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DEPOSIT COSTS AND MORTGAGE RATES

BY

DAVID H. PYLE

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DEPOSIT COSTS AND MORTGAGE RATES

by

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Consultant, Comptroller of the Currency

October 1980

The data for this study were supplied by Professor Dwight Jaffee whose cooperation is appreciated. I have discussed this work with David Fand, Gillian Garcia, William Longbrake, and especially with James Hoag. I appreciate their willingness to listen and advise. Oded Sarig did the statistical work and the typescript was prepared by Betty Kendall.
ABSTRACT

It is frequently suggested that mortgage interest rates are determined, in part at least, by thrift deposit costs. A study by Jaffee and Rosen (Brookings Papers on Economic Activity, 1979) purports to show that "a strong element of markup pricing over deposit costs for the interest rate in mortgages appears confirmed." In this note, I show that the deposit cost variable used by Jaffee and Rosen is not significantly different from a time trend in its relationship to mortgage interest rates and conclude that the Jaffee-Rosen study does not provide evidence that justifies economic policies (e.g., Regulation Q) that depend on a link between mortgage interest rates and the cost of funds at thrift institutions.
Deposit Costs and Mortgage Interest Rates

The study entitled "Mortgage Credit Availability and Residential Construction" (1979) by Dwight Jaffee and Kenneth Rosen is a report on a five-equation model of the housing, mortgage, and deposit markets. In this note, I shall discuss their results for only the mortgage interest rate equation.

The Jaffee-Rosen Model of Mortgage Interest Rates

The Jaffee-Rosen model of mortgage interest rates is a rate adjustment model in which the change in the mortgage interest rate \( (RM) \) at a given date is equal to a constant \( (k) \) times the difference between an equilibrium mortgage interest rate at that time \( (RM^*) \) and the mortgage interest rate in the period just prior to that date \( (RM_{-1}) \):

\[
\Delta RM = k(RM^* - RM_{-1})
\]

The equilibrium mortgage interest rates is unobservable so the authors model this variable "in a reduced-form framework as a function of the exogenous demand and supply factors affecting the mortgage market." For our purposes, this reduced-form equation may be written as:

\[
RM^* = f(RG, RSL, S)
\]

where \( RG \) is the rate of interest on a marketable security comparable to mortgage debt. \( RSL \) is the effective deposit interest rate at savings and loan associations, and \( S \) is a vector of variables that "represent forces that effect the demand-supply balance in the mortgage market."
Our interest here is in the role of the saving and loan deposit interest (RSL) rate in the determination of the mortgage interest rate and, therefore, I shall not be concerned with the particular specification that Jaffee and Rosen used for market interest rates and for the quantity variables from mortgage markets. In the regression for the period 1965:3 to 1978:2 of the change in the mortgage interest rate on market interest rates, mortgage market demand-supply variables and the effective cost of deposits, Jaffee and Rosen found that the coefficient for the effective cost of deposits was positive and statistically significant (0.37 with a t-value of 4.1). From this they conclude that "a strong element of markup pricing over deposit costs for the interest rate on mortgages appears confirmed." The finding that the effective deposit interest rate was an important determinant of mortgage interest rates is controversial, as Jaffee and Rosen recognize in their report. It is controversial in terms of economic theory and for economic policy.

The Theory of Mortgage Interest Rate Determination

The effective deposit interest rate used by Jaffee and Rosen is the average effective interest rate for savings and loan associations. In their discussion of the determinants of deposit flows, the authors indicate that "In principal, a marginal rate ... would be preferable." That is also true for a neoclassical theory of mortgage interest rate determination, where if savings and loan associations were the marginal suppliers of mortgage funds we would expect their marginal cost of deposits, but not their average cost of deposits, to be a determinant of mortgage
rates. In addition to the usual differences between average and marginal rates, the "effective deposit interest rate" used by Jaffee and Rosen includes only the explicit average rate paid by savings and loan associations and is therefore influenced by Regulation Q ceilings to a greater extent than the marginal cost of deposits including implicit costs has been. Thus, there is little theoretical support for "a strong element of markup pricing over deposit costs for the interest rate on mortgages" especially when deposit costs are measured as they are in the Jaffee-Rosen study.¹

The Policy Implication of the Jaffee-Rosen Result

A major policy implication of the Jaffee-Rosen result is that lower average deposit costs at savings and loan associations result in lower mortgage costs. Thus, to the extent that Regulation Q has held down deposit costs relative to market interest rates, this regulation has supported the housing market. Clearly many policy makers have believed and

¹Benjamin Friedman (1979) commented on the theoretical basis for this mark-up pricing model: "Although some economists would object to this proposition as a description of either short-run or long-run behavior by thrift institutions, on the ground that higher deposit rates increase the supply of funds available for mortgage lending, I would not necessarily reject it in the short-run context in which profit pressures could well affect some aspect of the adjustment process of the institutions." Friedman, however, does not address the question of marginal vs. average deposit costs. Furthermore, he does not address the question of the marginal supply of mortgage funds; some economists would object to the markup pricing proposition on the ground that higher (or lower) mortgage interest rates might affect the supply of funds available for mortgage lending and thus prevent mortgage interest rates from getting out of line with market interest rates no matter what happens to savings and loan deposit costs.
continue to believe that this is the case and therefore have supported Regulation Q and currently resist the process of phasing out this regulation.\(^2\) If the Jaffee-Rosen "markup pricing" result is correct, it would support this position.

The "Effective Deposit Interest Rate" as a Time Trend

Since there is little theoretical basis for the Jaffee-Rosen markup pricing model of mortgage interest rate determination, and since the policy implications of their result are significant, it is important to examine their result more closely. Is it possible that the effective deposit interest rate (RSL) is a proxy for some other variable? Inspection of the time series of the RSL variable shows that, except for a short period in 1967–68, this variable increased with time.\(^3\) Thus, a simple hypothesis is that the effective interest rate variable is a proxy for a time trend in the Jaffee-Rosen mortgage interest rate equation.

To test this hypothesis, the RSL variable was regressed on a time trend. Two new time series, the fitted values from this regression (RSLFT) and residuals from this equation (RSLRES), were formed. The fitted values are, simply, a linear transformation of a time trend. The two new time series, which, of course, sum to give the effective deposit

\(^2\)In the May 20, 1980, minutes of the Depository Institutions De-\regulation Committee, Jay Janis (chairman of the Federal Home Loan Bank Board) opposed liberalized terms on 30 month small-saver certificates on the basis of their increased cost which "would tend to inhibit a further decline in mortgage interest rates."

\(^3\)See the appendix for this data series.
interest rate series, were both introduced into the Jaffee-Rosen mortgage interest rate equation and the effective deposit interest rate was dropped. As we can see from the Table of Coefficients and Statistics, the resulting regression is virtually identical to the original Jaffee-Rosen result. The coefficient on the fitted values (RSLFT) is positive and statistically significant (0.38 with a t-value of 4.2); it is, in fact, almost identical to the coefficient for the effective deposit interest cost (RSL) in the original regression (0.37 with a t-value of 4.1). The coefficient on the residual is small, positive, and of virtually no statistical significance (.04 with a t-value of .2). From this result, we can conclude that the relationship between mortgage interest rates and the effective deposit interest rate reported by Jaffee and Rosen is not significantly different from the relationship between mortgage interest rates and a simple time trend.

That the level of mortgage interest rates has been increasing systematically over the period 1967 to 1978 would not strike many observers as being very surprising. However, the Jaffee-Rosen result as interpreted here says more than that since the market interest rate variables that they used as independent variables are also correlated with time.

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4 Notice that the Jaffee-Rosen regression of the change in the mortgage interest rate on independent variables that include a lagged value of the percentage interest rate is not distinguishable from a regression of the level of the mortgage interest rate on the same independent variables except for the coefficient on the lagged value of the mortgage interest rate.

5 In the final regression (Pyle-Sarig 2) reported in the Table of Coefficients and Statistics, we have regressed the mortgage rate on a time trend and the residuals for all the independent variables after a linear
## TABLE OF COEFFICIENTS AND STATISTICS (t-VALUES IN PARENTHESES)

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<td>0.37</td>
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<td>-1.3</td>
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<td>0.85</td>
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### Jaffee-Roe

$$\Delta R_M = a_0 + a_1 R TB + a_2 R S - 1 + a_3 R AAA - 1 + a_4 R S L - 1 + a_5 \frac{A W E P}{P H \cdot S S P} + a_6 \frac{P A C}{P H \cdot S S P} + a_7 R M - 1$$

### Pyle-Sarig 1

Same as Jaffee-Roe except $a_4 R S L - 1$ substituted for $a_4 R S L - 1$.

### Pyle-Sarig 2

Same as Pyle-Sarig 1 except $a_2 T$ substituted for $a_2 R S L F T$ and all independent variables measured as residuals from a linear time trend.

where:

- $R TB$ = interest rate in three-month Treasury bills
- $R S - 5$ = interest rate on three- to five-year government bonds
- $R A A A$ = interest rate on Aaa corporate bonds (Moody's)
- $R S L$ = average effective deposit interest rate at savings and loan associations
- $D D P$ = level of deposits at thrift institutions
- $P H$ = quality-adjusted price index for new single-family homes
- $S S P$ = single-family housing starts
- $P A C$ = sum of new mortgage commitments issued by FHMA, FHA, and CHFA and the net change in outstanding FHA advances
- $R S L F T$ = $R S L F T + R S L H S$
So the question is what is the economic significance of the partial correlation between the mortgage interest rate and a time trend? What are the economic variables and what is the economic process that leads to a significant time trend in the Jaffee-Rosen mortgage interest rate equation despite the presence of market interest rates in that equation? I have thought of two models that could lead to this result. One approach would be to accept the basic Jaffee-Rosen rate adjustment model but to consider the possibility that the adjustment rate is not a constant over the time period. In his comment on the Jaffee-Rosen paper Benjamin Friedman discusses the short-run vs. the long-run implications of the Jaffee-Rosen model and suggests that the adjustment rate might depend "on the currently prevailing relationship between the mortgage rate and the deposit rate."\(^6\) Clearly this and related models incorporating a variable adjustment rate might be proxied by a time trend in the Jaffee-Rosen equation.

An alternative approach is to reject the rate adjustment specification and suggest that the changing relationship between market interest rates and the mortgage interest rate over the time period reflects systematic changes in term or risk differences between mortgage debt and the market interest rate proxies that Jaffee and Rosen used. These hypotheses, and probably others that I have not thought of, could explain a linear

time trend has been removed. This has almost no effect on the magnitude or the significance of any of the independent variables except for RSLRES which, as in the Pyle-Sarig 1 regression, is insignificantly different from zero.

trend in the Jaffee-Rosen equation and could be the subject of future research on the determinants of mortgage rates.

Given the autocorrelation in the mortgage interest rate series and the importance of the time trend, another mortgage finance research avenue that might be fruitfully pursued is to develop a mortgage interest rate series that better captures the economically important innovations in mortgage interest rates.

The results obtained here suggest that the Jaffee-Rosen results on mortgage interest rate determination cannot be used to justify economic policies that depend on a link between mortgage interest rates and the cost of funds at thrift institutions.
### APPENDIX

**LAGGED VALUE OF THE TIME SERIES FOR THE INTEREST RATE OF SAVINGS AND LOAN ASSOCIATIONS (RSL-1) EFFECTIVE DEPOSIT**

<table>
<thead>
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<th>1</th>
<th>2</th>
<th>3</th>
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<td>4.65</td>
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**SOURCE:** Interpolated (by D. M. Jaffee) from semiannual data from *Federal Home Loan Bank Board Journal*, various issues.
REFERENCES
