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AND PROPER RISK SHARING

BY
SHERMAN J. MAISEL

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The Secondary Mortgage Market
and Proper Risk Sharing

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Integration of the mortgage and financial capital markets--
underway for over half a century--has speeded up dramatically in
recent years. Although market efficiency has increased, major
opportunities for improvement remain. Proper estimates of the
price for long-term risk and the call options contained in mort-
gages appear to be neglected areas of secondary market activity.
In contrast to progress in many spheres, the development of
institutions willing to accept long-term interest rate risks may
well have retrogressed. The spread between mortgages and other
capital market instruments narrowed for many years. In the past
four years, however, it appears to have widened appreciably.

My task is to comment on certain anomalies. The particular
issues I want to discuss are the sources of risks in long-term
markets, how they are priced, and how they are shared. What type
of progress has the secondary market made in developing the
institutions necessary for allowing borrowers and lenders to
assume the risks they desire with the lowest costs?

Since the number of participants in the secondary mortgage
market and their skills have been growing rapidly, we might
assume that the efficiency of the market would grow apace. Yet
it is not obvious that this has occurred. As examples, I consi-
der the introduction of consolidated mortgage obligations (CMOs)

and the growing use of adjustable rate mortgages (ARMs). Both of these instruments have multiplied because of laudable attempts by savings and loan associations, insurance companies, and pension funds to improve their risk management, and because of efforts by traders and brokers in the market to increase the marketability of their products. One result of their growth has been an alteration in how risks are measured and shared. However, these and similar changes do not appear to have improved overall operations greatly.

My conclusion is that actions to date have concentrated primarily on correcting past sins and avoiding a future debacle, not on establishing markets which can efficiently price and transfer risk. When the mortgage-related markets are judged by the standards of the arbitrage models of efficient markets, numerous shortcomings are revealed and spreads remain large. When CMOs were introduced, they were highly profitable to their issuers. The rates on ARMs seemed non-competitive for considerable periods. Autocorrelations in yields are important. Households find it difficult to obtain information as to the true risks they may bear and on how they could reduce them and at what costs. Parts of the mortgage instruments seem poorly related to their objective. Markets for important functions remain embryonic. Management decisions may be dominated by accounting and tax treatments rather than by real costs. While significant progress has been made, many neglected areas appear to offer potential opportunities for future gains.

Yields on Mortgages and Mortgage Pools

Arbitrage models of capital market equilibrium show the factors which should enter into the yields on efficiently priced mortgage instruments.* The basic rate should depend upon the yields on government bonds of a similar duration. Bond yields are equal to the current short-term riskless interest rate (say on 30- or 90-day Treasury bills) plus a differential reflected in a yield curve to compensate for added risks. This differential should cover anticipated changes in future short-term rates plus a risk premium to pay for the uncertainties of future rate movements. While the differentials between short- and long-term rates are large (over 300 basis points in recent years), unfortunately, we cannot accurately divide the gap into that portion attributable to expected changes in inflation or real interest rates and the premiums needed to pay for uncertainty risks.

To the basic government bond yields, mortgage lenders and borrowers must add additional costs. Particularly significant is the value of the call option, which borrowers obtain through being able to vary their prepayments in response to future interest movements. The mortgages and securities based upon them must also include costs to pay for origination, servicing and distribution; for default risks; and for marketing premiums. The

*Michael Brennan and Eduardo Schwartz, "Bond Pricing and Market Efficiency" Financial Analysts Journal, Sept.-Oct. 1982, pp. 49-56; Randall Pozdena and Ben Iben, "Pricing Debt Instruments: The Options Approach", Federal Reserve Bank of San Francisco, Economic Review 1983:3, pp. 19-30; Kevin Villani, "Pricing Mortgage Credit", Freddie Mac Working Paper Series No. 1, Nov. 1983

amount included in monthly or annual payments is influenced by initial premiums or discounts and their accounting and tax treatments. These various costs plus market inefficiencies have caused the spread between yields on Treasury bonds and mortgages of a similar duration to vary between 100 and 400 basis points.

Consolidated Mortgage Obligations: Splitting the Risk

One example of the continued expansion of the secondary mortgage market and the proliferation of different instruments has been the development of the CMOs. In the past six months, nearly \$5 billion worth of these securities have been issued. To what extent has this led to prices close to those predicted by the arbitrage models? Have the new instruments improved risk-sharing?

In CMOs, shorter maturities and more certain principal payments are separated from those with greater uncertainty. Typically, securities based on a pool of mortgages are issued in three or four tranches, with the first two guaranteed repayment in 5 or 10 years. Repayments on the longer-term securities begin only after the prior ones have been paid off. For example, in a recent Freddie Mac offering the expected average lives of the three tranches were 3.2, 8.6, and 20.4 years respectively. (The last was based on an assumption that holders would utilize a put to Freddie Mac at the end of 25 years and that Freddie Mac would not utilize its 20-year call.)

The securities are comparatively more attractive than existing mortgage pass-throughs because they are more like bonds. They utilize fixed coupons and sinking fund purchases rather than combined interest and principal payments, which are both variable and uncertain. Such a development improves market efficiency. The duration of mortgages and maturity risks is split, with some being shorter and safer. Investors have a greater choice to fit their needs. Marketability is enhanced.

On the other hand, a much larger share of the uncertainties is concentrated in a smaller share of the pool. Those buying the long end of the issues accept both a longer duration and less certainty with respect to its actual length. The potential variance of payments has been increased. The minimum payment schedule cannot be extended, but securities can be paid off more rapidly. If interest rates fell far enough, all obligations could be paid off at once, even though their purchasers had assumed they were buying the equivalent of a long-term bond.

The initial results from CMOs are of considerable interest. Freddie Mac was able to pay almost 100 basis points less than it was paying on pools used to cover similar pass-throughs. Improved marketability, tax and accounting factors lowered the required yield of these issues, but this does not appear to be a sufficient explanation of all of the movements in the prices of the CMOs. Market inefficiencies must have entered in. Either the prior market was inefficient or those who bought the long end of the CMOs underestimated the risks they were accepting.

Another question concerns who wants to assume the greater risks of the longer-term issues. In theory, no problem should exist, since arbitrage should set the price of the risk at exactly the rate needed to pay for it. But when we look around, it is hard to find established institutions willing to accept higher payments for taking duration and call risks.

Pension funds and insurance companies are frequently mentioned as the logical sources of such risk funds, since their liabilities are long-term and they can balance the risks. Their ability to account in terms of book rather than market values also furthers their ability to take such risks. Unfortunately, however, the market appears to have grown in such a way as to offset these capabilities. The companies and their investment managers are usually judged on their short-term investment performance. The duration of their liabilities is far below potential because poor short-term investment performance can lead to rapid withdrawals with deployment of funds elsewhere.

Because of the constant search for long-term risk bearers, the distribution of the sales of CMOs by Freddie Mac is of interest. Significant differences appear among classes of institutions with respect to the amounts they took of the two shorter instruments. But differences between holdings in the longest maturities and the total pool were minor. The small differences appear to contradict what many assume should have occurred. Pension funds, insurance companies, commercial banks, and thrift institutions all reduced their share of the long-term obligations by one or two percent compared with their share of the total.

Investment advisers, fund managers, and corporations absorbed the share of the longer tranche which the others gave up.

Adjustable Rate Mortgages

The past two years have also seen a rapid increase in the use of adjustable-rate mortgages. Borrowers are assuming the greater risks of interest rate movements as well as giving up the benefit of the prepayment option included in the traditional fixed-payment mortgage. The elimination of the prepayment option and the transfer of interest-rate risk to the individual should reduce the initial cost to the borrower. If the mortgage is properly priced, the borrower saves the premiums for future uncertainty, the need to cover up-front payments on the rising yield curve, the liquidity premium, and the cost of the option. More borrowers should be able to qualify for loans.

Clear advantages exist in offering individuals the opportunity to carry this risk if they so desire. On the other hand, a great deal of the pressure on households to assume these risks appears to arise from the unwillingness of institutions to continue to carry them rather than from the preference of individuals. There are numerous reasons for the reluctance of the institutions. These risks were probably underpriced in the past. Thrift institutions recognize a need to balance their portfolios or else to raise additional capital. Insurance and pension fund managers worry about current performance.

But does this reluctance mean that financial institutions are abdicating a key function? Their existence depends on their success as intermediaries. One of the principal needs for intermediation may lie in the risk sphere. Individuals tend to be risk-averse. In addition, they find it more difficult than intermediaries do to achieve a well-developed, balanced portfolio. Most mortgages are created at the time of a house purchase. To this extent, portfolios are somewhat balanced; yet, the house is an illiquid asset, expensive to transfer, and subject to the considerable probability that prices will not vary in conformity to the financial or labor markets. Institutions should be better equipped than households to assess and carry interest-rate risks and to price these services properly.

The Risk-Bearing Function

The question of improving the efficiency of the risk-bearing function appears to be a major one for the secondary mortgage market. Will it develop the necessary institutions to price and bear interest-rate risk? In theory this function should be no more difficult than others; yet progress toward its solution seems slower. Pension funds remain an elusive hope, while thrift institutions are diversifying out of their traditional market.

Corporate lenders should be able to bear risk efficiently. They can raise capital or borrow to offset the risks they assume. They can use organized markets to hedge their positions with options or futures. They can charge enough to achieve reimbursement for their risk-taking. They have the ability to diversify

over a broader range of assets and liabilities. They can alter their overall duration by actions on both sides of their balance sheet. Furthermore, studies show that the amount of capital required to absorb even large amounts of interest-rate risk is not great. Premiums should be low enough to make households willing to pay for risk transference.

Clearly, the question which must be asked is why the secondary market has failed to price risk properly in the past and why its current development seems slow. Part of the problem may lie in accounting and tax conventions. Traditional bookkeeping may penalize good economic decisions. We know that taxes bias the relationships between debt and equity.

To cite a specific example, only slight consideration seems to have been given to the proper price and best method for paying for the prepayment option in mortgages. What type of prepayment option should borrowers want? Should it be paid for up-front or in the annual rate? Might it not be better to pay a penalty related to the lender's actual loss if the option is used? Current practices appear illogical. Lenders have demanded penalty payments even when they had a great deal to gain from repayments. On the other hand, penalties have been well below losses when market rates fell.

A different problem arises with respect to the ability to accept the risk of future inflation. One of the key factors causing higher rates for longer-term loans may be inflationary fears. The market's ability to estimate these dangers appears low. Certainly, they were underestimated for most mortgages

issued during the 1960s and 1970s. These risks may also be unusually difficult for institutions to accept because they depend upon overall market opinion, are harder to diversify, and if judged improperly may lead to the demise of the institution.

At various times in the past, a recognition of these dangers has led to suggestions that the proper source of risk insurance on long-term interest rates should be the Federal government. It should be able to sell such risk insurance at a much lower rate than private firms. Among the arguments for federal risk-bearing in this sphere, two appear particularly relevant. One is that frequently raised with respect to deposit insurance. Basically, the risks of inflation or of certain other catastrophes are not really insurable. The dangers arise from governmental actions and therefore can only be covered by the responsible party. The second argument concerns the government's balance sheet. The Federal government is the largest debtor. Its debt costs fall with unexpected inflation. Currently, it pays very high risk premiums on its debt. A more direct sale of inflation risk insurance available for long-term mortgages and loans might be cheaper than the present practice. It could reduce uncertainties and lower long-term rates.

Concluding Remarks

The secondary mortgage market has many roles to play. A key problem has always been to find new sources of funds. Standardization and reduction of default risks were the initial hurdles. These problems were largely solved in the past decades. Market-

ability continues to present difficulties, but this too has been attacked vigorously. Important unanswered questions arise with respect to the remaining risks, particularly those found in long-term lending and in prepayment options. What are the proper prices for these risks? What changes are necessary to reduce them or to separate them out from other costs? Which firms and markets can best be altered in order to assume these risks? If the proper institutional changes come about and the costs of necessary information fall sufficiently, firms and individuals will be better able to recognize the costs of risks and the potential problems in assuming them. The market will be much improved and, hopefully, spreads will narrow once again. Participants in the secondary market cannot be complacent. The needs and opportunities for further development remain too great.

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