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THE S & L MORTGAGE PORTFOLIO DISCOUNT AND
THE EFFECTIVE MATURITY ON MORTGAGE LOANS

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the Effective Maturity on Mortgage Loans

In a recent research report, we presented and interpreted calculations of the discount from book value of the total mortgage portfolios of S & L firms in the U. S. (Balderston, 1981). For that work, we used three alternative discount rates (11%, 14%, and 17%), and two alternative assumptions concerning the effective maturity of mortgage loans. Here we explore further the implications of different effective maturities of these loans, and we examine some implications for public policy.

The Portfolio Discount Under Different Assumptions

As of December 31 1980, total long-term loan balances of insured S & L's in the U. S. were $473.3 billion. These long-term loans had accumulated over many years and had been made at previously prevailing contract interest rates and other terms. If these loans remain in force to full maturity, their discounted value will be less than book value for a discount rate higher than the contract rate. At the three alternative discount rates employed in the previous study, discounting to full maturity resulted in reductions from book value of the total U. S. loan balance of:

8.3% at a discount rate of 11%;
24.1% at a discount rate of 14%;
35.6% at a discount rate of 17%.
Although a mortgage loan may remain in force to the end of its contractual term, loans are often paid off much earlier. (Some reasons why are discussed below.) A rule of thumb for effective maturity was that a 30-year loan would last for 8-12 years. The portfolio discount is reduced, as we previously reported, if the effective maturity of loans is assumed to be one-half of full maturity, so that a new 30-year loan is expected to remain in force for fifteen years, and then its remaining balance paid off in a lump sum. An old loan with, say, ten years to run, was treated as having an effective maturity of five years.

Under this assumption, the discount from book value of the U. S. total loan portfolio of S & L's was:

- 6.9% at a discount rate of 11%;
- 21.1% at a discount rate of 14%;
- 32.1% at a discount rate of 17%.

These are appreciable, though not remarkable, reductions in the portfolio discount. The discount is reduced by one-sixth at the 11% discount rate, but by only one-tenth at the 17% rate. Shorter maturity helps more at a discount rate that is closer to the contract rate of the loans.

**The Discount at Various Effective Maturities**

We have also calculated the portfolio discount assuming a still shorter effective maturity of one-fourth the full maturity of each segment of loan portfolio. (Thus, a new 30-year loan would be assumed to be paid off in full in 7.5 years.) At a discount rate of 14%, this assumption results in a portfolio discount of 14.8% for the U. S., a reduction in the discount of almost forty percent as compared with the discount at full maturity, and thirty percent below the discount percent based on effective maturity at one-half of full maturity.
Translated into dollar terms, these portfolio discounts, all at the 14% discount rate, are:

$114.1$ billion assuming full maturity;

$99.9$ billion assuming one-half maturity;

$70.0$ billion assuming one-fourth maturity.

Figures 1, 2, and 3 show the amounts of discount below book value on the vertical axis and the number of years to effective maturity or full maturity on the horizontal axis. Each diagram displays the different amounts of discount for loans of 30-year, 20-year and 10-year stated or full maturity, at nominal interest rates of 6%, 8%, and 10%. (Figure 2 adds 12% and Figure 3 adds 14%). The discounts to effective maturities from one year to the full maturity are then shown. Figure 1 displays these relationships at a discount rate of 11%; Figure 2, 14%; and Figure 3, 17%.

A quite interesting feature of these diagrams is that approximately half of the eventual discount to full maturity is experienced by a new loan within the first five years. This relationship holds for both the 14% and the 17% discount rates, and it holds for all of the nominal rates and all three of the different full maturities. The absolute number of years of life of the loan are in fact crucial in determining the risk of interest rate loss.

Factors Shortening or Lengthening the Life of a Mortgage Loan

Several market factors may result in early pay-off of mortgage loans. If the current interest rate for new loans is less than the contract rate on an existing loan, the borrower may elect to refinance, paying off the old loan with the proceeds of the new one. Prepayment penalties are
Fig. 1: Discount from book value, by years to maturity for loans of 10-, 20-, and 30-year stated maturity. (11% discount rate.)
Fig. 2: Discount from book value, by years to maturity for loans of 10-, 20-, and 30-year stated maturity. (14% discount rate.)
Fig. 3: Discount from book value, by years to maturity for loans of 10-, 20-, and 30-year stated maturity. (17% discount rate.)
prescribed in many loan instruments in order to reduce the borrower's incentive for doing this.

Even if the current borrowing rate is higher than the existing loan's contract rate, the borrower may wish to realize financial capital when the value of the security property has risen or the old loan has a small remaining balance. The new loan, negotiated with the same or a different lender, pays off the old one and provides the needed cash.

Finally, the loan contract often provides that the remaining balance of the loan becomes "due on sale"—that is, that the loan balance must be paid by the borrower if the property is sold to another owner. In 1978 the California Supreme Court's Wellenkamp decision invalidated the "due on sale clause", and various other states have acted against the enforcement of "due on sale" provisions. We return to this issue below.

Other market conditions may lengthen the effective life of a mortgage loan. If the loan's contract rate is below the current borrowing rate, the borrower may postpone refinancing that would otherwise be attractive, or may seek another, supplemental loan while leaving the original loan in force. If the property in question is sold, the purchaser may assume the loan (if assumption is permitted) because of its advantageous terms and either put up more cash or negotiate a new loan to "wrap-around" the existing loan.

The "Assumability" Privilege and "Due-on-Sale"

Ordinarily, the lender and the borrower have differing views with respect to many particulars of the loan terms, including the "points" of origination fee, the term of years to maturity, and the contract rate of interest (if a fixed rate, what is the rate, and if variable or renegotiable, how this is done). Additional elements of the contract include prepayment
penalties, if any, and the stipulations relating to assumability or non-assumability of the loan. The borrower has incentives to request assumability and to resist, if he can, a contract provision calling for the loan balance to fall due if the underlying security property is sold to a new owner.

The value of assumability is nil to the borrower if he believes that the contract rate of the loan is higher than future market rates of interest. Once the loan contract is in force, market rates of interest may in fact rise well above the contract rate of the existing loan, as did happen from the mid-1970's on. This rise in price makes the assumability privilege on an existing loan valuable. At the time of sale of the property, the privilege has a present value equal to the discounted income stream, over the remaining life of the loan, of the differential between the current market rate at which a loan could be negotiated and the (lower) rate reflected in the existing loan contract. How the old borrower and the acquirer of the property will divide this capitalized value between them is of course subject to negotiation, but all or more of it is likely to be reflected in the sale price of the property.

Because of their general interest in keeping effective maturities short and in controlling risks, S & L's have often included a "due on sale" clause as part of their standard terms. When the lender underwrites the loan, the borrower's qualifications are carefully reviewed, including the borrower's annual income and employment stability, possession of other assets, and family status. These are material considerations at the time of loan origination, and in principle they are no less valid later on if the loan might be assumed by a successor borrower.

Legal controversy concerning the enforceability of the "due on sale"
clause has tended to narrow the basis upon which the lender can justify enforcement. If the lender could prove that the value of the property security, as collateral, is deteriorating by reason of the owner's failure to maintain it, then the lender may have reasonable cause to require that the loan be paid off. But some courts have reasoned that the lender's attempt to enforce "due on sale" merely because interest rates have gone up is improper, for it would interfere with the seller's right freely to dispose of the property. In California, the leading Supreme Court cases are Tucker v. Lassen (1974) and the more far-reaching Wellenkamp decision (1978). See Hetland (1979) for a close and sympathetic review of the legal theory.

It seems quite clear that, with future interest rates uncertain, the markets of borrowers and lenders will generally regard assumability as a valuable privilege in fixed-rate mortgages, and that the price of the privilege can be built into the loan terms (see Pratt and Campbell, 1979). What is odd about the situation that emerged in the California court decisions and in some other states is that, on existing loans that did contain the "due on sale" clause, its invalidation produced an implicit capital transfer from the lender to the first borrower, for the latter could now capture the capitalized value of assumability at the time of property sale. While variable rate mortgages or renegotiable mortgages are an answer in prospective future lending, the massive scale of the problem with respect to existing loan balances is now evident.

The Capitalized Cost of Removing "Due on Sale" and the Discount of S & L Mortgage Portfolios

If the length of life of a fixed-rate mortgage loan is extended materially beyond average expected effective maturity because "due on
sale" is void, the lending institution bears a burden and, as we have seen, the existing borrower gets a benefit. The mortgage portfolio discount estimates that were presented earlier show how large this burden may be.

It is a reasonable historical approximation of effective maturity to say that newly originated loans would remain in force for 7.5 years, or one-fourth of the typical estimated full maturity of 30 years from date of origination. When "due on sale" is void and mortgages are automatically assumable, the effective life of the loan is more frequently prolonged all the way to stated maturity. The maximum capitalized value of the cancellation of early pay-off is therefore given by the difference in portfolio discount at an effective maturity of one-fourth of full maturity and the portfolio discount at full maturity of all loans. (Because the existing portfolio contains loans of ages all the way from a few days to almost thirty years, we have applied the "one-fourth maturity" assumption to all ages of loans.) On the base of $473.3 billion in book value of mortgage portfolio balances of U. S. insured S & L's, the portfolio discount to full maturity is estimated at $114.1 billion at a discount rate of 14%. At the same discount rate, the portfolio discount on the one-fourth maturity assumption is $70.0 billion. Thus, the estimated capital value of a full stretch-out of all loans in the portfolio is $44.1 billion. This, in effect, is the maximum estimate of a capital transfer from S & L's, as lenders, to S & L mortgage borrowers.

Two other hypotheses about the size of the transfer may also be explored. The first might be called the partial stretch-out hypothesis, in that the voiding of "due on sale" might cause borrowers to postpone the payoff of loans somewhat, but other considerations would still keep the effective maturity of loans below full maturity. If the partial stretch-out raises effective maturity to one-half of full maturity, then the
estimate of the capital value of stretch-out is the difference between
total portfolio discount at one-half maturity and total discount at one-
fourth maturity. At a 14% discount rate, this is $29.9 billion, or $99.9 billion less $70.0 billion.

The second alternative hypothesis is based on the presumption that
borrowers already have heightened incentives to postpone the payoff of
loans when current mortgage rates are much higher than the contract rates
on their old loans, and these incentives are more or less proportional
to the difference between the contract rate and the currently prevailing
market rate of interest for new mortgages. If this "natural" incentive
were strong enough to cause a stretch-out from one-fourth maturity to one-
half maturity even when "due on sale" is in force, then the effect of
voiding "due on sale" may simply be to leave these loans in effect until
they reach full maturity instead of one-half maturity. Under this
alternative hypothesis, then, the total capital value is $114.1 billion
less $99.9 billion, or $14.2 billion.

Thus, we have a range of estimates: $44.1 billion at maximum, and
$14.2 billion as the smallest, under differing hypotheses about the
behavioral responses of borrowers to the elimination of the "due on sale"
provision. I would guess that the intermediate estimate of $29.9 billion
is the most plausible, but in any event, the estimated figure is a large
one.

The Federal Savings and Loan Insurance Corporation, as insurer of
the deposit liability of S & L's, would actually bear the cost of a
significant write-down in asset values of insured associations if they
are not able to survive. If the reserves of the insurance corporation are
inadequate to the task, we must expect that the U. S. Treasury and the
Federal Reserve would shoulder the residual burden. Thus, the capitalized values of between $14 billion and $44 billion that we have estimated are really to be construed as the size of a potential capital transfer from the U. S. Treasury to the population of S & L borrowers.

There is now under consideration a possible Federal law preempting the "due on sale" issue so that state laws and court decisions will not prevent enforcement of these provisions in mortgage loan contracts. If this legislation could be drawn in such a way as to shorten the average effective maturity of all existing loans to one-fourth of their full maturity, the putative saving to the U. S. government would be roughly equal to the above-mentioned capitalized value. Thus, U. S. government officials have good reason to press for Federal preemption of "due on sale" and to argue in favor of blanket preemption so that it will apply to all existing loans.

Prospective Strategies Relating to Effective Maturity

The estimates of portfolio discount that have served as the basis for the above discussion refer to the existing loan balances of the S & L industry, and they are based on the presumption that the overwhelming majority of existing loans are fixed-rate loans.

Variable-rate mortgage loans that are continuously and fully-indexed to the current long-term rate of interest would shift all interest-rate risk to the borrower and would dampen or eliminate the lender's desire to stimulate short effective maturity. Short of this polar extreme, are variable-rate loans with "Caps" and ineffective indexing, and renegotiable mortgages in which a new rate is set at three-year or five-year intervals. The latter would have nearly the full risk-shifting effect, though lags in adjustment would present some problems. Other mortgage instruments, including graduated payment loans that start at a low monthly payment amount
and then increase over time, would generally increase effective maturity, and the lender would be correspondingly more exposed to interest-rate risk unless the graduated-payment concept is combined with variable-rate indexing.

Another technique that could be considered is to expand greatly the inducements offered to buyers to pre-pay in part or in whole the principal amount of the loans they owe. Lending institutions sometimes do offer inducements now, though their hunger for reportable current income often, in the past, caused them to enforce prepayment penalties. One could imagine a series of additional devices whereby to stimulate borrowers to prepay, especially where the existing loan is old enough to contain a substantial amount of amortization in each payment already, and is therefore not attractive from the cash-flow standpoint anyway.

If the Federal Savings and Loan Insurance Corporation already faces a significant problem of underwriting the losses of an insured institution, it might provide funds to be used as bonuses for borrowers who pre-pay their loans in whole or in part, thereby freeing funds for new lending at the much higher current market rates. Whether these bonuses would have to be equal to the present value of the capital transfer is a behavioral question: some borrowers (e.g., those nearing or beyond the age of retirement) might find it attractive to reduce or eliminate the monthly payment requirements on their existing loans.

Summary and Conclusion

The effective maturity (as against full maturity) of the existing mortgage loan portfolio of the S & L industry has a very substantial effect on the size of portfolio discount that should be applied. If the effective maturity can be shortened, the amount of discount is greatly
reduced. The Federal government has a definite stake in the problem, as it is the eventual backstop insurer of the deposit liability of the S & L industry.
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