Home Appreciation Participation Notes: A Solution to Housing Affordability and the Current Mortgage Crisis

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This paper introduces Home Appreciation Participation Notes (HAPNs), an innovative new housing finance tool. Housing is a commodity providing two distinct utilities: shelter and investment. Traditionally, buyers have had to purchase both elements in tandom. HAPNs allow buyers to purchase these elements individually. Thus, buyers can focus on purchasing housing units that best fit their shelter needs, investing in housing appreciation to whatever extent is appropriate for the needs of their investment portfolio.

HAPNs are different from previous financing tools in three key ways: there is no payment burden until ownership of the home is transferred, the risk of housing price declines is shifted to investors, and the final payoff is indexed to the appreciation rates of local housing prices. With these three features, HAPNs considerably improve the affordability of homeownership while reducing the risk of default and avoiding the moral hazard associated with shared appreciation instruments.

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HAPNs thus have important implications in today's worldwide housing and financial downturn. First, they can be used as an effective loss-mitigation tool against delinquent mortgages. Converting a delinquent traditional mortgage into a HAPN financing structure can simultaneously reduce the payment burden and the current loan-to-value ratio. This, in turn, can help to avoid default and foreclosure. They can be also useful in stimulating housing transactions during housing recessions. Because homebuyers avoid the risk of decreases in housing prices, they will be more willing to purchase homes in the face of an uncertain housing market. This feature will bolster demand for housing when it is needed most.

Keywords

Affordable housing; Home ownership; Housing financing; Appreciation; Capital gain; Risk management; Loss mitigation; Home appreciation; Participation notes

1.   Background

The housing crisis in the United States has been one of the primary causes of the current worldwide economic downturn. In response to this crisis, we have seen unprecedented recovery efforts by governments, which have been spending trillions of dollars in a desperate attempt to avoid another Great Depression. A critical focus has been on the efficient use of government funds, which is generally seen as an attempt to effect the most rapid and sustained recovery possible per dollar expended, while creating a future return for taxpayers.

In the housing sector, we have seen speculative investors over the last decade or more create housing bubbles and cause a housing shortage in some areas. As a result, housing values grew too fast, making home ownership unaffordable for many households. The rapidly rising prices enticed many others to purchase houses at unsustainable prices that they were barely able to support. Broadly marketed mortgage products made it easy for borrowers to finance homes using loans that lowered current payments while shifting more risk to the borrower than ever before (e.g., teaser rate adjustable mortgages with the potential for negative amortization).

Zero or low down payment loans allowed buyers to purchase homes with little or no equity in them. Making matters worse, there was little or no verification of a buyer's ability to repay the loan. When housing prices started falling, interest rates rose, and credit to the housing market dried up. The number of mortgage defaults rapidly increased, especially through the securitization products based on mortgages. This has resulted in many people losing their homes and their life savings. The turmoil has spread to other financial markets, as well.

In this paper, we introduce Home Appreciation Participation Notes (HAPNs) [1], a housing finance instrument that can significantly reduce mortgage default rates and increase the amount of capital available to the housing sector. As a result, they can stimulate the recovery of the housing sector.

HAPNs have several characteristics that can improve the efficiency of the housing finance market, contributing to the avoidance of a repeat of the current crisis. They can:

- Allow a better diversification of homeowner investment portfolios, markedly reducing the concentration of risk typically associated with homeownership;
- Allow the risk of house price appreciation (HPA) to be shifted away from homeowners to entities that are more capable of bearing and managing it;
- Make housing much more affordable; and
- Substantially reduce the default risk incurred by lenders.

In addition to having long-term benefits for the housing finance market, HAPNs can also play a major role in resolving the current financial crisis by providing a mechanism for working out nonperforming mortgages, avoiding default on these loans, and allowing the borrowers to maintain ownership of their homes.

Owner-occupied housing typically provides buyers with both consumption and investment elements. An owner/occupier purchasing a home obtains the consumption rights to that home, including occupancy, exclusion, and alteration rights. For most buyers, an owner-occupied home is their largest asset, their cheapest form of financing, and their most leveraged form of debt. HAPNs have been developed to allow the separation of the two elements of owner-occupied housing by allowing buyers to retain the consumption element while essentially capitalizing the investment value of the home and selling it along with its risk to another investor. The less of the investment element the buyer retains, the more affordable the house becomes. The amount of HPA risk is also lowered.

With regard to the two elements of housing, there are basically four types of homebuyers – those that:

- Want both the consumption and investment opportunities embedded in traditional house financing products;
- Want the consumption element, but would like only part of the investment element so as to diversify their investment portfolio;
- Are interested only in consumption, not in investment, perhaps to maximize the amount of housing they can consume currently; and
- Are currently renters that would like to own a home but cannot afford do to.

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[1] Patent pending.

The first type of homebuyer would presumably not be interested in HAPNs. The other three types, however, could benefit significantly from them.

We start by introducing HAPNs. We then discuss their unique features. After that, we describe how they can serve as an affordable home-buying tool and the potential role they can play in resolving the current economic crisis by allowing distressed homeowners to remain in their homes and also by encouraging house sales in the midst of a declining housing market.

2.   Introduction

A HAPN is a separate financial instrument used in conjunction with a traditional mortgage. The homebuyer sells the HAPN to a separate investor, and the proceeds from the sale are substituted for a portion of the principal amount of the homebuyer's mortgage. This reduces the amount of his or her mortgage. Thus, the homebuyer has essentially received payment for the capitalized expected HPA at the time of purchase and has transferred the risk and/or reward potential of future housing price movements to the HAPN investor.

The HAPN is essentially a zero-coupon bond. HAPN investors purchase rights to the future HPA, receiving nothing in return until the title of the house is transferred. When this happens, they receive the portion of the HPA that was purchased. If the price of the house declines (in the event of a negative HPA), they suffer that loss (up to the amount of the initial price of the HAPN).

Upon the disposition of the house, the payoff to the investor is computed based on the difference between the initial and the final local housing price index. The actual sales price of the underlying house is not used to avoid the moral hazard associated with this approach. Thus, the HAPN has an indefinite maturity based on the change in ownership of the house. It is a second lien on the house after the primary mortgage. This is a very important issue and is discussed in more detail in the next section of this paper.

HAPNs could be configured in various ways, depending on the needs of homebuyers and investors. In this paper, we use an example of how a HAPN could be configured to benefit both homebuyers and investors while at the same time fulfilling public policy objectives. With this type of HAPN, investors would assure homeowners of a 1% per year increase in the value of their homes. Investors would assume any risk or benefit depending on whether there was any deviation from this amount.

Investors would pay homeowners for this right, and the amount paid would become a bullet mortgage on the house with no associated monthly payments. The HAPN would be settled when homeowners sell their houses. If the HPA is greater than 1% per year, the investor would be paid the excess of that amount in addition to the face value of the bullet mortgage. If the HPA is less than 1% per year, the investor would

make up the difference, which would be taken out of the par value of the bullet mortgage upon the sale of the home. The bullet mortgage, thus, is a performance bond. The investor's liability for the downside loss would be limited to the par value of the HAPN.

3.   Unique Features

This section discusses the unique features of HAPNs that enhance their usefulness to homeowners and investors relative to similar instruments. We note four primary features that are unique to HAPNs:

- They rely on an index to measure HPA to mitigate the moral hazard;
- They are zero-coupon bonds;
- Investors purchasing them take the risk of housing price decreases; and
- Their maturity is tied to the sale of the house not the payoff of the loan.

3.1   The HPI is used to mitigate the moral hazard

Determining the amount of HPA to be paid to the HAPN investor is key to making HAPNs an efficient and effective instrument. Traditionally, shared appreciation mortgages (SAMs), which allow the mortgage lender to receive part of the HPA, have faced this challenge. The major problem that must be addressed is the moral hazard, which arises when the sales price is used to compute how much of the HPA is to be shared with investors. This was eloquently discussed with regard to SAMs by Shiller and Weiss (1998).

The moral hazard refers to the incentives for homeowners under a SAM contract to under invest in a home because the investor will take a percentage of the increase in value and also arrange to have the final sales price lower than it would be otherwise. If the appreciation were to be measured by an area House Price Index (HPI) instead of the appraised value or sales price, they argue, the investment that the homeowner makes in the house would not be reflected in the settlement of the SAM. In other words, it would be as if the SAM did not exist as an incentive for the homeowner.

Shiller and Weiss (2000) estimate that underinvestment with a 50-50 partnership[2] would cause the sales price to decline by 5% to 9% after eight years. Sanders and Slawson (2005) estimate that if homeowners under-invested at a rate of 5% per year, they would receive a 17% higher than expected return on their housing investment when sharing 75% of the appreciation with the lender. Thus, both Shiller and Weiss and Sanders and Slawson perceive underinvestment as a serious problem.

The use of HPIs to measure the appreciation owed to the SAM would obviate the moral hazard by making the SAM payoff independent of the value of the specific

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[2] A partnership is equivalent to the HAPN because the HAPN shares in the decrease in price.

house. One of the key features of HAPNs is the use of an index to measure the HPA to be shared with investors instead of using the selling or the appraised price of the house.

Using HPIs as an index is not without pitfalls. There is the basis risk that the change in value of the home would be different from the change in value of the HPI, and this would produce a disproportionate loss or profit for homeowners. For example, if the change in the HPI indicated that the investor was owed $50,000, but the house had actually sold for less, homeowners would be hard-pressed to make up the difference out of their own pockets. Offsetting this risk is the HAPN configuration used above whereby the homeowner is promised a 1% per year HPA. This would serve as a cushion to offset basis risk.

HPIs are readily available indices so implementation would be straightforward. Other indices, such as estimates of housing prices from Automated Valuation Models (AVMs) and "desk appraisals," would also be attractive alternatives. Not only are AVMs likely to have a lower basis risk than HPIs, there are ways to use them that would further reduce the risk. The AVM that is used for the initial estimate, for example, could be "frozen" so that subsequent refinements to the model were not used. In this way, even though the initial estimate might be low, the final estimate would be proportionately low. In this way, the HPA estimate would be unbiased.

The attributes of the house that were used in the initial AVM estimate, such as the amount of living space (a variable used in most AVMs to estimate value), could be frozen, as well. By so doing, changes such as home improvements would not be included in the final AVM estimate. This would allow the homeowner to reap the entire enhancement in sales price induced by those improvements. Thus, the incentive for making the improvements would remain the same as if traditional financing were used.

A desk appraisal could achieve the same result as AVMs by basing the final estimate of the value of a house on comparable home sales in the area without reference to any changes in the house itself since the initiation of the HAPN contract. Sometimes called a "desktop review," a desk appraisal gives the appraiser information on the attributes of a house based only on its initial appraisal. An estimate of its value at the time of sale is based on what comparable houses have been sold for. The current condition of the house is not taken into consideration. This has the effect of freezing the initial attributes of the house and avoiding the moral hazard. It also would be the easiest index to use in terms of developmental costs. This approach would be particularly feasible for markets where neither a public HPI nor a reliable AVM exists.

Whichever index is selected for a HAPN, the important point is that affordability is enhanced because investors would pay more for a share of house appreciation if they did not have to worry about the moral hazard of the SAM.

3.2   HAPNs as zero-coupon bonds

As noted above, a HAPN is a separate instrument that has a zero-coupon and no amortization payments whereas most SAMs include a monthly payment. This feature plays a critical role in the contribution that HAPNs could make toward making housing more affordable. While SAMs use the value of the transferred HPA to reduce the interest rate, HAPNs turn the capitalized value of sold HPA rights into a reduction in the principal amount financed by the interest-bearing, amortizing mortgage. Thus, they reduce the monthly payment for the house by a much greater amount than do traditional SAMs.

3.3   HAPN investors take the risk of housing price decreases

By investing in HAPNs, investors assume the risk of housing price decreases instead of homeowners. The SAM proposed by Caplin et al (2008) and most other existing SAMs do not have investors sharing in negative HPA. If HAPN investors shared in the downside, then homeowner equity would remain positive for wide downward swings in the HPA. Defaults would also be much less likely. As a result, homeowners would be more likely to stay in their houses through down cycles. This would result in fewer foreclosed houses being put on the market. Thus, recoveries – a current public policy objective – could take place faster. If HAPNs became widespread, this would help in the next housing decline.

This feature would also make HAPNs an attractive financing vehicle during the current housing recession. Buyers might be reluctant to buy homes in such a market if they were afraid of losing their initial equity should housing prices continue their downward spiral. Because HAPN investors would be the ones bearing the downside risk, homebuyers would be less likely to put off buying homes. This would increase current demand and consequently accelerate the housing recovery. In the interest of affordability (i.e., because it would affect the amount investors are currently willing to pay for HAPNs), there might be a need to set limitations on the amount of downward exposure investors could take on, such as limitations on investors sharing in the downside if the house were sold within a short period of time – for example, within three years. If the market declined after the purchase took place, homeowners would know that they would be protected by the HAPN if they delayed their sale until this "grace period" had been reached. This would reduce the supply of housing available for sale during a housing downturn, which would help relieve some of the pressures on the housing market.

The ultimate limit of downside protection with HAPNs is the face value of the HAPN bullet mortgage. That is, HAPN investors can lose – at most – their initial investment. The HAPN mortgage is, then, the performance bond for negative HPA. The amount of the negative HPA would be deducted from the face value of the HAPN until the entire face value is exhausted.

3.4   HAPN maturity is tied to the sale of the house

Unlike with traditional mortgages, in their basic form, HAPNs cannot be freely prepaid. While some homebuyers might want clauses in their contracts that allow for prepayment prior to the sale of the house, this would be viewed negatively by investors and lower the HAPNs market value. During a housing recession such as what is now taking place, the right to prepay HAPNs after housing prices fell, and were about to rise again, would discourage investors from entering into HAPNs contracts or paying any significant amount for them. Only when investors have a strong expectation of obtaining what they consider a "normal" real estate return would they be willing to pay enough for HAPNs to have beneficial effects on the affordability of housing. Another advantage of not allowing prepayments is that investors would then not have to face prepayment risks or the complex analytics and econometrics necessary to address these risks.

To encourage homeowners to issue HAPNs, it might be necessary to make it possible for them to prepay. For various reasons, such as an increase in homeowners' income or wealth, they might be interested in calling back outstanding HAPNs. If HAPNs became a liquidly traded security, homeowners could easily offset their position by purchasing another one in the open market, allowing them to "prepay" indirectly. It might be advantageous to let homeowners prepay HAPNs under certain conditions, such as after five years and then making them callable at subsequent anniversaries. Such a Bermuda call provision might provide the desired flexibility to homeowners without having a substantial impact on the market value of HAPNs.

In the reference section below, we cite a number of references that advocate instruments that appear to be more advantageous than traditional SAMs. Only Shiller and Weiss (1998, 2000), Liu (2007), and Oppenhiemer (1997) suggest the use of an index to compute the HPA and avoid the moral hazard of SAMs. None of them use AVMs or desk appraisals. Moreover, they do not have the other unique features of HAPNs, and they are not as effective in enhancing affordability or protecting homeowners from the risk of house prices falling.

4.   Market Value of HAPNs

The market value that an investor is willing to pay for a HAPN varies with the investor's expectation of the local HPA and the homebuyer's tenure. Following the discounted cash flow approach, the HAPN value can be derived by:

$$V = \int \left[f(t) \frac{E(CF_t)}{(1+k)^t} \right] \partial t$$

where V is the market value of the HAPN, k is the risk-adjusted return required by the investor, f(t) is the probability density function that the house will be sold at time t, and E(CF_t) is the expected HAPN payoff if the house is sold at time t, which includes the expected house appreciation and the repayment of the par value (the initial HAPN price).

Using the Office of Federal Housing Enterprise Oversight (OFHEO) house price indices, Cho, Lin, and Yang (2008b) estimated the long-term average HPA in the United States as ranging from 3.8% to 8.5%, with an average of 5.5%. The average tenure of homeownership in the U.S. typically ranges from four to eight years. In Table 1, we estimate the market values of the HAPN as a percentage of the house value under different parameter combinations. The version of the HAPN being priced is the one described above, whereby the homeowner is guaranteed 1% per year appreciation.

Table 1   Market Value of the HAPN as a Percentage of Initial House Value

		Tenure in Years		
k	E(HPA)	4	8	12
	3.0%	23	20	18
8%	5.5%	53	50	46
	8.0%	86	84	82
	3.0%	18	15	13
10%	5.5%	41	37	33
	8.0%	67	63	59
	3.0%	14	12	9
12%	5.5%	34	29	24
	8.0%	54	49	43

The pattern found in Table 1 is quite intuitive. The HAPN value is higher when the expected HPA is higher and when the required return by the investor is lower. The market value also decreases as the tenure of the homeownership becomes longer. In the real world, investors are likely to incorporate the housing cycle into the HPA. As a result, the HAPN value will likely vary throughout the business cycle. The investors are also likely to assign probabilities among different tenure years. We use the HAPN value of 37% of the underlying housing value (k = 10%, E(HPA) = 5.5%, Tenure = 8 years) for numerical examples in the rest of the paper.
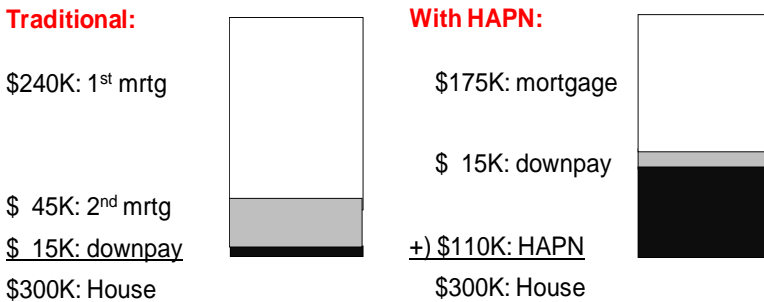
5.   HAPNs Improve Homeownership Affordability

Most homeowners would need a greater amount of financing than just the HAPN. When a homeowner buys a house with a traditional mortgage and a HAPN, we

assume that the traditional mortgage would be the first lien and the HAPN the second lien.[3]

Figure 1 compares the typical HAPN structure with traditional financing and with a 5% down payment on a US$300,000 house.

Figure 1   Traditional Mortgage and HAPN Financing

Traditional:

$240K: 1st mrtg

$ 45K: 2nd mrtg

$ 15K: downpay

$300K: House

With HAPN:

$175K: mortgage

$ 15K: downpay

+) $110K: HAPN

$300K: House

The traditional financing is assumed to be a first mortgage of $240,000 and a second mortgage of $45,000, with interest rates of 6% and 12%, respectively. Without losing generality, we assume interest-only payments. At a 36% payment-to-income ratio (PTI), the borrower needs to have an annual income of at least $55,000 to afford this type of traditional financing package.
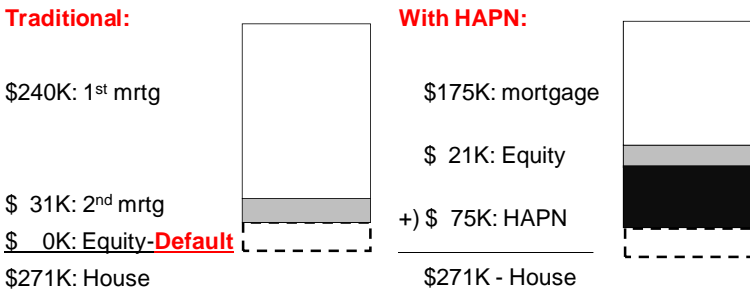
The right-hand side shows the HAPN financing. Following Table 1, we assume that HAPN investors would pay $110,000 ($300,000 times 37%) for the HAPN. With the same $15,000 down payment, the homebuyer would only need to borrow a first mortgage of $175,000. Assuming the same 6% interest rate as in the traditional example, the annual mortgage payment would be only $10,500. Because there would be no monthly payments for the $110,000 HAPN bullet mortgage, this would be the entire mortgage payment that the borrower would need to pay annually. Thus, using a HAPN, the payment burden would be reduced by 47% relative to traditional financing. Using the same 36% PTI as before, the income requirement would be $29,200, or 47% less than with the traditional financing.[4]

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[3] Other subsequent liens are possible, e.g., for home improvements, subject to the approval of the HAPN investors.

[4] Note that if there were no second mortgage in the traditional case, there would be mortgage insurance premiums and if there were risk-based pricing on the first mortgage, the mortgage rate would be higher in the traditional case. The reduction in the required income with the HAPN financing could be even greater than 47%. The amortization component of payments would also be lower with HAPNs.

This example demonstrates an important feature of HAPNs: affordability. Another important feature is that HAPN investors would accept the housing price risks associated with home ownership. Risks are often associated with negative results, but in economic terms, they can lead to both negative and positive outcomes. It is the downside risk that many homeowners are not capable of handling – as we painfully see today with the high foreclosure rates and the loss of lifetime savings in some cases. We compare the hypothetical results if home ownership is transferred after two years of declining housing prices. Figure 2 shows the result of the traditional and HAPN financing packages with a decrease in the HPA of 5% per year.

Figure 2   Outcomes Given Downside Risk

Traditional:

$240K: 1st mrtg

$ 31K: 2nd mrtg
$ 0K: Equity-**Default**
$271K: House

With HAPN:

$175K: mortgage

$ 21K: Equity

+) $ 75K: HAPN

$271K - House

In Figure 2, the house price drops to $271,000. For the traditional mortgage, the homeowner's equity would be wiped out and so would $15,000 of the second mortgage. This negative equity position would create the likelihood of default. If the borrower's income decreased or the payment of the traditional first mortgage rose,[5] this could very well be the stress that triggered the default.

On the other hand, in the HAPN case, HAPN investors would absorb all the negative HPA, plus the 1% per year promised return to the homeowner. The intrinsic value of the HAPN would fall to $75,000 while the homeowner's equity would actually increase to $21,000. So default would be very unlikely.[6] This scenario highlights one of the primary advantages for homeowners – the ability to stay in their houses even in a severe housing recession because it is the HAPN investor that assumes the downside risk. As mentioned earlier, many homeowners are not capable of bearing this risk. When they start defaulting on their mortgages, there can be serious chain reactions, further worsening the housing downturn.

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[5] For example, if either or both of the first and second mortgages were adjustable rates, the payment would increase with rising market interest rates or the expiration of the initial teasers.
[6] It is possible to incorporate a clause to prevent HAPN investors from paying the 1% return when the actual HPA is negative. Even with such a clause, the homeowner's equity would remain positive, the same as the initial down payment. Default would be highly unlikely to occur.

Needless to say, the reason that HAPN investors would be willing to risk a decline in housing prices is that they could also benefit from an increase in the price of housing. Figure 3 shows the results of the traditional and HAPN financing packages for an increase in HPA of 16% per year for two years.

Figure 3   **Outcomes in Upside Potential**

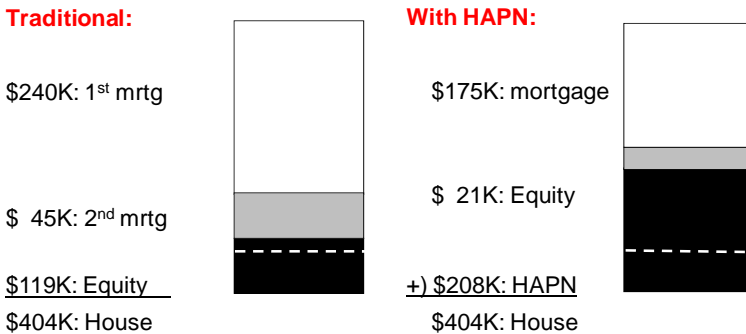| Traditional:	With HAPN:
$240K: 1st mrtg	$175K: mortgage
$ 45K: 2nd mrtg	$ 21K: Equity
$119K: Equity	+) $208K: HAPN
$404K: House	$404K: House

Figure 2 demonstrates that homeowners receive downside risk protection from HAPNs. Figure 3 shows that homeowners give up the potential for gain in exchange for the initial affordability. Their equity under traditional financing would grow to $119,000, but it would remain at the promised $21,000 under HAPN financing. On the other hand, the HAPN investors would receive $208,000 and a 37% annual return to compensate them for assuming the downside risk of HPA.

6.   HAPNs Improve Homeowners' Wealth Diversification

As financial instruments that are separate from the mortgage, HAPNs are a pure play on long-term HPA, an opportunity that is only available in the market today by investing directly in real estate. This is an advantage of HAPNs over most SAMs, which combine a traditional mortgage with an HPA investment.

Diversification of assets is a key investment strategy. For most homeowners, however, the majority of their wealth is concentrated in a single asset: their homes. The recent housing downturn has demonstrated the financial and emotional pain that such an inefficient concentration of risk can inflict. The ability to diversify investments is one of the major benefits that HAPN financing can offer homeowners.

If affordability is the primary concern, potential homeowners should consider a HAPN without an HPA guarantee instead of the type that assures a 1% capital gain. Using the same parameters as were used in Figure 1, a HAPN with no guaranteed capital gain would be worth 47% of the home's underlying value compared to 37% for one that assured a 1% capital gain. For some potential buyers, this extra amount would be just enough to make it possible for them to buy their first house. For others,

it would be enough to make it possible for them to buy a larger or a better quality house. Households less concerned with affordability could sell, perhaps, 60% and retain 40% of the HPA (with no guaranteed target HPA). In this case, the 60% HPA would be worth about 28% of the house's underlying value. What needs to be considered when choosing a HAPN is the tradeoff between a homebuyer's need for affordability and his or her investment preference.

7.   HAPNs as a Foreclosure Prevention Tool

HAPNs can be a very useful tool to help distressed homeowners retain their homes. They can also provide financial institutions with an instrument to reduce the amount of losses resulting from loan defaults and to improve the quality of the assets on their books. Assume that a home was purchased for $300,000 with a 5% down payment by a household with an income of $30,000 per year. Further assume that it was financed with a 30-year $285,000 ARM with a 4% initial teaser rate, with an annual payment of $11,400 (assuming interest-only for tractability), or a PTI of 38%.

Figure 4 describes what would happen in a "perfect storm" of the kind we have recently experienced. The rate would be reset to 6%, and the house price would fall by more than 10% to $270,000. The monthly payment would increase by 50%, and the price of the house would drop. Now the current loan-to-value ratio (LTV) would be 106%, and the PTI 57%. Selling the house to repay the mortgage would not be an option and default would most likely occur. Assuming a 45% loss-given-default rate in foreclosure sales, the loss to the mortgage lender would be about $128,000.

Figure 4   ARM with a Stress-Induced Default

➢ At Origination:	➢ At Rate Reset Date:
▪ House price = $300K	▪ House price = $270K
▪ Household income = $30K	▪ Household income = $30K
▪ 30-year ARM with 4% initial teaser rate	▪ ARM rate adjusted to 6%
▪ UPB = $285K	▪ UPB = $285K
▪ Payment = $11.4K/yr	▪ Payment = $17.1K/yr
▪ LTV = 95%, PTI = 38%	▪ LTV = **106%**, PTI = **57%**

HAPNs can be part of a financing package that allows homeowners to avoid defaulting and remain in their homes. They can also give mortgage investors an alternative to the high losses associated with foreclosures, creating a win-win situation. The HAPN solution works as follows. The lender purchases from the homeowner a HAPN worth $100,000 ($270,000 times 37%) and issues a $170,000 new fixed-rate mortgage. The lender needs to be willing to write off the $15,000 loss (versus $128,000 in the case of foreclosure) between the $285,000 unpaid principal

balance (UPB) of the existing mortgage and the current house value of $270,000. Because the new mortgage has a low initial LTV of 63%, it carries a lower interest rate of, for example, 6%. The homeowner uses the $100,000 received from selling the HAPN and the new mortgage of $170,000 to repay the existing mortgage (less the $15,000 written off by the lender) and ends up with zero equity. After the HAPN solution, the homeowner faces a $10,200 annual payment on the FRM (assuming interest-only) and no payments on the HAPN until sale of the house. As a result, the PTI after the solution is now 34% percent, which is lower than the original PTI.

Instead of losing about $128,000 through foreclosure, the lender writes off $15,000 and replaces the non-performing loan on its book with a low-LTV, or low-PTI, performing loan of $170,000 and a $100,000 HAPN. If the price of the house recovers to $300,000 in two years, it will realize an 11.6% annualized return on the HAPN, more than compensating for the initial write-off.

The borrowers get to stay in their homes, which they would otherwise not be able to afford. They will also enjoy a risk-free positive equity of $5,400 if the house is sold in two years (the 1% promised HPA per year from the HAPN investors). They would also avoid the blemish on their credit rating that would arise if they defaulted.

A faster recovery would be promoted because there would be fewer foreclosed houses for sale owing to the foreclosure alternatives that HAPNs would provide. Also, as mentioned above, potential homebuyers would be less reluctant to buy as HAPN investors would be taking on their downside risks. These are two potentially powerful ways in which HAPNs could be used to reduce supply and increase demand for housing in this recessionary environment.

8.   Conclusions

We argue that homebuyers should have the option to decide how much of the investment component of their house they would like to buy in addition to the consumption component. By not having such a choice, many renters are locked out of homeownership altogether. As for homeowners, many cannot afford to buy a house suitable to meet their needs, and most are forced to have an investment portfolio with an excessive concentration of risk in only one asset: their home.

The Home Appreciation Participation Note (HAPN), when combined with a traditional mortgage, can address these issues in an efficient way. It can provide a bullet mortgage with no payments until the house changes hands, for a specified share in the appreciation of the house, as measured by an index so as to avoid the moral hazard endemic with Shared Appreciation Mortgages (SAMs) that use the price of the house to compute the shared appreciation.

With HAPNs, homeowners can select how much of the appreciation they want to sell. For example, they could be guaranteed a 1% per year appreciation rate, or sell

off 80% of the appreciation. The actual contract can be tailored to the household's needs. By being able to take on less of the investment component, homeowners would be able to have a portfolio that is not only less concentrated, but also more liquid.

HAPNs can protect homeowners from the downside risk of owning by shifting this risk to investors that are more capable of bearing and managing it. This can result in a variety of positive public policy outcomes. Potential buyers would be encouraged to make purchases during a housing downturn. By increasing demand and removing the oversupply of housing, HAPNs would help speed up the recovery process. HAPNs could further help speed up the recovery if they were used as a workout tool, allowing distressed homeowners to refinance into a combined HAPN and traditional mortgage that they were better able to afford. Thus, they would avoid putting another foreclosed house on an already saturated market.

We estimate that investors would pay 20% to 40% of the price of the house for various sharing arrangements, a key to housing affordability. As there would be no payments on this portion of the house-financing package, renters might become eligible to buy, and homeowners could buy larger or better quality houses.

Used as an alternative to foreclosure, HAPNs can help the economy recover faster. As they grow in popularity, they will ensure that the next down cycle will not be as severe – or as long-lasting. Finally, investors and government entities can earn positive returns over the longer term as the housing sector recovers.

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