A PROPOSED MORTGAGE TO HELP AVOID ANOTHER HOUSING BUBBLE

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ABSTRACT

The massive housing bubble of the first five years of the 21ˢᵗ Century that impacted many nations, and the subsequent collapse of housing prices created massive losses for investors in the mortgages written on homes for which the homeowners subsequently defaulted, or who otherwise failed to keep current on their mortgage payments.

Lax mortgage underwriting standards, combined with overly optimistic rating agency evaluations of securities backed by mortgages, helped inflate the bubble, and increased the subsequent losses suffered by investors. This laxness was not confined to only new, so-called "subprime" mortgages, but also first mortgage refinancings as well as second, third, and even fourth mortgages.

Five years after housing prices began to decline, the domestic USA housing market has still not bottomed-out. Mortgage modification programs have been a resounding failure, while attempts by lenders to foreclose on properties in default have proven difficult to complete. Add in the slow recovery of the USA economy and high levels of unemployment, sales of existing homes and construction of new homes remain at historic lows.

This paper recommends several changes to the mortgage underwriting process to reduce the likelihood of a future housing bubble, and changes to the foreclosure process should another bubble occur. To reduce the likelihood of a future bubble, this paper recommends the establishment of mandated dual appraisals on certain mortgage loans. In addition to the customary "sales comparables" appraisal, the paper recommends a second, income-based appraisal to establish the value of the property should the borrower face financial distress. In those circumstances where the income-based appraisal is lower than the sales comparable appraisal, only that portion of the mortgage supported by the lower appraisal is considered "conforming" while any mortgage amount above that supported by the income-based appraisal is considered "non-conforming."

To cope with defaults that occur (as a result of a burst housing bubble, or for any other reason), the paper recommends the inclusion of an "owner-to-renter" option on certain mortgage loans. This option would permit the lender to convert a borrower in default to a renter in lieu of formal foreclosure proceedings. In essence, the borrower would return title to the lender in exchange for a lease on the home at the prevailing fair market rent.

Keywords: Mortgages, subprime lending, default, foreclosure, housing bubble, underwriting.

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Introduction

The international housing bubble of the first half of the first decade of the 21st Century, followed by its subsequent collapse, has created massive financial losses for mortgage lenders as well as dislocations and bankruptcies for millions of homeowners. Continued, persistent declines in housing prices in many national economies have been exacerbated by ineffective, if well-meaning, efforts, to provide assistance to homeowners in actual foreclosure as well as homeowners who are otherwise likely to default at some future time.

Like the tech (or "dot com") bubble of the late 1990s, the housing market lacked natural mechanisms to moderate the creation and inflation of a bubble. Unlike other markets, there were few ways for most people to profit from the inevitable bursting of the bubble, or to protect themselves from the bursting of the bubble. Homeowners could not "short" their houses, i.e., sell to another party with the promise to buy them back at some future time. Absent action by central banks to slow the expansion of the bubble (the US Federal Reserve Bank held interest rates at historically low levels well into 2004), housing markets were infected with the same fever that swept the tech bubble. Ironically, it was former Federal Reserve Chairman Alan Greenspan who presided over the easy money policies that helped inflate both the tech bubble and the housing bubble [Ahearne, et. al (2005)], [Schwartz (2009)], [Taylor (2009)]. Greenspan had previously characterized the tech bubble as "irrational exuberance" but sought to distance Federal Reserve policy from any effect on either bubble.

Several other factors contributed to the housing bubble. One was the widespread use of subprime lending to homebuyers who did not qualify for "prime" loans. Amplifying this risk was the use of adjustable rate mortgages (ARMs) to finance many subprime mortgages. A typical subprime ARM was the 2/28 Hybrid which had a low, "teaser" interest rate (and payment) the first two years, with a substantial increase in the interest rate (and payment) beginning the third year [Hendershott, Hendershott and Shilling (2010)]. Pennington-Cross and Ho (2010) find that the 2/28 Hybrid ARM was the most common mortgage in the subprime market. Due to its low initial rate, the goal of the subprime borrower was to get out of the 2/28 mortgage before the interest rate was reset higher. Pennington-Cross and Ho conclude that this mortgage product made the mortgage market much more sensitive to house prices, equity extraction, and interest rates. Ambrose, Lacour-Little and Huszar (2005) find that the time period when a loan converts from a fixed rate to an adjustable rate is associated with a substantial and permanent increase in the likelihood of default. Worsening the situation, Posey and Yavas (2001) note that asymmetric information leads high default risk borrowers to choose ARMs. Coulibaly and Li (2009) report that two-thirds of all subprime mortgages were ARMs. Pavlov and Wachter (2011) find that the marketing of aggressive mortgage products magnifies the real estate cycle on the upside. On the downside, aggressive mortgage products magnify the real estate cycle even in the absence of increases in defaults and foreclosures. Keys, et. al. (2010) find that securitization practices adversely affected the screening incentives of subprime lenders.

The problem extended beyond the credit histories of borrowers in the subprime market. Many of these borrowers were also weak in the sense that they were first-time homebuyers who lacked experience in executing transactions. Once in financial distress and unable to make their mortgage payments, they were also in a weakened bargaining position. Genovese and Mayer (1997), Miceli, Sirmans and Yavas (2001), Anglin, Rutherford and Springer (2003), and, Harding, Knight and Sirmans (2003) all find that weak buyers pay higher prices for their homes and weak sellers receive lower prices for their homes.

The tepid performance of equity and debt markets also caused a shift in consumer behaviour. After the decade of the 1990s when common stock returns and bond returns were substantial, the early 2000s saw equity prices nose-dive. Subsequent central bank actions to lower interest rates sent bond yields plummeting. Many consumers responded by allocating larger and larger sums to housing in the hopes of offsetting lower expected returns in equities, bonds, and other, more traditional investment vehicles with higher returns in their housing assets [Zandi (2009)].

Finally, the regulatory regimes of many countries failed to adequately monitor and discipline government (and quasi-government) housing finance entities. For example, despite numerous warnings that two US Government-Supported Entities (GSEs), namely Fannie Mae and Freddie Mac, were accumulating vast amounts of risky mortgage loans, the US Congress took no steps to rein in these GSEs' lending practices [Roubini and Mihm (2010)].

The Gross Rent-Price Ratio

Regardless of what factors may have caused the housing bubble in the United States, the effect became quite clear by the early 2000s: housing prices were rising much faster than rents. Figure 1 illustrates the Gross Rent-Price ratio for owner-occupied housing in the United States. The entire time series uses data from the Federal Housing Finance Agency (FHFA - solid line), while data from Case-Shiller-Weiss is added beginning in the year 2000 (CSW - dashed line).[1]

After two decades of a relatively stable relationship, the ratio began a slow - followed by a precipitous - decline beginning in the late 1990s. The ratio fell below 4.50% in 2002 (the lowest ratio since 1960 when this data was first tracked) and continued to fall into the first quarter of 2006 to a low of 3.10% as estimated using CSW data, and 3.57% as estimated using FHFA data. As Gallin (2008) notes, while real rents rose less than 20% between 1998 and 2006, real house prices rose 50% over the same time period. Unlike past time periods when a declining Gross Rent-Price ratio may have been a signal of higher expected future rents (see Clark [1995], for example), the declining Gross Rent-Price Ratio of the early 2000s was consistent with an overvaluation in the housing market [Leamer (2002)]. In contrast to previous declines in the ratio (late 1970s and late 1980s), however, the subsequent reversal in the ratio, beginning in the latter half of 2006 was due to a substantial decline in housing prices, rather than a combination of lower rates of housing appreciation and higher rates of rent increases. In other words, as the bubble inflated (and then burst), there was almost a complete disconnect between housing price changes and rent changes.

Figure 2 reinforces this by plotting the Case-Shiller US Housing Composite Price Index (seasonally adjusted) together with the US Census Bureau Owner Equivalent Rent Survey. The OER survey explicitly asks homeowners what they believe someone else would pay to rent their home. Clearly between 1999 and 2006, home prices rose at a substantially faster rate than the rate of increase in what homeowners perceived they were worth as rental properties.

Figure 1. Gross Rent-Price Ratio, US Stock of Owner-Occupied Housing, 1978-2009.
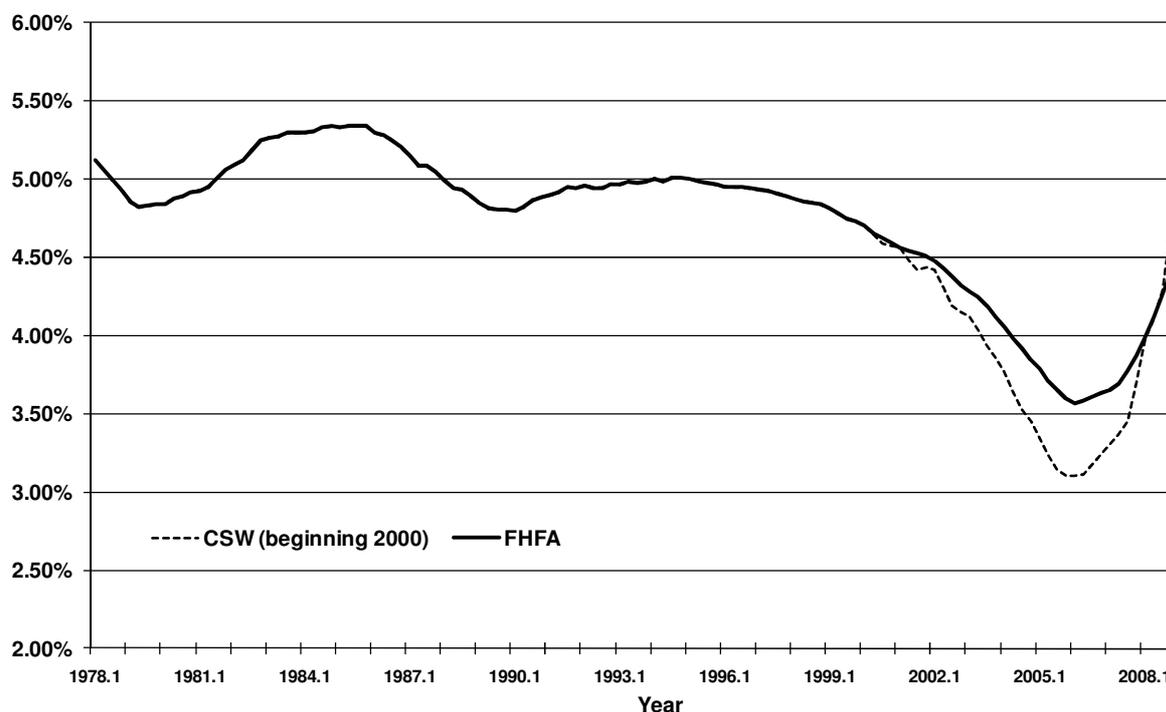
Figure 2. US Housing Prices (Seasonally Adjusted) and Equivalent Rents, 1995-2009 (1995Q1 = 100).
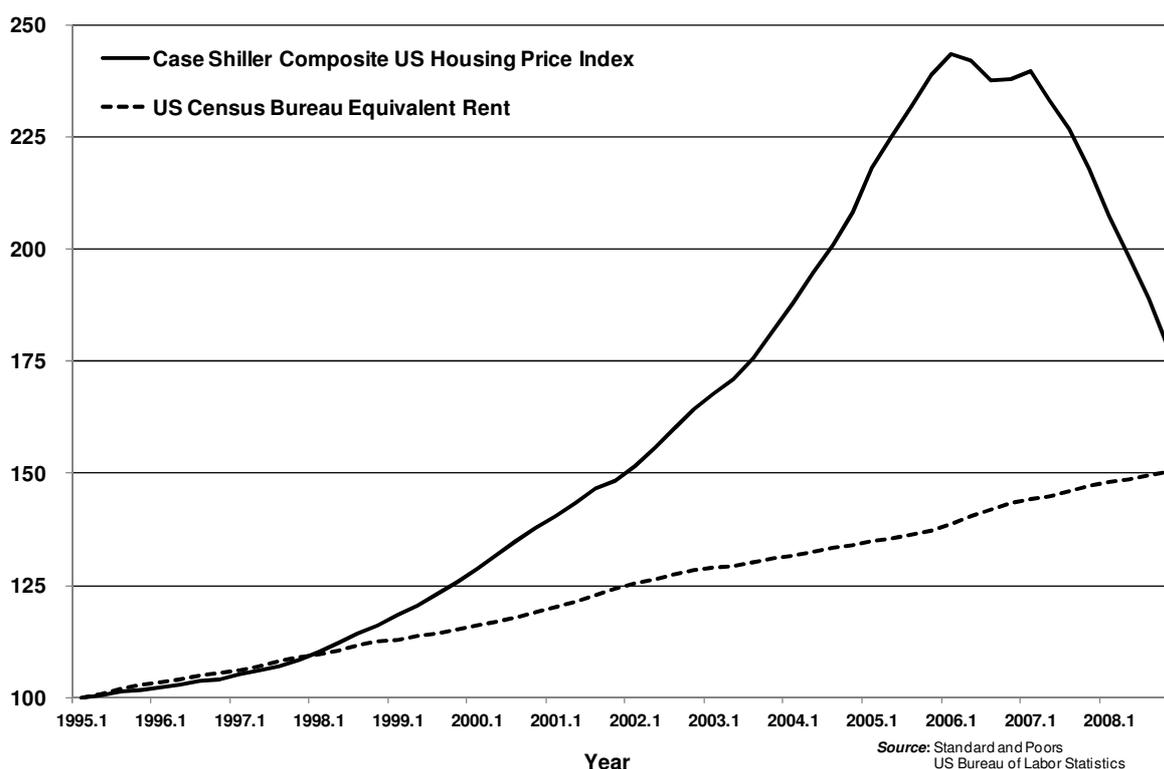
As the Gross Rent-Price ratio declined, and as home prices rose much more rapidly than their equivalent value as rental properties, mortgages written to borrowers who originally represented some risk of default due to "normal" risk factors such as lack of other tangible assets, job instability, divorce, etc. became substantially riskier. Absent a combination of continued increases in housing prices, low mortgage interest rates, and ready access to mortgage refinancing, the entire housing finance structure faced collapse.

This is best illustrated in Table 1 which shows the relationship between the annual debt service (principal plus interest) on a self-amortizing, 30-year mortgage as a function of the mortgage interest rate and loan-to-value (LTV) ratio at origination. For example, at a mortgage interest rate of 5.25% and a LTV ratio of 90%, the annual debt service is 5.96% of the purchase price of the home. Should that borrower face some form of financial distress, at a Gross Rent-Price ratio of 4%, vacating the home and converting it to a rental property would represent a substantial loss for the borrower (and, most likely, subsequently the lender) as the gross rent would cover only about two-thirds of the debt service. And this is before adding other home ownership expenses like property taxes, hazard insurance, and periodic maintenance.

Table 1. Annual Debt Service on a 30-Year, Self-Amortizing Mortgage (as percent of Purchase Price).

		Mortgage Interest Rate										
		4.00%	4.25%	4.50%	4.75%	5.00%	5.25%	5.50%	5.75%	6.00%	6.25%	6.50%
	80%	4.58%	4.72%	4.86%	5.01%	5.15%	5.30%	5.45%	5.60%	5.76%	5.91%	6.07%
	85%	4.87%	5.02%	5.17%	5.32%	5.48%	5.63%	5.79%	5.95%	6.12%	6.28%	6.45%
LTV	90%	5.16%	5.31%	5.47%	5.63%	5.80%	5.96%	6.13%	6.30%	6.48%	6.65%	6.83%
	95%	5.44%	5.61%	5.78%	5.95%	6.12%	6.30%	6.47%	6.65%	6.83%	7.02%	7.21%
	100%	5.73%	5.90%	6.08%	6.26%	6.44%	6.63%	6.81%	7.00%	7.19%	7.39%	7.58%

Widespread homeowner financial distress also had the potential to exact a toll on other homeowners as neighbourhoods were destabilized and homes deteriorated due to neglect. Destabilization of neighbourhoods, and deteriorating properties led to the prospect of lowering other, nearby home values, creating a "domino effect" in which financial distress on the part of a few homeowners could spread like a contagion throughout an entire neighbourhood, even an entire community.

The Costs of Default and Foreclosure

The process of taking a delinquent homeowner through default and foreclosure is both time-consuming and expensive. Depending on the jurisdiction (in the US, state law governs default and foreclosure rules), the time frame from initial default to the point where the lender actually seizes the home can range from several months to two years or more. Most states permit a delinquent homeowner a grace period (pre-foreclosure) in which to redeem the property (become current on past due payments) before the lender may initiate foreclosure proceedings. Many states also permit a statutory right of redemption by the homeowner even after the foreclosure process has been completed. In the United States, one critical factor in lengthening the foreclosure process is a variety of class action legal challenges which have caused many lenders to delay initiation, or execution of foreclosures. RealtyTrac (2011) reports, however, that after a year of declining foreclosure filings, foreclosure filings have begun to increase in the second half of 2011.

Another key factor in the length of time it takes to foreclose is whether the home is in a "judicial foreclosure" or "power of sale foreclosure" state. Judicial foreclosures are processed through the courts while power of sale foreclosures are not processed through the courts. Hayre and Saraf (2008) note that foreclosures take an average of 11 months in power of sale states, while foreclosures take an average of 14 months in judicial foreclosure states. Pennington-Cross (2003) found that foreclosed homes in judicial foreclosure states sold for four percent less than homes in power of sale states, even adjusting for changes in market conditions. Mian, Sufi and Trebbi (2011) note that, between 2006 and 2009, home prices fell 43% in power of sale states where foreclosure activity was much greater than in judicial foreclosure states where lenders, for various reasons, were much more hesitant to initiate foreclosure proceedings. In judicial foreclosure states, home prices fell 28%.

The lender's default and foreclosure (actual and potential) costs may be separated into five categories. The first is the lost mortgage principal due to default; the second is the direct administrative and legal costs of taking a borrower through default and foreclosure; the third is the (potential) loss in value of the property during default and foreclosure due to adverse market conditions; the fourth is the loss in value of the property due to deterioration caused by homeowner neglect (e.g., failure of the homeowner to make timely repairs), subsequent damage caused by homeowner neglect, or outright acts of damage or theft during the foreclosure process; and, the fifth is the (potential) loss in value associated with selling a (now) vacant home.[2] A report issued by the Joint Economic Committee of the United States Congress (2007) estimated that the total cost of a typical foreclosure was approximately 77,000 USD, of which the lender's cost was approximately 50,000 USD. By contrast, the same report estimated the cost of preventing a foreclosure at approximately 3,300 USD.

Crews and Merrill (2008) report that, in the US, the foreclosure process currently lasts an average of 354 days between the due date of the last payment made and the loss of the home at the foreclosure sale. They also report that the costs associated with foreclosure rise significantly with the length of the foreclosure timeline; by as much as 12 percent for every 50 days added to the timeline.

Most mortgage defaults are triggered by a perception on the part of the borrower that their mortgage (or mortgages, in toto) is (are) "underwater" or "upside down." That is, their total principal indebtedness exceeds the market value of their home. Even if the borrower is able to immediately sell their home, the lender faces a loss of principal. CoreLogic (2011) reports that, as of the end of the second quarter of 2011, 10.9 million US homeowners (22.5%) had negative equity in their homes. More than 4 million homeowners are "underwater" just in the states of California and Florida.

The direct administrative and legal costs encompass the actual, out-of-pocket costs incurred by the lender in default and foreclosure which includes accrued interest. In addition, the lender is exposed to other costs. For example, a borrower who has failed to make their mortgage payments in a timely fashion is not making their property tax and hazard insurance payments either. To protect their interest in the property, the lender will have to keep current the property tax payments to avoid liens being placed on the property by counties, municipalities, and school districts. The lender will have to make the hazard insurance payments to protect against losses due to fire, theft, or natural disasters.

During the foreclosure process, the lender may be exposed to adverse market conditions. Since the foreclosure process delays the sale of the property, the property's market value may decline, further eroding the lender's interest. Several studies [Shilling, Benjamin and Sirmans (1990)], [Forgey, Rutherford and Van Buskirk (1994)], [Springer (1996)], and [Carroll, Clauretie and Neill (1997)] all found that foreclosed homes sold at a discount. Meanwhile, a borrower in the foreclosure process is not likely to adequately maintain, or make timely

repairs to the property, accelerating the deterioration of the property. Recognizing the (now) lack of equity interest in the property, the homeowner may fail to protect the home against damage, or engage in acts that damage the value of the property. Clauretie and Daneshvary (2009) studied the "stigma" effect of foreclosure on housing resale prices in Las Vegas. They separate the "stigma" of foreclosure from proxy effects such as deteriorated physical condition, or neighbourhood effects. They find that previous estimates of the foreclosure discount are about one-third higher than the "true" discount caused by foreclosure itself.

Finally, after foreclosure is completed and the borrower is evicted, the lender is faced with the prospect of reselling a now vacant home. Numerous studies [Turnbull, Sirmans and Benjamin (1990)], [Asabere and Huffman (1993)], [Sirmans, Turnbull and Dombrow (1995)], [Springer (1996)], and [Turnbull and Zahirovic-Herbert (2011)] have shown that vacant homes sell at a substantial discount relative to occupied homes. They generally conclude that this is due to two principal factors: 1) a vacant home does not "show" as well as an occupied home; and, 2) a vacant home is often interpreted as a signal that the seller is "motivated" which reduces the seller's bargaining power. Lee (2011) finds that the cumulative effects of neighbourhood foreclosures were non-linear. That is, as foreclosures increased, the impact on neighbourhood property values increased non-linearly.

The costs to the lender may be non-trivial in all of these five categories, and cumulatively, could represent substantial losses for the lender.

A New Mortgage Product

The combined effects of housing prices rising substantially faster than rents, and the expensive and time-consuming process of taking a borrower through default and foreclosure suggest that traditional residential mortgage products may be much riskier than most originators, rating agencies, and secondary mortgage market buyers perceive them to be. As the past several years have shown, throughout the world, this underestimation of risk is especially acute when housing prices decline precipitously after a bubble and remain depressed for a long period of time. Even "prudent" borrowers and lenders suffer in such an environment as the effects of default and foreclosure spread across local, regional and national boundaries.

What is needed is a mortgage product that moderates (largely) speculative increases in housing prices, and provides both lenders and borrowers with some relief from the costs of default and foreclosure. Such a mortgage is suggested here.

Moderating House Price Inflation through Dual Appraisals

The previous discussion points clearly to a single factor which helped inflate past housing bubbles, and could inflate future housing bubbles. In the absence of strong central bank action to moderate rapid, large run-ups in housing prices, there are few self-correcting mechanisms to temper an overheated housing market. Further, as the cost of owning a home financed by a mortgage rapidly exceeded the cost of renting a home, new homebuyers found themselves without a Plan B. That is, in the event that a homeowner found it impossible to continue to make their full mortgage payment, they were not in a position service that mortgage debt by vacating the home and renting it to someone else. Market rents, having risen much more slowly than housing prices, were not large enough to service the mortgage debt. That left the homeowner with only Plan C: default on the mortgage.

A possible, self-correcting mechanism is to require that the prospective borrower obtain two distinct appraisals on the home for which they are seeking a mortgage under certain circumstances. Most likely, this would be circumstances where the borrower's credit score falls below some threshold level, or, where other borrower risk factors may be present. Lenders may also want to pay attention to the characteristics of the property itself. Bourassa, et. al. (2009) studied repeat sales in three New Zealand cities and found that atypical properties, especially in urban neighbourhoods, represent significantly higher default risk.

In addition to the customary sales comparison appraisal (which estimates the home's value based on similar, recently-sold, nearby homes), the borrower would be required to also obtain an income appraisal which estimates the home's value based on the cash flow achieved as a rental (rather than owner-occupied) property. Obtaining an income appraisal in addition to a sales comparison appraisal should not be difficult. Home rental markets tend to be active even when home sales markets are thin. However, one example of where it may be difficult to get a solid income appraisal is in areas where virtually all homes

are owner-occupied. In the US, these are typically high-end communities. Another example is where the subject property may be a condominium in a development where the homeowners' association actively discourages, or heavily regulates, rental activity.

Sales comparison appraisals rely strictly on the absolute level of the sales prices of similar, nearby, recently sold homes regardless of whether those prices are in equilibrium, or, in the case of a bubble, disequilibrium. Basing a lending decision on a sales comparison appraisal only serves to sustain the disequilibrium in housing prices as sales comparisons appraisals echo other, potentially over-priced transactions. By adding an income appraisal, the lender and borrower can develop a sense of the potential disconnect between a home's value as owner-occupied, and the home's value as a rental property. In a housing bubble, the rental value may be substantially less than the owner-occupied value.

Obviously, the requirement of an income appraisal in addition to a sales comparison appraisal would represent an additional cost which would most likely be borne by the borrower. The borrower and lender need to exercise care in selecting an appraiser who has the educational qualifications, professional qualifications, and experience to perform both a sales comparison appraisal and an income appraisal. The appraiser's knowledge of the locality's home sales and home rental markets is crucial.

Consider a subject property on which a sales comparison appraisal and an income appraisal are both performed. Call the estimated value using sales comparisons, V_C, and the estimated value using the income method, V_I. Now assume that $V_C > V_I$. If the lender's mortgage guidelines permit them to loan a maximum percentage of the property's appraised value (the loan-to-value ratio, or LTV), then clearly $LTV*V_C > LTV*V_I$. If we call the maximum permitted mortgage amounts $L_C = LTV*V_C$ and $L_I = LTV*V_I$, and $(L_C - L_I) = \Delta L_{CI}$, then, in those mortgage originations where the lender believes there is an unacceptably high probability the borrower may default on any loan amount in excess of L_I, the lender may then choose to only loan an amount equal to L_I. In that case, the borrower would have to come up with a higher down payment (the additional amount being ΔL_{CI}). As many borrowers would be unable to fund the higher down payment amount, unambiguously, fewer mortgage originations, and hence, fewer home sales, would occur - particularly in an overheated market.

In fact, the frequency with which loans would not be consummated would be directly correlated with the level of housing price disequilibrium. That, alone, would reduce the likelihood of a housing bubble occurring in the first place as housing prices would naturally revert toward their values as income properties.[3]

Suppose, though, that a lender still chose to originate an actual loan amount (L_A) equal to L_C (or any amount in excess of L_I, for that matter). In that case, the dual appraisals would be attached to the final, executed mortgage and promissory note so that, if the originating lender chooses to sell the mortgage into the secondary mortgage market, there would be transparent disclosure to any prospective buyer of the mortgage of the relationship between L_A and L_I. Given the additional default risk of a loan in excess of L_I, the entire mortgage loan would have to be priced to generate a higher yield than a mortgage written for an amount equal to L_I. The result would be a higher interest rate on the mortgage, increasing the borrower's monthly payment. That would reduce the number of consummated mortgages which would, again, reduce the likelihood of a housing bubble.

For buyers of these mortgages who would then bundle them together and sell securities against them, two distinctly separate securities could be written: one security backed by the "conforming" mortgage amount, i.e., L_I; and another security backed by the "non-conforming" mortgage amount, i.e., $(L_A - L_I)$. The security backed by the "conforming" amount could have a priority claim on principal payments in the event of default or foreclosure - clearly signalling the risk differential between the two securities. Feedback on the differential yield pricing of these two securities would assist mortgage originators in setting the risk premium on any mortgage written for an amount in excess of L_I.

Requiring both a sales comparison appraisal and an income appraisal would provide additional useful information for both prospective borrowers and lenders, and for both ARMs and fixed-rate mortgages. A prospective borrower, especially a first-time homebuyer, may have no idea what the rental value may be of the home they wish to purchase. The income appraisal would help them gauge whether the price they have offered for the home is too high. Since most mortgage contracts are subject to the appraised value at least equalling the agreed-to sales price, the addition of an income appraisal would give many homebuyers the opportunity to nullify their sales contracts. Real estate brokers, now aware of the requirement of an income appraisal, can communicate this to home sellers in setting the offering prices on homes. This

would be particularly useful for homes on the lower end of the price spectrum, and for homes with idiosyncratic characteristics.

For ARMs, particularly those with an initial "teaser" rate, the income appraisal permits the prospective borrower and the lender to engage in a conversation about the likelihood of borrower distress when the ARM adjusts to a higher interest rate and, hence, higher monthly payment. Unless the borrower's income rises sufficiently to service the higher payment, the only options may be to vacate the property and rent it to someone else, or go into default. If the rent is insufficient to cover the payment, default is inevitable.

Income appraisals, like sales comparison appraisals, are subject to estimation error. While a property's near term cash flow is fairly predictable, estimates of long term cash flows are subject to a host of assumptions about both microeconomic changes (local rental property supply and demand, changes in property taxes, and changes in utility costs, for example), and macroeconomic changes (the level of mortgage interest rates, for example). Also, the estimated value is critically dependent on the rate at which future cash flows are discounted (the discount rate) and capitalized (the cap rate). Finally, the estimated value of an income property is dependent on assumptions about the appreciation rate of the property. During a bubble, appraisers may estimate larger rates of appreciation - even in the absence of rent increases - which would increase the appraised value.

The dual appraisal methodology would be useful in mortgage financing activities beyond new, first mortgages. It could be especially helpful when an existing homeowner is applying for a second mortgage of a fixed amount, or for a home equity line of credit (HELOC) that permits the homeowner to borrow up to a specified amount. In the case of HELOCs, many lenders in the US currently do not require even a formal sales comparison appraisal, much less an income appraisal.[4] Numerous studies including Anderson, Capozza and Van Order (2008), Cordell, et. al. (2008), and, Hendershott, Hendershott and Shilling (2010) document the substantial additional leverage that existing homeowners assumed as the bubble inflated. Most of this additional leverage was achieved through second mortgages and HELOCs. First mortgage loan-to-value ratios changed very little as the bubble inflated.

The dual appraisal methodology could also be used for existing HELOCs as a tool to periodically adjust the maximum line of credit (cap) as housing prices (and rents) change. To the extent that increases in housing prices do not reflect increases in rental costs, the dual appraisal methodology would deter increases in an existing homeowner's maximum line of credit, and could result in a decrease in the line of credit.

Relief from the Effects of Default and Foreclosure - the Owner-to-Renter Option

Assume that a homeowner (borrower) is facing a situation where their mortgage is "underwater." Depending on the legal statutes of the jurisdiction in which the home is located, the borrower has a period of time to "make up" the shortfall in payments - commonly referred to as the redemption period. If the shortfall is not repaid ("cured" or "redeemed") by the end of the redemption period, the borrower is in default. At this point, the lender may take legal action to recover the shortfall in payments and, if unsuccessful, the lender may then proceed to foreclose on the property.

A borrower has several options to delay or frustrate the foreclosure process. One option is to declare personal bankruptcy which gives the borrower time to reorganize and/or discharge their debts by freezing creditors' claims against them. In some jurisdictions, the declaration of personal bankruptcy may "stay" a mortgage lenders attempts to initiate foreclosure proceedings. Another option is for the borrower to request of the lender that the borrower engage in a "short sale," i.e., sell the property for a price less than the principal amount owed on the mortgage with the lender agreeing to accept whatever proceeds they receive from the "short sale" as full satisfaction of the lender's claim against the borrower.

"Short sales" are voluntary actions by the borrower and are subject to lender approval. Declaring bankruptcy is also a voluntary action on the part of the borrower, but not subject to lender approval under most mortgage contracts. However, whether the borrower engages in a "short sale," declares bankruptcy, or permits the lender to foreclose on the property; the end result is (eventually) the same: the borrower loses title to the property, must vacate the property, and suffers significant damage to their credit rating. In the United States, bankruptcy filings remain on a borrower's personal credit record for seven years.

For any given mortgage, the lender's (potential) nominal loss from default <u>and</u> foreclosure may be modelled as:

$$DFL = \rho*[(PRIN - MV_D) + LAC_D + LAC_F + (MV_D - MV_F) + TC_{DF}]; \qquad (1)$$

Where:
	DFL	=	Total Default and Foreclosure Loss;
	ρ	=	Probability of Borrower Default resulting in Foreclosure;
	$PRIN$	=	Mortgage Principal Balance at time of Default;
	MV_D	=	Market Value of (occupied) property at time of Default;
	LAC_D	=	Legal and Administrative Costs of Default (pre-Foreclosure);
	LAC_F	=	Legal and Administrative Costs of Foreclosure;
	MV_F	=	Market Value of (vacant) property at completion of Foreclosure; and,
	TC_{DF}	=	Selling and Closing (Transactions) costs of Foreclosed property.

$$MV_F = MV_D + \Delta MV_{MC} + \Delta MV_{DD} + \Delta MV_{VAC}; \qquad (2)$$

Where:
	ΔMV_{MC}	=	Change in Market Value due to Market Conditions;
	ΔMV_{DD}	=	Change in Market Value due to Deterioration and Damage; and,
	ΔMV_{VAC}	=	Change in Market Value due to property being Vacant.

ΔMV_{MC}, ΔMV_{DD}, and ΔMV_{VAC} are *negative* (*positive*) if the market value *decreases* (*increases*) due to market conditions, deterioration and damage, and the property being vacant, respectively. While ΔMV_{MC} may be positive or negative, it is highly unlikely that ΔMV_{DD} and ΔMV_{VAC} are ever positive.

For a mortgage lender, whenever ρ is non-zero, all of the costs on the right-hand side of Equation 1 come into play and must be estimated by the lender. Those costs must then be factored into the pricing of the mortgage loan either directly (in terms of a higher interest rate which reflects a risk premium) or indirectly through other mortgage provisions (such as requiring the borrower to purchase a mortgage insurance policy which would insure timely payments to the lender should the borrower default). Whatever method is chosen, the end result is the same - the borrower faces an explicitly higher borrowing cost.

Suppose, instead, the borrower conveys to the lender, at mortgage origination, an option which allows for the transfer of the deed for the property from the borrower to the lender after the borrower's statutory pre-Foreclosure redemption period has expired in lieu of the lender commencing foreclosure proceedings. In exchange for transferring the deed to the lender, the borrower is spared the foreclosure process, faces no subsequent liability for any monies owned under the mortgage, and is conveyed by the lender a lease on the property at a fair market rent. This so-called "Owner-to-Renter" or "Deed-in-lieu-of-Foreclosure" option has the potential to save the lender considerable costs.

Separating the lender's total, potential nominal cost of default and foreclosure (DFL), into its components: nominal (pre-Foreclosure) Default costs <u>with</u> the Owner-to-Renter option exercised (DL_{OTR}); and, the lender's potential *additional* nominal cost of Foreclosure (FL_{OTR}) if the Owner-to-Renter option is <u>not</u> exercised, then these costs may be modelled as:

$$DL_{OTR} = \rho*[(PRIN - MV_D) + LAC_D + TC_{OTR}]; \text{ and,} \qquad (3)$$
$$FL_{OTR} = \rho*[LAC_F + (MV_D - MV_F) + (TC_F - TC_{OTR})]. \qquad (4)$$

Where:
	TC_{OTR}	=	Selling and Closing (Transactions) costs on property if the Owner-to-Renter option is exercised; and,
	TC_F	=	Selling and Closing (Transactions) costs on property if the Owner-to-Renter option is not exercised.

Rearranging:

$$FL_{OTR} = DFL - DL_{OTR}; \qquad (4a)$$
$$= DFL - \rho*[(PRIN - MV_D) + LAC_D + TC_{OTR}]; \qquad (4b)$$
$$= \rho*[LAC_F + (MV_D - MV_F) + (TC_F - TC_{OTR})]; \qquad (4).$$

Clearly, the lender may be able to avoid substantial costs with the Owner-to-Renter option. Also, the immediate recognition of the default loss if the owner-to-renter option is exercised (and the lender liquidates the property) gives investors a clear picture of the magnitude of the loss on the mortgage. Continuing into the foreclosure process increases investor uncertainty as to the actual (eventual) magnitude of the loss. It is also likely that the Owner-to-Renter option would accelerate the adjustment of the market prices of homes, permitting housing markets to reach "bottom" more quickly.

There exist substantial positives for the borrower should they elect to convey this option to the lender: 1) the borrower receives a lease on the property avoiding the disruption caused by eviction; 2) the negative impact on a borrower's credit history and credit score may be lessened as foreclosure (and, possibly, personal bankruptcy) is (are) avoided; and, 3) borrower costs in foreclosure are also avoided. Additionally, the borrower does not have to sell the property as the deed is conveyed directly to the lender. As a result, with the owner-to-renter option, some borrowers may elect to signal financial distress in advance of actual default to explore whether the lender is interested in (pre-emptively) exercising the option. In this circumstance, in addition to avoiding foreclosure costs, the lender may also be able to avoid some default costs.

The most explicit benefit to the borrower is that, with an Owner-to-Renter option, the lender can offer the borrower more favourable terms since the risk premium on the loan is lower. Those more favourable terms could be anything from a lower interest rate to fewer discount points on the mortgage to a longer loan amortization period. In any case, the borrower is likely to see a lower monthly mortgage payment with the Owner-to-Renter option than in its absence.

There exist potential global cost savings as well. A home sitting vacant as a result of foreclosure and eviction negatively impacts the property values of nearby homes. Should a neighbourhood experience a critical number of foreclosures, the negative impact may be substantial enough to force other homeowners into default and foreclosure. In essence, defaults and foreclosures may cause a precipitous downward spiral in housing prices locally and, possibly, regionally.

For lenders, the mortgage principal lost may be reduced through the Owner-to-Renter option as the lender is able to market the property to potential investors with a lease in place. This facilitates a more accurate appraisal of the property's market value as an income property.

It is also important to note that the Owner-to-Renter option may be utilized not only in new mortgage originations, but also in modifications to existing mortgages where the homeowner is facing some difficulty (in actual default or high probability of future default). As in new mortgage originations, the Owner-to-Renter option would provide, in many cases, a sufficient incentive for a lender to modify an existing mortgage when, in the absence of the option, the lender may elect not to agree to a mortgage modification.

The Owner-to-Renter option could prove an important tool in stabilizing neighbourhoods suffering from high rates of default and foreclosure.

Designing an Empirical Test

Since the proposed mortgage instrument discussed here does not currently exist, no empirical testing is possible at present. However, should such a mortgage product become widely available, a variety of cross-sectional and time-series empirical analyses could be performed. We detail several of those tests here:

- A cross-sectional test of the default rates of the proposed mortgage instrument relative to other mortgage instruments available at the time of mortgage origination. This test would help establish whether in, in fact, as theorized, the proposed mortgage product would reduce the risk of default. The null hypothesis would be that the proposed mortgage product reduces the risk of default;

- A cross-sectional analysis of default rates of the proposed mortgage by credit quality of the borrower. This would help establish whether the default experience for the proposed mortgage is as strongly linked to credit quality as for existing mortgage instruments. The null hypothesis would be that the proposed mortgage product reduces the risk of default across borrowers of all credit qualities, and, especially for borrowers with who represent significant credit risk. If the results demonstrate a pattern

lower default rates, it would provide evidence for the possible modification of the appropriate use of the proposed mortgage viz. the borrower's quantitative credit risk;

- A cross-sectional analysis that profiles the characteristics of borrowers who elect the proposed mortgage product relative to borrowers who elect an existing mortgage product. The null hypothesis would be that the proposed mortgage product would prove relatively popular among borrowers with high credit risks;

- A cross-boundary and time-series test to establish whether the change in the level of homeownership differs in locations where the proposed mortgage product is widely available and widely chosen is different from locations where the proposed mortgage product has limited market penetration. The null hypotheses would be that: a) the change in homeownership levels would exhibit a more positive bias in areas where the proposed mortgage product is widely available and widely chosen; and, b) through time, this positive bias would become more pronounced as the market share of the proposed mortgage product increases;

- A time-series analysis of offered interest rates on the proposed mortgage product relative to existing mortgage products, especially those existing mortgage products specifically targeted to marginal-to-low credit quality borrowers. The null hypothesis is that the offered interest rates on the proposed mortgage product would be lower than on existing mortgage products;

- A time-series analysis of the secondary market pricing of securities backed by the proposed mortgage product relative to the secondary market pricing of existing mortgage products in conjunction with the previous analysis. The null hypothesis would be that the secondary market would, through time, establish the appropriate risk premium for the proposed mortgage product, and that the risk premium would be lower than that on existing mortgage products – controlling for the credit risk of the pool of borrowers;

- A time-series analysis of the default rate on the proposed mortgage product as a function of macroeconomic indicators such as income growth, GDP growth, interest rates, residential rents, and unemployment rates. The null hypothesis would be that the default rate rises with rising unemployment rates and rising interest rates, and falls with accelerating rates of growth in income, GDP and residential rents; and,

- A time-series analysis of the market share of the proposed mortgage product relative to existing mortgage products. The null hypothesis is that the proposed mortgage product would gain market share through time, Additionally, the relative market shares of existing mortgage products would be tested through time to establish the substitution effect of the proposed mortgage product. The null hypothesis would be that the proposed mortgage product would gain market share primarily at the expense of existing mortgage products specifically targeted at marginal-to-low credit quality borrowers.

Conclusion

The housing bubble of the early years of the 21st Century, and the subsequent crash in home prices have painfully illustrated the need for reforms in the mortgage underwriting process to prevent future bubbles and future crashes. It is clear that few self-correcting mechanisms currently exist to prevent future bubbles, and that the current default and foreclosure process is both expensive and time-consuming. This paper recommends two significant changes to the mortgage underwriting process that would, in tandem, substantially reduce the likelihood of future bubbles, and more effectively deal with borrower defaults.

The requirement that prospective mortgagors have both a sales comparison appraisal and an income appraisal performed on a property would provide important, additional information on the possible disconnect between home prices and rents. Such information would be valuable to prospective borrowers and lenders as well as potential secondary market buyers of new mortgages. The dual appraisal requirement would transparently aid primary market lenders and the secondary mortgage market in pricing the incremental mortgage risk associated with a housing bubble.

The Owner-to-Renter option would provide numerous benefits to lenders, and to mortgagors in financial distress. This option holds out the prospect of saving lenders substantial sums of money, as well as the time it takes to complete the foreclosure process. Distressed borrowers could also save money and have the opportunity to remain in the home after they surrender title to the lender. The benefits would extend beyond the lender and borrower as the reduction in foreclosure activity, and, consequently, the fewer number of empty homes, would be a substantial positive for neighbourhoods and communities that might be, otherwise, stigmatized by the consequences of a large number of foreclosures.

ENDNOTES

[1] The Gross Rent – Price ratio is somewhat, but not directly analogous to the rate at which income-producing property cash flows are capitalized (the cap rate). Cap rates use Net Operating Income as the numerator (gross rents less operating expenses). Hence, when a rental property incurs any operating expenses for the owner, such as property taxes, hazard insurance, maintenance, and so forth, the Net Operating Income is less than the Gross Rent - often by a substantial amount.

[2] In the US, the most common method of selling a foreclosed property is a public auction regardless of whether the home is in a judicial foreclosure or power of sale foreclosure state. In many instances, however, the lender is the only bidder, and, in competitive auctions, the lender is often the winning bidder.

[3] If the CMBS market is any indicator, Seslen and Wheaton (2010) conclude that default in income producing properties tends to become a slowly evolving game rather than a "ruthless" exercise of an option.

[4] This is due to the fact that, in the US, HELOCs are often originated by banks, and savings and loan associations. These financial institutions hold those loans in their own portfolios since HELOCs are lines of credit, not fixed amount, fixed payment loans.

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