

The Zero-Coupon/ Interest-Only Fixed-Rate Mortgage: An Alternative for Funding Low-to-Moderate Income Households

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Abstract. This proposal sets forth a concept for the public/private finance of owner-occupied, single-family homes for first-time homebuyers utilizing federal guarantees and private sector mortgages. Proposed funding requires no new tax revenues. The security that the program revolves around is a Zero-coupon/Interest-only Fixed-rate mortgage (ZIF). The ZIF has the potential to improve the allocation of resources for subsidizing low-income housing, to reduce risk exposure to rapidly declining property values, and to improve the self-esteem of a group of Americans who have been depressed for far too long by making homeownership a reality.

Introduction

Homeownership is a quest of most Americans. Unfortunately, hard economic times have forced this quest to be nothing more than an elusive dream for many in the lower and middle classes of our society. Trouble usually originates from lack of an adequate downpayment to qualify under the strict guidelines of most mortgage contracts. While past and existing federal, state and local programs including federal grants and low interest loans have met with varying degrees of success, they have not succeeded in making homeownership a more attainable goal to the majority of the poor in our society. It is also clear that, in an environment of large budget deficits and scarce financial resources, new affordable housing initiatives must not only be cost-effective, but also be revenue neutral or revenue enhancing.

This proposal sets forth a concept for the public/private finance of owner-occupied, single-family homes for first-time homebuyers. The concept utilizes agency guarantees (federal, state, or local) and private sector mortgages. The security that the program revolves around is a Zero-coupon/Interest-only Fixed-rate mortgage (ZIF), a hybrid security consisting of an interest-only mortgage coupled with the additional security of government-subsidized zero-coupon bonds. The ZIF has the potential to improve the allocation of resources for subsidizing low-income housing, to reduce risk exposure to rapidly declining property values, and to improve the self-esteem of a group of Americans who have been depressed for far too long by making homeownership a reality.¹

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Affordable Housing and Homeownership

Stimulating private homeownership has been one of the hallmarks of U.S. government fiscal policy for decades. Government mortgage guarantee and insurance programs have met with varying degrees of success in assisting homebuyers in securing the funds necessary to acquire their own homes. In addition, fiscal policy has reduced the cost of homeownership through the federal tax deductibility of home mortgage interest and property taxes. Congress and the President are currently discussing legislation that would provide tax credits to first-time homebuyers.

The Issues

While these policies have had the desired effect of assisting millions of American families in securing their own homes, these policies have also, in general, failed several key tests of fairness. Consider the concept of horizontal equity, i.e., that people of similar economic circumstances are treated equally. First-time homebuyer tax credits fail this test of fairness for several reasons. First, not all first-time homebuyers are able to take full advantage of the tax credit, either because their circumstances do not allow a tax credit to be taken at all, or because the tax credit must be spread out over several years. Second, a tax credit is an "up front" incentive that is not tied to any subsequent performance by the individual. First-time homebuyers who use the credit and then eventually default on their mortgages are treated the same as first-time homebuyers who continue to honor their obligations. Mortgage insurance programs, such as those administered by the FHA, suffer a similar flaw. Diligent borrowers are penalized to the benefit of those who default.

The second fairness issue deals with who will be the ultimate beneficiaries of these programs. Tax credits do have a market effect. Because of supply and demand realities, the presence of a first-time homebuyer tax credit is likely to raise the market price of "starter" homes. Thus, some or all of the economic benefit of the credit is transferred from the homebuyer to the home seller—an unintended, but real consequence. Similarly, it is a well-known, documented fact that homebuyers utilizing VA and FHA mortgage programs end up paying costs (such as points) that home sellers are supposed to pay. There is also the cost/benefits dynamic of these programs. For each dollar allocated to a mortgage subsidy program such as a first-time homebuyer tax credit program or an FHA insurance program, the percentage of each dollar that actually goes to benefits must be weighed against the percentage siphoned off by third-party participants.

A final fairness issue revolves around the federal tax deductibility of home mortgage interest. Historically, home mortgage interest has been tax deductible because private homeownership is believed to be a desirable social good. But to what degree should the federal government continue to subsidize homeowners once they have acquired their own homes? For example, if Taxpayer A is in the 28% marginal tax bracket and pays \$50,000 a year in home mortgage interest, the federal tax subsidy received would be \$14,000. Meanwhile, Taxpayer B in the 15% marginal tax bracket paying only \$5,000 a year in home mortgage interest receives a federal subsidy of only \$750. One would suspect that the tax deductibility of home mortgage interest

was intended to aid citizens like Taxpayer B more than citizens like Taxpayer A, yet that has not been the outcome.

Promoting Fairness in Homeownership Programs

Making homeownership accessible to a larger percentage of American families requires a plan that meets several criteria: 1) to maximize the benefit/cost ratio, 2) to promote horizontal equity, and 3) to provide beneficiaries with a performance incentive. To maximize the benefit/cost ratio, the program must first be designed so as to minimize administrative overhead. Next, the private sector of lenders and developers must embrace the plan without demanding substantial incentive payments to secure their participation. Finally, taxpayers must view the plan as a positive augmentation to (or substitution for) existing housing programs. To meet the second criteria of horizontal equity, the plan must treat all intended beneficiaries of similar economic circumstances equally. With this in mind, the third criteria of performance incentives must be designed to reward homebuyers who avoid subsequent default.

The Zero-Coupon/Interest-Only Fixed-Rate Mortgage

The Zero-coupon/Interest-only Fixed-rate mortgage or ZIF has the potential for satisfying the criteria set defined above.

Overview

In general, the ZIF would take the following form.² A primary mortgage lender with a qualified applicant³ for a thirty-year self-amortizing fixed-rate mortgage (FRM), offers the mortgagor an alternative to normal financing. Instead of making monthly payments over the course of the next thirty years (or until the mortgage is prepaid) that go towards both interest on the outstanding balance as well as a contribution to principal repayment, payments are strictly interest-only. There is no noticeable reduction in the amount of the payment made, only the distribution of the payment.

This alternative mortgage instrument offered to the borrower is an interest-only mortgage for thirty years coupled with four U.S. Treasury zero-coupon bonds (Zeros) to be held in trust. The Zeros will mature in exactly thirty years with a terminal value equal to the face value of the interest-only mortgage.⁴ The zero-coupon bonds would be in lieu of a portion of the downpayment from the mortgagor. To eliminate the costs associated with mortgage insurance, the potential mortgagor will still have to come up with a small downpayment to satisfy the 80% loan-to-value ratio. To encourage ongoing homeownership, the sponsoring government agency would transfer ownership of the Zeros over time to the mortgagor as long as mortgage payments were made in a timely fashion, owner-occupancy continued, and the home was properly maintained.

Thus, the ZIF has a couple of advantages over a traditional fixed-rate mortgage with a government subsidy in the form of low interest rates or tax subsidy. First, this option has the potential to reduce the default risk since the interest-only mortgage is backed by both the borrower's home and by the zero-coupon bonds. If the borrower holds the ZIF the entire thirty years, then at maturity the borrower delivers the zero-coupon bonds to the lender in satisfaction of the entire outstanding principal balance regardless of what happens to interest rates over the life of the loan. However, if the borrower chooses to prepay the entire outstanding balance of the ZIF at any point prior to thirty years, the zero-coupon bonds would only partially satisfy the outstanding principal balance. The remaining principal balance comes from the proceeds on the sale of the home, a new mortgage, or other sources.

Second, the transfer of ownership of the zero-coupon portion of the mortgage package needs to be structured so that continued homeownership is rewarded. For example, the value of the Zeros could remain with the government agency for the first five years of the mortgage. After this initial occupancy period, the value of the zero-coupon bonds would be proportionately transferred to the homeowner over time. This would allow the mortgagor to share in the rewards of any appreciating value in both the Zeros and the home.

Another potential benefit would be the opportunity for the lender to sell the package in the secondary mortgage market. The ZIF has the potential of reducing prepayment risk to the outside investor.⁵ Unlike a traditional fixed-rate mortgage where the entire remaining balance is prepaid, the prepaid ZIF still has a portion of its total value "alive" at prepayment, namely the zero-coupon bonds. The lender can retain claim on the Zeros until they mature or sell them. Thus, the potential is that the lender has not suffered as great a degree of prepayment risk as he or she would with a traditional FRM.

The key factor is that the ZIF's primary advantage materializes during periods of falling interest rates. With falling interest rates, there is an increased incentive to prepay to either refinance at a lower rate or to pay off the mortgage early. With falling rates the value of the Zeros increases, producing a potential capital gain, and lessens the effect of prepayment risk. Even within a flat interest-rate environment, there is little incentive to prepay with the advantage of the Zeros maintaining increased collateral to reduce default risk.

The last interest-rate environment, rising rates, has the most risk. But this risk exists only if prepayment occurs. Without prepayment, the Zeros at maturity will still cover the interest-only mortgage. The ZIF could also be structured so that the guaranteeing agency insures that the Zeros do not depreciate in value before ownership is transferred to the mortgagor. In either form, the ZIF is not proposed as a mortgage instrument that entirely protects the lender or the secondary market holder from prepayment risk. The claim is only that prepayment risk is reduced.

Getting Primary Mortgage Lenders Involved

One of the biggest risks borne by investors within the secondary mortgage market is prepayment risk, especially when interest rates are high and expected to fall. As compensation for this risk, prices of mortgage-backed securities are lower (yields are

higher) than they would be if the prepayment risk were eliminated entirely.⁶ This forces the mortgages backing the secondary mortgage security to be priced lower as well. And since a large number of all new residential mortgages are immediately sold into the secondary mortgage market (SMM) by primary mortgage lenders and brokers, interest rates to residential mortgagors are also higher when the mortgagor can prepay any or all of the outstanding principal without penalty than if a penalty were charged for prepayment.⁷

Because the secondary mortgage market is so large and because reducing the prepayment risk is important in the pricing of mortgages, a natural question arises. Can primary mortgage market lenders modify the mortgage products they offer to make them more attractive to the secondary market? Since the inclusion of a prepayment penalty in the mortgage contract, as analyzed by Dunn and Spatt (1985), has been legislated out in most states, alternative forms of prepayment protection must be found.

One alternative to explicit prepayment penalties is the ZIF, a proposed mortgage instrument that reduces prepayment risk.⁸ At one time, it was thought the adjustable-rate mortgage (ARM) would serve this purpose since ARM mortgagors benefit through a reduction in their monthly payments when interest rates fall.⁹ While ARM mortgagors may be less likely to refinance when interest rates fall, there is still a tendency for ARM mortgagors to refinance to a fixed-rate mortgage (FRM) when interest rates drop substantially, preferring to trade the potential lower rate offered by the option-laden ARM (see Hayre, 1990) for the surety of a fixed interest rate, and, thus, fixed payment. But even if no ARM mortgagor were to refinance, prepayments would still exist due to property sales and borrower defaults.

The proposed mortgage instrument, the zero-coupon/interest-only fixed-rate mortgage (ZIF), has the potential to reduce prepayment risk. This reduction is brought about by encouraging long-run homeownership by prorating ownership in the underlying Zeros over time and by maintaining a portion of the mortgage package that does not have to be reinvested with prepayment, namely the Zeros.

ZIF: An Example

Suppose a borrower seeks a mortgage for a property with an appraised value of \$100,000. The prevailing rate on a new, thirty-year fixed-rate mortgage (FRM) is 8%. Local mortgage lenders require at least a 20% downpayment on a conventional FRM (a loan-to-value ratio not exceeding 80%) to avoid private mortgage insurance (PMI). Thus, the homebuyer would need a downpayment totaling \$20,000 to qualify for a conventional FRM without PMI. The lender would then be willing to write an \$80,000, thirty-year FRM with monthly payments of principal and interest totaling \$587.01. The home serves as collateral for the mortgage. See Exhibit 1 for a summary of the payments, interest and outstanding principal over time, assuming interest rates remain at 8%.

As an alternative, a public agency (HUD, state, local) agrees to assist the first-time homebuyer through a ZIF. Under this arrangement, the lender agrees to write the first-time homebuyer an interest-only, 8%, thirty-year mortgage for \$88,052, but the public agency agrees to guarantee \$8,052 of this amount by issuing a total of four

Exhibit 1
Example of Standard Fixed-Rate Mortgage Alternative

Beginning Principal					\$80,000.00	
Interest Rate (% APR)					8.000%	
Term (Months)					360	
Marginal Tax Bracket					15.00%	
PV of After-Tax Pmts					\$80,000.00	
Month	1	2	3	4	5	6
	Beginning	Principal	Interest	Total	Ending	After-Tax
	Principal	Payment	Payment	Payment	Principal	Payment
1	\$80,000.00	\$53.68	\$533.33	\$587.01	\$79,946.32	\$507.01
12	79,389.46	57.75	529.26	587.01	79,331.71	507.62
24	78,670.49	62.54	524.47	587.01	78,607.95	508.34
36	77,891.85	67.73	519.28	587.01	77,824.12	509.12
48	77,048.59	73.35	513.66	587.01	76,975.23	509.96
60	76,135.33	79.44	507.57	587.01	76,055.89	510.88
72	75,146.27	86.04	500.98	587.01	75,060.23	511.87
84	74,075.12	93.18	493.83	587.01	73,981.95	512.94
96	72,915.07	100.91	486.10	587.01	72,814.16	514.10
108	71,658.73	109.29	477.72	587.01	71,549.45	515.35
120	70,298.12	118.36	468.65	587.01	70,179.76	516.71
180	61,601.58	176.33	410.68	587.01	61,425.25	525.41
240	48,645.08	262.71	324.30	587.01	48,382.37	538.37
360	583.12	583.12	3.89	587.01	0.00	586.43

(\$2,013) thirty-year, zero-coupon bonds carrying an interest rate of 8%. The four Zeros, if held to maturity thirty years hence, would be worth a total of \$88,052 (the face value of the interest-only mortgage). The Zeros will be held in trust in favor of the lender should a default on the interest-only mortgage occur. Thus, the lender's total collateral is now the home (valued at \$100,000) plus the guarantee (valued at \$8,052). The value of the collateral in excess of the loan is still \$20,000 (\$108,052 - 88,052). The \$88,052 interest-only mortgage at 8% for thirty years would require the same monthly payment as the FRM (i.e., \$587.01). See Exhibit 2 for a summary of the payments, interest and collateral under the ZIF program over the life of the mortgage, assuming interest rates remain at 8%.

Exhibit 2
Example of Monthly Payments under ZIF

Zero-Coupon Bond				Interest-Only Mortgage		
Beginning Principal		\$8,051.75		Beginning Principal	\$88,051.75	
Interest Rate (% APR)		8.000%		Interest Rate	8.000%	
Term (Months)		360		Term (Months)	360	
Maturity Value		\$88,051.75		Marginal Tax Bracket	15.00%	
				PV of After-Tax Pmts	\$87,557.00	
Month	1 Beginning Principal	2 Interest Received	3 Ending Principal	4 Interest Paid	5 Net Interest	6 After-Tax Payment
1	\$8,051.75	\$53.68	\$8,105.43	\$587.01	\$587.01	\$498.96
12	8,662.29	57.75	8,720.04	587.01	587.01	498.96
24	9,381.26	62.54	9,443.80	587.01	587.01	498.96
36	10,159.90	67.73	10,227.63	587.01	587.01	498.96
48	11,003.16	73.35	11,076.52	587.01	587.01	498.96
60	11,916.42	79.44	11,995.86	587.01	587.01	498.96
72	12,905.48	86.04	12,991.51	587.01	500.98	511.87
84	13,976.63	93.18	14,069.80	587.01	493.83	512.94
96	15,136.68	100.91	15,237.59	587.01	486.10	514.10
108	16,393.02	109.29	16,502.30	587.01	477.72	515.35
120	17,753.63	118.36	17,871.99	587.01	468.65	516.71
180	26,450.17	176.33	26,626.50	587.01	410.68	525.41
240	39,406.67	262.71	39,669.38	587.01	324.30	538.37
360	87,468.62	583.12	88,051.75	587.01	3.89	586.43

Notes: Zero-coupon bond is held in trust as additional collateral for the interest-only mortgage. Before-tax payments (\$587.01) on the interest-only mortgage equals before-tax payments on the fixed-rate mortgage. After-tax payments on the interest-only mortgage equals after-tax payments on the fixed-rate mortgage only after ownership (along with the tax obligation) of the zero-coupon bonds are transferred to the homeowner after the fifth year.

During the first five years of the ZIF, the Zeros are owned by the public agency. Thus, if the homebuyer sells the house, defaults, or otherwise liquidates his/her

Exhibit 3
Subsequent Market Value of Zero-Coupon Bond

Beginning Principal	\$8,051.75
Interest Rate (% APR)	8.000%
Term (Months)	360
Maturity Value	\$88,051.75

Month	1 Beginning Principal	2 Interest Received	3 Ending Principal
1	\$8,051.75	\$53.68	\$8,105.43
12	8,662.29	57.75	8,720.04
24	9,381.26	62.54	9,443.80
36	10,159.90	67.73	10,227.63
48	11,003.16	73.35	11,076.52
60	11,916.42	79.44	11,995.86
72	12,905.48	86.04	12,991.51
84	13,976.63	93.18	14,069.80
96	15,136.68	100.91	15,237.59
108	16,393.02	109.29	16,502.30
120	17,753.63	118.36	17,871.99
180	26,450.17	176.33	26,626.50
240	39,406.67	262.71	39,669.38
360	87,468.62	583.12	88,051.75

interest in the mortgage during the first five years, the homebuyer has no claim on the Zeros. However, at the end of five years (sixty months), the Zeros are gradually transferred to the first-time homebuyer if the homebuyer has made the mortgage payments on time throughout the first five years. On the fifth, sixth, seventh, and eighth anniversary dates of the mortgage (months 60, 72, 84, and 96), one of the four Zeros is given to the homebuyer by the public agency. The Zeros still remain in trust in favor of the lender until the mortgage is repaid. Thus, after eight years (ninety-six months), the first-time homebuyer now has all four Zeros. If the market interest rate on the Zeros is still 8%, those Zeros now have a market value of \$15,237.59. A summary of the market value of the zero-coupon bonds assuming that interest rates remain at 8%, is shown in Exhibit 3.

Although interest accrues on the Zero, but is not paid until the Zero is sold or matures, the trust or government agency would be liable for the taxes on the accrued increase in the value of the Zero each year until ownership is transferred to the mortgagor. If the trustee is a tax-exempt entity, no tax liability occurs. Once ownership is transferred to the mortgagor, future tax obligations can be offset against the interest tax credit from the interest paid on the interest-only mortgage. Tax liability would only accrue from the basis that exists at the time ownership is transferred. The process illustrated in Exhibit 2 assumes ownership of the zero-coupon bond is transferred to the homeowner after five years and that the mortgage is held until maturity.

Two basic scenarios exist over the life of the mortgage depending on the action taken before or after the five-year transfer of the first zero-coupon bond. In the first scenario, the house is sold, the mortgage is liquidated, or the mortgage goes into default during the first five years. Under Case 1, Scenario 1, the house is sold for more than the \$88,052 mortgage. In this case, the lender receives the first \$88,052 and the homebuyer is entitled to any amount in excess of the \$88,052. The public agency's guarantee is extinguished and the Zeros are retired without cost to the agency. Under Case 2, Scenario 1, the house is sold for between \$80,000 and \$88,052. In this case, the lender still receives \$88,052. The public agency makes up the difference between the selling price and \$88,052. The public agency's maximum exposure is \$8,052, the initial cost of the zero-coupon bonds. The homebuyer receives nothing. Under Case 3, Scenario 1, the house is sold for less than \$80,000. In this case, the lender receives all of the proceeds from the sale of the house plus the \$8,052 guarantee from the public agency. The homebuyer receives nothing but is still legally responsible for the shortfall to the lender. If the homebuyer defaults on this obligation, a bad credit rating would be attached to any future credit reports and future loans would become more difficult to obtain. Other legal actions could be undertaken by the lender towards the homebuyer, as is the case of default within a normal mortgage transaction.

The second scenario occurs when the house is sold, the mortgage is liquidated, or the mortgage goes into default after the first five years, the time frame in which ownership in the Zeros is transferred to the homebuyer. Under Case 1, Scenario 2, the homebuyer defaults on the mortgage. In this case, the house is sold and the proceeds are used to satisfy the \$88,052 interest-only mortgage. If the proceeds from the sale are less than \$88,052, the Zeros now owned by the homebuyer are delivered to the lender to make up the difference. If the Zeros' market values are not sufficient to make up the difference, the Zeros owned by the public agency are delivered to the lender to make up any remaining difference. If any shortfall still remains, the homebuyer is legally liable to satisfy the shortfall or suffer any legal consequences.

Under Case 2, Scenario 2, the homebuyer sells the house outright. In this case, the proceeds of the sale of the house are used to pay off the \$88,052 interest-only mortgage. If the proceeds from the sale are less than \$88,052, the Zeros now owned by the homebuyer are delivered to the lender to make up the difference. If these Zeros' market values are not sufficient to make up the difference, the Zeros owned by the public agency are delivered to the lender to make up any remaining difference. Again any shortfall in the mortgage repayment beyond the transfer of the Zeros is the responsibility of the homebuyer. If the proceeds from the sale of the house exceed \$88,052, the homebuyer may keep the Zeros he or she now owns, or may sell them. Any Zeros owned by the public agency are retired.

Under Case 3, Scenario 2, the homebuyer voluntarily decides to refinance to a different mortgage. In this case, the homebuyer has claim to any Zeros that have been transferred. The agency retires the non-transferred Zeros without obligation to the homebuyer. Finally, under Case 4, Scenario 2, the homebuyer pays off the interest-only mortgage prior to maturity. In this case, the homebuyer may keep the Zeros he or she now owns, or may use the Zeros he or she now owns to help pay off the mortgage. The agency retires any Zeros that have not yet been transferred to the homebuyer.

Of course other scenarios could exist. For example, if the prevailing interest rate was 7% versus 8%, the zero-coupon bond/interest-only mortgage combination would only require the homebuyer to make less than a 9% downpayment while still avoiding PMI. Virtually any combination of desired loan-to-value ratio and interest rate scenarios including interest-rate changes that could drastically effect the value of the Zeros, can be plugged into the model.

Advantages of the ZIF

Advantages to the Lender

For the primary mortgage originator, there may be several advantages to offering a ZIF instead of a standard fixed-rate mortgage.¹⁰ Among these advantages are:

- 1) No additional principal exposure relative to a standard, fixed-rate mortgage.
- 2) Zero-coupon bond collateral represents minimal default risk, none if Zeros are issued by the federal government.
- 3) Default risks are reduced since the Zeros are held in trust in favor of the lender until the mortgage is fully satisfied. More paperwork for the lender in event of foreclosure versus FHA/VA programs is a possibility.
- 4) Borrower can qualify for a mortgage with smaller downpayment. For our 8% mortgage example, the downpayment without PMI is less than 12%. If interest rates dropped to 7%, the downpayment without PMI is less than 9%.
- 5) Because benefits are greatest to borrowers who do not default, there is an additional incentive for borrower to remain current on mortgage payments. Unlike FHA insurance programs where the diligent borrower is penalized (he or she pays for insurance to cover other borrowers' defaults), under this plan, the diligent borrower is rewarded.
- 6) Reduced reinvestment risk on the zero-coupon portion because the principal amount of a ZIF is paid off only from a sale prior to maturity. The zero-coupon bond portion of the mortgage (i.e., the Zeros) remains "alive" throughout. Because of this, the lender can resell each element of the ZIF separately (i.e., a zero-coupon "strip" as well as an interest-only "strip" just like secondary mortgage market (SMM) buyers sell strips). In this respect, the primary lender conceivably could act just like a secondary market maker. Eliminating the "middleman" may improve the marketability of this type of mortgage, generating a more attractive price for the lender. Also the lender need not worry about reinvesting any principal proceeds prior to the maturity of the interest-only mortgage.

- 7) If interest rates remain flat or drop, the lender's guaranteed collateral may increase. As suggested by the example above, a borrower selling his/her home or prepaying the entire mortgage uses the increasing value of the Zeros to satisfy the mortgage obligation. Thus, the lender is exposed to less market risk on collateral backed only by the value of the house.
- 8) The zero-coupon bonds represent riskless collateral. Mortgage defaults frequently occur when the collateral value of the house drops below the face value of the mortgage debt (the loan-to-value ratio exceeds 100%). Although the ZIF does not eliminate this risk, the fact that a portion of the collateral is in the form of a riskless bond may reduce default risk.
- 9) A potentially simpler conversion feature may exist. If the borrower chooses to refinance a ZIF to an FRM (due to a drop in interest rates), a lender may be able to finance this transaction "in house" and eliminate many of the transactions costs associated with mortgage refinancing.

Advantages to the Sponsoring Agency

For the sponsoring agency, there may be several advantages to offering a ZIF instead of a tax credit or other mortgage incentive. Among these advantages are:

- 1) A government agency holds the zero-coupon bonds in trust, therefore no initial cash expenditure needs to be made.
- 2) The program could be guaranteed by existing government agencies such as the FHA or VA.
- 3) If programs are not guaranteed by the FHA, then the underlying fees could be eliminated and the savings passed on to the borrower.

Advantages to the Borrower

For the borrower, there may be several advantages to offering a ZIF instead of a tax credit or other mortgage incentive. Among these advantages are:

- 1) Unlike a first-time homebuyer tax credit, the ZIF plan benefits all eligible first-time homebuyers, regardless of their tax position. Some will not be able to take advantage of a tax credit because they will not have a tax liability anyway.
- 2) By offering the lender additional collateral, the borrower has the potential to qualify for a larger mortgage with the same amount of capital or the same size mortgage with less capital. The ZIF reduces a homebuyer's downpayment (from 20% to less than 12% under our 8% scenario). Thus, ZIF helps qualify first-time homebuyers who might otherwise be unable to get a mortgage.
- 3) The ZIF plan rewards sustained good behavior. Unlike a tax credit which is not tied to subsequent performance, the ZIF plan gives greater rewards to homebuyers who continue to honor their mortgage obligations than it does first-time homebuyers who subsequently default.
- 4) The ZIF plan gives homebuyers an incentive to stay in their homes, make their mortgage payments on time, and take care of their homes. This should have the effect of stabilizing neighborhoods and improving the value of homes financed by the ZIF program.

- 5) The most distinct advantage to the borrower under a ZIF is the potential to share in the appreciation of the Zeros if interest rates drop. This appreciation in the value of the Zeros is transferred to the homebuyer only if the requirements of the mortgage are fulfilled. However, the borrower is exposed to greater interest-rate risk if interest rates rise and the value of the Zeros declines. In such an environment, a forced liquidation of the mortgage may require the borrower to repay more than the face amount of the interest-only portion of the mortgage. Supplementing the ZIF with interest insurance could offset this disadvantage if it could be accomplished at a low enough cost.
- 6) Alternative formats to encourage pride and stability in ownership could be incorporated into the ZIF program for the tax basis of the Zeros, tax deferral on interest, assumability, and adjustable-rate interest Zeros. For example, the basis in the Zero could be based on the transfer amount, not the original issue price, or the increased value of the basis could be prorated over time. Another alternative is that the basis in the Zero could be rolled over into the basis of the new property in the case where the home is sold and replaced, thus allowing for and encouraging upward mobility in homeownership.

An allowance for a tax deferral period on the interest generated from the Zeros could also be incorporated if the government agency issues the Zeros with special tax-free status. This tax-free status could be tied to continued mortgage payments and owner-occupancy to encourage stability of ownership in the property. Another alternative would have a state or local government agency issue special tax-free zero-coupon municipal bonds with maturities equal to the length of the mortgage.

By allowing the loan to be assumable with the Zeros as long as the same standards as the original mortgagor has to pass are met, would give the homebuyer an additional option during a sale. To help eliminate interest-rate risk, the Zeros could be issued with an adjustable interest rate. A variable-rate Zero, which is adjusted to the general level of rates, would reduce the risks to both the individual and lending agency during periods of rising interest rates. Of course this would also eliminate the potential for appreciation during periods of falling rates.

Summary

A new mortgage product, the Zero-coupon/Interest-only Fixed-rate mortgage (ZIF) has been proposed as an alternative to the standard fixed-rate mortgage (FRM) with a tax credit as a low-to-moderate income, first-time homebuyer housing assistance plan.¹¹ The ZIF offers several distinct advantages to potential lenders and borrowers, as well as the sponsoring government agency. To the originator there is the added collateral offered by the Zeros. The lender should also recognize that the incentives to the borrower for keeping payments current on the mortgage should reduce defaults, and reduce the paperwork associated with underperforming and nonperforming mortgage loans. An additional incentive to the lender is that the ZIF program offers a product with the ability to mimic the behavior of the secondary mortgage market.

Since the design of the ZIF eliminates partial prepayments, the greatest risk borne by investors in the secondary mortgage market, "prepayment risk," is reduced. The ZIF does allow for total prepayments, so that prepayment risk is not totally eliminated (i.e., risk due to refinancing, sale of properties, and borrower defaults still exist). As a result, unlike buyers of CMOs who face substantial uncertainty with respect to the duration of their investment, the buyer of a ZIF security is more secure in the duration of the investment.

From the homebuyer's viewpoint, the ZIF program helps eliminate the costs of PMI payments as well as reduce the amount of downpayment needed to qualify for a mortgage. The ZIF also rewards the homebuyer for keeping mortgage payments current. Finally from the agency's viewpoint, the ZIF offers an alternative program for assisting first-time homebuyers that could be targeted to specific geographical locations or income groups. Since the public agency will issue the Zeros and then retain them in its own portfolio, no immediate expenditure of public funds is necessary. In addition, the program is structured to reduce defaults by rewarding the homebuyers for keeping their mortgage obligations current. Therefore, the costs of this program versus alternatives should be substantially lower. Since all the participants (the lender, the homebuyer, and the sponsoring agency) have the potential to gain, the ZIF program is a viable option to other housing incentive programs currently offered in the marketplace.

Notes

¹See Boyle (1989); Dunn and McConnell (1981a, 1981b); Figlewski (1981); Hendershott and Van Order (1987); and, Smith (1991) for a sample of mortgage instruments and applications. Also see Leung (1989) for an example of option pricing applied to the mortgage market.

²See Thode and Kish (1992) for more details.

³A qualified applicant is one that meets the requirements as set by the government agency sponsoring the mortgage subsidy.

⁴A zero-coupon bond accrues interest over its life, but no cash is received until the bond is sold or matures.

⁵Prepayment is a major concern to outside investors. See Navratil (1985) and Richard and Roll (1989) for further discussion of the effects and costs of prepayment risk in traditional mortgages.

⁶Pricing traditional mortgage products are discussed in Hendershott (1986), Epperson, Kau, Keenan and Muller (1985) and Schwartz and Torous (1989).

⁷See for example Black, Garbade and Silber (1981).

⁸A further reduction could be accomplished by eliminating partial prepayments altogether.

⁹See Phillips and VanderHoff (1991) for the factors deemed important in the adjustable- versus fixed-rate mortgage option.

¹⁰See Harris and Sirmans (1988) for a discussion on the effects of discount points and the contracted interest rate.

¹¹Outside investors look for diversification not just total return on their investments. For example, see Kuhle (1987) for the effects of portfolio diversification of common stocks versus real estate investment trusts (REITs).

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