

# AN EVALUATION OF THE ASSET INTEGRATED MORTGAGE

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The Federal National Mortgage Association (FNMA) recently approved a new type of hybrid mortgage, the Asset Integrated Mortgage (AIM), that combines a home loan and a fixed insurance annuity. The borrower invests most of the money in an annuity that is normally earmarked for the down payment. As long as the annuity investment plus the down payment exceeds 20 percent of the home's worth, the borrower avoids mortgage insurance costs, just like a conventional mortgage with 20 percent down. The AIM is being promoted as a way for consumers to save, diversify their asset base and build a nest egg for retirement.<sup>1</sup>

The purpose of this article is to evaluate the Asset Integrated Mortgage (AIM). A valuation model is established that compares the AIM with a conventional mortgage and finds the rate of return required on the annuity investment that equates an identical value to the AIM and the conventional mortgage.

## Properties Of AIMS

AIMs combine a home mortgage and an insurance annuity. A large portion of the down payment for a house is invested in an annuity which serves as collateral for the loan. Frank Demarais, vice president of Product Development at FNMA, states "At the end of the mortgage term, consumers will own their homes free and clear and have accumulated a significant nest egg."<sup>2</sup> The nest egg refers to future value of the annuity invested upfront that otherwise would be used as the down payment. With an AIM, the borrower's monthly payments will be higher than with a conventional mortgage and a 20 percent down payment, because less money will be put down with an AIM and more will be borrowed. For example, a home buyer who would normally put down the customary 20 percent on a house, instead would put down 5 percent and invest the other 15 percent in an annuity. If a borrower is considering a \$100,000 house, 20 percent, or \$20,000, would be a required down payment to avoid paying mortgage insurance costs, and the remaining \$80,000 would be borrowed. With an 8 percent annual interest rate, the monthly payment would be approximately \$587. Over 30 years, the

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home owner would pay \$211,324 in total payments and \$131,324 in interest charges.

An AIM, by contrast, would require a down payment of only 5 percent, or \$5,000. The other \$15,000 would be used to purchase an annuity which would serve as collateral in addition to the 5 percent down payment. The monthly payment with this AIM arrangement would be \$697, or \$110 more per month than the conventional mortgage with 20 percent down. Interest charges with the AIM would total \$155,947, and the total payments over 360 months would be \$250,947. The difference in total payments between the two mortgages is \$39,623.

Van P. Carter, president of Financial Integration Inc. which created the AIM, estimates that at a 6.2 percent rate of return (compounded monthly), the AIM annuity value would exceed the \$95,000 borrowed for the house. However, the guaranteed rates of General Life Insurance Company and AIG Life Insurance Company, the only insurers currently approved by FNMA for the program, are offering 3.5 and 4.0 percent, respectively.<sup>3</sup> After 30 years, the \$15,000 annuity would be worth about \$42,800 at an annual rate of 3.5 percent with monthly compounding, far less than \$95,000 using a 6.2 percent return. In addition, if the \$110 difference were invested in a tax-deferred annuity offering a 6.2 percent return, it would grow to \$114,820. Therefore, the value of the AIM is suspect from a valuation standpoint. In addition, the amount chosen for investment in the annuity is committed until the mortgage is repaid.

AIMs offer benefits separate from direct valuation. For example, Carter suggests that the reallocation of funds to the annuity diversifies the assets of the borrower and minimizes risk. The annuity "lowers transaction costs and provides a financial safety net."<sup>4</sup> Transaction costs are saved because the annuity serves as the alternative to mortgage insurance. Besides acting as a hedge, Carter suggests that AIMs allow investors to eventually use the money in the annuity without having to sell their house or borrow against it. Also, because home buyers are borrowing as much as 95 percent on the value of the house, instead of 80 percent, the mortgage interest deduction is larger for AIMs.

However, as some financial planners explain, AIMs are most attractive to those home buyers who just cannot save money, since they will pay a higher rate on the amount borrowed than they will earn on the annuity.<sup>5</sup> In addition, the gain on the annuity is tax-deferred, but it is not tax exempt.

Conventional AIM loans of \$203,150 are eligible for sale to FNMA using proper documentation and servicing, and loans above this amount and non-conforming loans can be sold to a restrictive group

of private secondary market purchasers, such as Kidder Peabody Capital Corporation, Capstead Mortgage Corporation and Hamilton Financial Corporation. In addition, Mortgage Guaranty Insurance Corporation (MGIC) has developed mortgage insurance coverages for AIMs, and other companies are providing the document preparation, custodial and filing services.

### Valuation Of AIMs

The net present value of AIMs is determined by comparing the present value of cash flows from a conventional mortgage with those from AIMs. Let  $L_C$  and  $L_A$  denote the interest expense from the conventional and AIM mortgages, respectively. Further, let  $P_C$  and  $P_A$  be the principal payments for the conventional and annuity mortgages, respectively. The future value of the annuity grows to  $A_F$  from a present amount  $A_P$ . The borrower's marginal tax rate is  $T$  and the monthly interest rate on both mortgages is  $i_M$ . The net present value of the AIM mortgage for a 360 month term is (1):

$$NPV_A = \sum_{t=1}^{360} \frac{(I_C - I_A)(1 - T) + (P_C - P_A)}{(1 + i_M)^t} + \frac{A_P - (A_P - A_F) \cdot T}{(1 + i_M)^{360}}$$

The first term on the right hand side of equation (1) represents the present value of the difference in the after-tax interest plus repayment expense. The second term is the present value of the after-tax dollar return on the annuity. Equation (1) can be simplified as follows (2):

$$NPV_A = (L_C - L_A) + T \cdot \left(1 - \frac{L_C}{L_A}\right) \left[ L_A - \left[ \frac{P_A - (L_A \cdot i_M)}{1 + i_M} \right] \cdot 360 \right] + \frac{A_P(1 - T)(1 + i_A)^{360} + A_P \cdot T}{(1 + i_M)^{360}}$$

In equation (2),  $L_C$  and  $L_A$  are the loan amounts for the conventional and AIM mortgages respectively,  $P_A$  is the payment on the AIM, and  $i_A$  is the monthly interest rate earned on the annuity investment.

As an example, compare a \$100,000 loan, 8 percent annual interest conventional loan with 20 percent down, with an AIM requiring 5 percent down. The AIM offers an annuity with an annual investment rate of 6.2 percent. Over 30 years, the NPV is -\$5,110 as follows (3):

$$\begin{aligned} NPV_A &= (\$80,000 - \$95,000) \\ &+ .28 \cdot \left(1 - \frac{\$80,000}{\$95,000}\right) \left[ \$95,000 - \left[ \frac{\$697.08 - \left( \frac{\$95,000 \cdot .08}{12} \right)}{1 + \frac{.08}{12}} \right] \cdot 360 \right] \\ &+ \frac{\$15,000(1 - .28) \left(1 + \frac{.062}{12}\right)^{360} + (\$15,000 \cdot .28)}{\left(1 + \frac{.08}{12}\right)^{360}} \\ &= -\$15,000 + \$3,192 + \$6,698 \\ &= -\$5,110 \end{aligned}$$

The first term on the right hand side of equation (3) represents the difference in the loan amount between the conventional and AIM mortgages, or -\$15,000. The second term captures the present

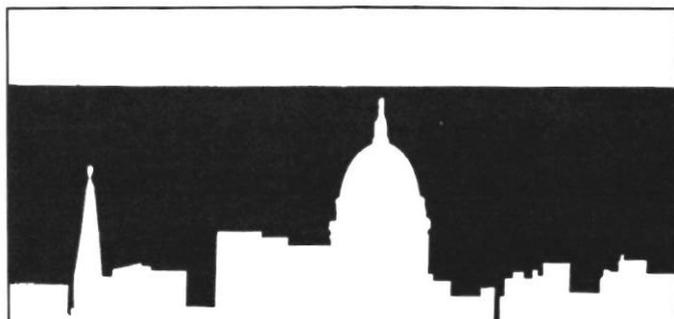
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value of the difference in the tax shield between the two mortgages. The tax shield is larger for the AIM, therefore, it reduces the negative impact on the difference in the initial mortgage amounts. The third term represents present value of the after-tax annuity. In this example, the AIM has a cost disadvantage of \$5,110 relative to a conventional mortgage.

### Finding The Indifference Investment Yield On AIMS

To find the monthly interest rate earned on the annuity investment that would make the home buyer indifferent to the conventional mortgage versus the AIM, solve for  $i_A$  with the NPV = 0, as follows (4):

$$i_A = \left\{ \frac{\left[ (L_A - L_C) - T \cdot \left( 1 - \frac{L_C}{L_A} \right) \left[ L_A - \frac{P_A - (L_A i_M)}{1 + i_M} \cdot 360 \right] \right] (1 + i_M)^{360} - A_P \cdot T}{A_P(1 - T)} \right\}^{1/360} - 1$$

Using equation (4), note that  $-\$15,000$  and  $-\$3,192$ , the first and second terms from equation (3) also are present in equation (4). Therefore, the shorthand solution is as follows (5):

$$i_A = \left\{ \frac{(\$15,000 - \$3,192) \left( 1 + \frac{.08}{12} \right)^{360} - (\$15,000 \cdot .28)}{\$15,000(1 - .28)} \right\}^{1/360} - 1$$

= .6824

Solving for  $i_A$ , the required monthly interest rate on the annuity is .6824 percent or 8.19 percent annually. In general, because taxes are paid on the gain of the annuity, the required return on the annuity will exceed the mortgage interest rate.

### Conclusion

Asset Integrated Mortgages (AIMs) are a recently developed financial instrument that combines a mortgage with an insurance annuity. The study presented in this article investigated the net present value of AIMs compared to conventional mortgages. It solved for the required return on the AIM annuity that will make the borrower indifferent between a conventional mortgage and an AIM. The findings indicate AIMs are generally negative NPV propositions with required rates of return on the annuity instrument that exceed the borrower's mortgage rate.

### NOTES

1. Winninghoff, Ellie. "Evaluating Mortgages Linked to Annuities," *The New York Times* (August 27, 1994), 29.
2. "New Asset Integrated Mortgage Can Pay You Back What You Borrowed," News Release from Financial Integration, Inc., July 26, 1994.
3. Winninghoff, *op. cit.*
4. "New Asset Integrated Mortgage. . .," *op. cit.*
5. *Ibid.*