of consumption, and housing is traditionally the major household asset, an asset almost always funded by debt. Credit constrained households borrow more when credit is easy and less when credit is tightened, thus creating a financial accelerator.

Unlike other sectors, the housing sector, directly impacts wealth and the ability to borrow. Asset-based borrowing fueled the housing bubble. (Adelino et al., 2012; Pavlov & Wachter 2011). When the bubble ended, the decline in housing prices decimated households' accumulated assets as a spending base, and also as a base against which to borrow. This damage directly affected the macro-economy through three transmission mechanisms: the balance sheet channel, the construction channel, and the collateral channel.

First, lower home prices reduce the value of assets on household balance sheets, which results in lower spending and deleveraging, particularly, as underwater borrowers reduce their borrowing. (E.g., Dynan, 2012; IMF, 2011; Mian & Sufi, 2011; Mian et al., 2011). Second, construction activity halts, and related jobs disappear. Third, declining home prices and mortgage defaults negatively impact the financial system's capital, which directly affects banks' willingness to lend. Financial institutions own whole mortgages, mortgage-backed securities, and derivatives whose value is tied to the price and solvency of real estate assets. When prices decline, asset values decline, which calls into question financial institution's solvency. Distress in the financial markets then accelerates decline in housing prices as credit markets contract. This circular mechanism—linking asset prices to firm solvency, to investment decisions, and back to asset prices—was identified in the 1980s as a “financial accelerator,” most commonly used to explain widespread bank insolvencies during the Great Depression. (Bernanke, 1981; Bernanke, 1983; Bernanke and Gertler, 1989.) Through this financial accelerator, a housing bubble built on leverage can impact far more than housing, and can trigger a financial crisis that affects the macro-economy.

The intersection of housing and the financial sector also makes a nationwide housing collapse self-reinforcing through the financial sector impact. Unable to refinance because of negative equity, tightened credit standards, or frozen markets, borrowers may be stuck with loans that they cannot (or will not rationally) repay, resulting in defaults that damage the very institutions refusing to issue them new loans as well as inducing further declines in prices through market wide effects as well as specific effects on neighboring properties.

In the response to the financial crisis in the US, the Federal Reserve greatly eased monetary supply through its “quantitative easing” programs, with the goal of lowering the cost of credit and controlling the deleveraging and decline in asset values. Yet despite the lowest interest rates and most affordable housing in postwar history, access to new

mortgages continues to be limited, as banks attempt to rebuild balance sheets and remain chary of all but the best credit quality borrowers. As John Williams, President and CEO of the Federal Reserve Bank of San Francisco, recently pointed out, “Credit market frictions make refinancing and other housing activity less responsive to changes in interest rates.” (Williams, 2012). Last year, for example, the *Wall Street Journal* reported, “the nation’s 10 largest mortgage lenders denied 26.8% of loan applications in 2010, an increase from 23.5% in 2009.” According to their analysis, these restrictions have lasted longer following this recession than they had following previous postwar recessions. (Timiraos & Tamman, 2011).

B. Default Spirals

While housing can transmit distress to the macro-economy through the balance sheet, construction, and collateral channels, distress can also be transmitted through the housing sector. Mortgage defaults trigger their own downward spiral. The distinguishing characteristic of owner-occupied housing is that foreclosure results in the borrower being put out of the home, thereby increasing the supply of housing. The excess supply can be significant given the slow growth in demand. For example, a 5% foreclosure rate is equivalent to three-to-five years of normal household formation. Thus the excess supply weighs down housing prices, causing further foreclosures in an on-going spiral.⁸

All of these factors—from the direct effects of declining house prices to the indirect effects of panic and self-fulfilling dynamic—depress consumer confidence and reinforce growing expectations of negative growth. Weak consumer confidence therefore became its own self-fulfilling prophecy, potentially setting off another vicious cycle, with the potential of a growing shadow inventory plus the large number of homeowners who are underwater. Thus the dynamic of falling prices increasing demand and decreasing supply—the normal path to equilibrium—does not hold.

No other asset class has this far-reaching and destabilizing effect on the economy. The usual stabilizing impact of price declines increasing demand and thus settling on a market clearing price is here

⁸ Regional clustering of foreclosures makes the effect more marked. Agarwal, et al. (2012) found that a 1% increase in foreclosures in a given region increased the odds of default for surrounding homeowners by 2.9%. Concentrated foreclosures can produce lasting blight. Foreclosed properties fall into a state of disrepair when the owners leave, casting a pall on the neighborhood that depresses surrounding house prices.

reversed: downward price cascades increase supply through foreclosure which leads to further price declines. Commercial real estate does not create such an upheaval, as commercial foreclosure still allows tenants to provide income during distress, whereas residential foreclosure requires a change in ownership and therefore a crisis of abandoned properties, unsold inventory, and increased possibility of fraudulent or negligent mortgage servicing.

C. Housing Externalities

Moreover, distress in residential real estate has particularly negative externalities in the form of social disruption. Unlike other assets or commercial real estate, the resolution of failed residential mortgage securities requires the displacement of the owner-occupant. Evictions strain communities and families, exacerbating unemployment, inequality, and public health. (Gelpern & Levitin, 2009). The last severe foreclosure crisis in American history—the Great Depression—was characterized by a sharp rise in homelessness, etched in our collective memories by urban squatter settlements known as “Hooverilles” and memorialized in the travails of Steinbeck’s *Okies*.

Our current upheaval is so great that contemporary accounts refer to it as “the end of the American dream.” Notions of wealth building through homeownership have been severely damaged, as years of accumulated wealth has disappeared with the decline of home prices. The effect has been particularly severe in communities of color, which traditionally have concentrated their already more limited wealth in real estate.

The political impact of housing cannot be overlooked either. The importance of housing from a social standpoint in terms of household wealth and community as well its connection to the macro-economy means that the housing market will inevitably be bailed out when it gets in trouble. It should be no surprise that the government has supported the housing market in a range of ways, from the bank bailouts to borrower relief programs like HAMP and HARP to the open-ended conservatorship and financing for Fannie Mae and Freddie Mac.

While there is been political reluctance to support individual homeowners, the infrastructure of the housing finance market will always be guaranteed, implicitly or explicitly because housing is too central to society. A failure of the housing sector means a failure of the financial sector, and massive macroeconomic consequences. It is not credible to believe that the government will not take whatever steps are necessary to protect the infrastructure of the housing finance market,

which is necessary to maintain basic stability of the housing market, the macroeconomy, and society. Housing is too-big-to-fail.

CONCLUSION

As we write, it is now five years since the bubble burst, but there is no clear direction in US housing policy. Indeed, it is hard to say what US housing policy is or whether there even is currently a housing policy. While unfortunate, this is not surprising; we are still coming to terms with the bubble and trying to divine its lessons. Nonetheless, three responsive changes can be identified in the thinking on housing, namely turns

1. a turn in policy toward sustainable homeownership and away from homeownership per se;
2. a turn towards modeling the nexus between the credit cycle and housing; and
3. a consideration of the appropriate role of macroprudential policy and other collective action responses to this potentially destabilizing nexus.

For us, there are three fundamental lessons that must be taken from the bubble. First, the housing market is uniquely vulnerable to credit-fueled bubbles. Second, deflation of housing bubbles is likely to have wide-ranging macroeconomic and social effects. And third, the government will support the housing finance market because it is necessary to protect the market's infrastructure in order to stave off even worse macroeconomic or social consequences.

The risk of bubbles, their consequences, and likelihood that government will bear part of the costs all mandate the careful regulation of housing finance. We have already started down this path with the reforms enacted by the Dodd-Frank Wall Street Reform and Consumer Protection Act,⁹ but the ultimate lesson from the bubble is that housing policy can no longer be divorced from financial regulatory or economic policy. Going forward, the challenge will be to reconcile our past commitments to an ownership society with our new commitments to economic stability and sustainability. It is time to move toward this new policy equilibrium.

⁹ The Dodd-Frank Act created additional regulatory requirements for mortgage loan origination; created a new agency (the Consumer Financial Protection Bureau) with industry-wide authority to regulate mortgages; imposed risk-retention requirements for certain securitizations; and created a macroprudential regulation structure.

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