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MORTGAGE CREDIT AVAILABILITY AND THE VALUE OF NEW HOUSING

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ABSTRACT

Various studies have examined the relationship between the availability and cost of credit and the value of housing starts at the national level. The research reported here is the first to examine the effect of funds flows and interest rates on the value of housing starts in a regional market. Several measures of funds flows are used to measure the effect the changing composition of thrift liabilities, as well as interest rates, had on housing starts. The effect of monetary policy changes in the late 1970s on housing starts is also examined.

Measures of low-rate savings flows, high-rate savings flows, Federal Home Loan Bank Advances and the net change in demand and time deposits at commercial banks affected housing starts in the expected manner. Interest rates similarly had the expected effect on housing starts. Of greater interest is the finding that changes in savings flows in these categories after 1979 did not significantly alter the value of housing starts. These results suggest that recent policies deregulating interest rates on deposit flows should not affect housing starts if financial institutions can attract new funds, regardless of the level of interest rates.

INTRODUCTION

The impact of federal government policy on aggregate housing activity has been the focus of considerable attention. It is generally felt, for example, that restrictive monetary policy affects housing in the short-run by rationing mortgage credit. In recent years, Treasury financing of large federal deficits has also contributed to the high level of interest rates. That contribution has reduced the number of households qualifying for traditional mortgages. The substantial decline in housing starts since 1978 has been attributed to the relatively limited availability of mortgage credit and high, volatile interest rates.

Kearl, Rosen, and Swan (1975) summarize several studies examining the effects of availability and cost of credit on the number

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or value of housing starts. Brady (1973), Kau, Kennan, and Sirmans (1980), and Kearl and Mishkin (1977) relate the value of housing starts to the availability and cost of credit. Huang (1969), Jaffee and Rosen (1979), Kalchbrenner (1972), Maisel (1968), Sparks (1967), and Swan (1972) focus on the number of national housing starts as they relate to the availability and cost of credit. All conclude that both the cost and availability of credit are important. Arcelus and Meltzer (1973) and Meltzer (1974), however, contend that the availability of credit has little bearing on the demand for housing. While national studies exist relating the cost and availability of credit to the value of housing, none examine the relationship between credit availability, cost of credit and the value of housing starts within a regional market.

In this paper, the previous models of aggregate housing activity are extended by analyzing the impact of financial flows and the cost of credit within a regional market as it affects regional housing activity. This paper focuses on the extent to which restrictions on credit availability and changes in its cost affect the value of residential starts. It specifically examines the effect of variations in the flow of funds through financial institutions and federal credit agencies, as well as its cost, on the value of residential starts. The focus on a regional market is appropriate because these influences can be more readily discerned in subnational markets. Housing activity in a restricted geographic market should be more sensitive to financial and demographic conditions in that market than to national conditions, assuming mortgage rate ceilings and other terms are not binding. In addition to the fact that measurement problems are reduced, submarkets are frequently segmented geographically from national markets. A large proportion of funds that flow through financial institutions within a trade area typically remain within the area supporting local mortgage credit and community growth. It must be noted, however, that when credit terms are restricted, such as when usury ceilings are in force, these relationships are clouded.

This research makes two further contributions. First, it recognizes that both the structure and magnitude of funds flows were significantly altered in the late 70s. The high, volatile level of interest rates, both before and after the Federal Reserve System's move in 1979 to reserves-based monetary policy targets, significantly reduced the volume of funds acquired by savings and loan institutions (thrifts) in the form of below-market rate savings deposits. Thrifts, in turn, were forced to purchase a greater proportion of their funds at market rates via short-term, rate-sensitive liabilities. This paper examines whether this structural change in the composition of liabilities at financial institutions alters the terms at which mortgage credit is made available to customers and affects the valuation of starts.

Second, while previous studies incorporate measures of aggregate deposit flows in their models, this study distinguishes between four types of funds flows. Jaffee and Rosen (1979) examine the impact of money market certificates on national housing starts and conclude that these instruments were the primary support for housing in 1978-79. In this paper, savings accounts at thrift institutions paying rates at or below Regulation Q ceiling on passbooks are separated from savings instruments paying higher rates. This latter category

includes both money market certificates and large certificates of deposit (CDs). A third measure of funds flows is Federal Home Loan Bank advances made to thrifts. Finally, because this particular regional housing market includes a very active commercial bank acting as a mortgage banker, this study includes deposit flows at this bank as a fourth type of funds flow.

This paper is organized into three sections. Section I describes the influences of financial flows and cost of financing on the value of residential starts. Empirical tests of the relationships between these funds flows, costs and the value of housing starts for the Lubbock, Texas Metropolitan Statistical Area (MSA) are presented in Section II. Section III summarizes the results and discusses the policy implications.

SECTION I - FINANCIAL FLOWS, INTEREST RATES AND HOUSING STARTS

The role of funds flows in affecting housing starts is based on two key assumptions. The first premise is that a high proportion of total expenditures on new and existing homes is financed with mortgage credit. If not, variations in the availability of credit, while affecting lending, will contribute only partially to variations in home prices. Second, it is assumed that the availability of mortgage credit constrains housing activity in the short-run by restricting the number and value of starts and depressing the level of existing home sales, resulting in a market disequilibrium. Because the mortgage rate does not clear the mortgage market, non-price credit terms including down payment requirements, prepayment penalties and loan maturities are varied to restrict the number of buyers and to reduce the dollar value of loans.

If those assumptions hold, the dollar amount of mortgage credit available is a fundamental determinant in the rate of construction and dollar value of housing starts. Because the availability of mortgage credit depends primarily on the magnitude of funds flows to mortgage-granting financial institutions, variations in these funds flows, in turn, determine variations in the timing and value of housing starts. More precisely, if financial flows increase in magnitude, the number and dollar value of housing starts should also increase. The converse holds when financial flows decline, as when thrifts lose deposits to alternative investments (known as *disintermediation*).

The role interest rates play in determining the value of residential starts is more complex because households, thrift institutions and builders are each affected differently. For consumers, the primary influence of interest rates is affordability. High and rising mortgage rates increase the required monthly payments which may produce cash flow difficulties for home buyers. Fewer individuals can meet lenders' debt service requirements, thereby lowering the demand for housing. Low and falling rates produce the opposite effect.

From the perspective of thrift institutions, interest rates exhibit a dual influence affecting both the cost of borrowing and the return from lending. Historically, a positive-sloped yield curve and

Regulation Q interest-rate ceilings on deposits, which stabilized the cost of funds, enabled thrifts to lock-in profits because of the positive spread between mortgage rates and allowable deposit rates. However, two developments since the late 1970s changed this. First, from 1979 through 1981, the yield curve inverted to a point where short-term money market interest rates exceeded Regulation Q ceiling rates and long-term mortgage rates. The ensuing loss of below-market deposits at thrifts force these firms to purchase more expensive alternative funds. Second, thrifts were allowed to offer a variety of new savings and transactions instruments that paid market rates. Today, market rate funds account for a large proportion of thrift liabilities meaning that changes in interest rates produce significant variations in the cost of funds. Thrifts, like commercial banks, must now closely monitor maturities and repricing schedules for assets and liabilities. They must also check subsequent yield spreads to ensure that net interest revenues cover non-interest operating expenses and provide a return to shareholders.

Failed thrift institutions are normally those with negative cash flows produced by stable revenues and rising interest expense associated with the shift to relatively expensive liabilities. The recent decrease in the general level of interest rates has mitigated these problems, although many thrifts still have mismatched asset and liability maturities.

Prior to the late 1970s, increases in interest rates reduced deposit inflows at thrifts and occasionally produced disintermediation. It is the contention of this paper that the development of market rate liabilities initially enabled thrifts to substitute market rate funds for below-market deposits. Because thrifts realized relatively lower net deposit flows after rates increased dramatically, their average cost of liabilities increased more than their average asset yields. The reduction in cash flow, in turn decreased the availability of mortgage credit. Presently, rate increases can attract new deposits to thrifts, increasing the availability of mortgage credit. Mortgage rates, however, must be raised to maintain a profitable spread. The development of money market deposit accounts, super NOW accounts and the complete removal of interest-rate ceilings on all denomination deposits of more than 31 days maturity has enabled thrifts to attract substantial volumes of new funds.

Finally, builders' profits in the construction industry are tied to the cost of financing. Rising construction loan rates, which are tied to the prime rate, reduce housing starts unless the cost is offset by expected rental and resale profits from the structure. The affordability problem already discussed affects builders' abilities to pass along higher interest costs through higher prices, thus further acting to reduce starts.

Prior studies investigating the impact of financial flows and interest rates on housing have all been national in scope. Further, none examines whether these relationships have altered in recent years with the changing financial environment. This paper examines the relationships previously described within a regional market setting. It also attempts to determine if these relationships have changed structurally since 1978 (when both the level and volatility of interest rates increased dramatically).

SECTION II - EMPIRICAL TESTS: THE VALUE OF HOUSING STARTS

The empirical tests utilize data on the permit value of starts, financial flows and mortgage rates for the Lubbock, Texas MSA. The MSA represents a relatively isolated geographic market in West Texas. The closest major metropolitan area is over 300 miles away, with Lubbock businesses servicing a trade area approximately 100 miles in radius. From 1970 to 1980, Lubbock's population grew by 16 percent to almost 175,000. Total MSA population exceeded 200,000 in 1980. The MSA contains two universities which results in approximately 25,000 additional residents during the academic year and significantly affects housing activity. Since 1970, seven firms, including six savings and loan associations and one commercial bank, have dominated the mortgage market. The commercial bank effectively operates as a mortgage banker, packaging loans primarily within the trade area and selling them to institutional investors separately and through the secondary mortgage markets. Consequently, the bank's permanent mortgage portfolio represents a small fraction (.025 percent) of its mortgage-servicing portfolio. During the 70s and early 80s, these combined firms made virtually all the residential mortgage loans granted in the Lubbock market.

The financial characteristics of the Lubbock market since 1970 are similar to those in other regions. Trends in financial flows, the Lubbock mortgage rate and the value of residential permits are presented in Figures 1 and 2. The financial flows, formally defined below, are aggregate annual figures except for the first nine months of 1979. In this paper, the data are segmented after the third quarter of 1979 because both the level and volatility of interest rates increased dramatically and funds flows varied substantially after the Federal Reserve focused monetary policy on the banking system's reserves. Figures for the last two years represent annual flows through the third quarter of 1980 and 1981, respectively. On October 6, 1979, President Carter instituted selective credit controls and the Federal Reserve indicated that it would focus less on stabilizing interest rates and more on controlling reserves and money growth. Figures for the first nine months of 1979 are analyzed for comparability. Data after the third quarter, 1981, were not available at the time this study was undertaken.

Low-rate savings increased each year through 1977, except for 1974 when short-term market interest rates rose well above ceiling rates on below-market thrift deposits. Lubbock savings and loan associations realized net outflows of low-rate savings after 1977. High-rate savings, in contrast, have increased each year since 1970. The magnitude of the increase rose through 1978, then fell considerably. This drop-off occurred despite the issuance of substantial amounts of six-month money market certificates and jumbo certificates of deposit (CDs). The volume of net CD issues is indicated after 1977, the only period for which data are available.

Finally, it appears that Lubbock thrifts used Federal Home Loan Bank advances as a substitute source of funds as other flows declined. In particular, net advances vary inversely with low-rate savings through the third quarter of 1979. After 1979, advances

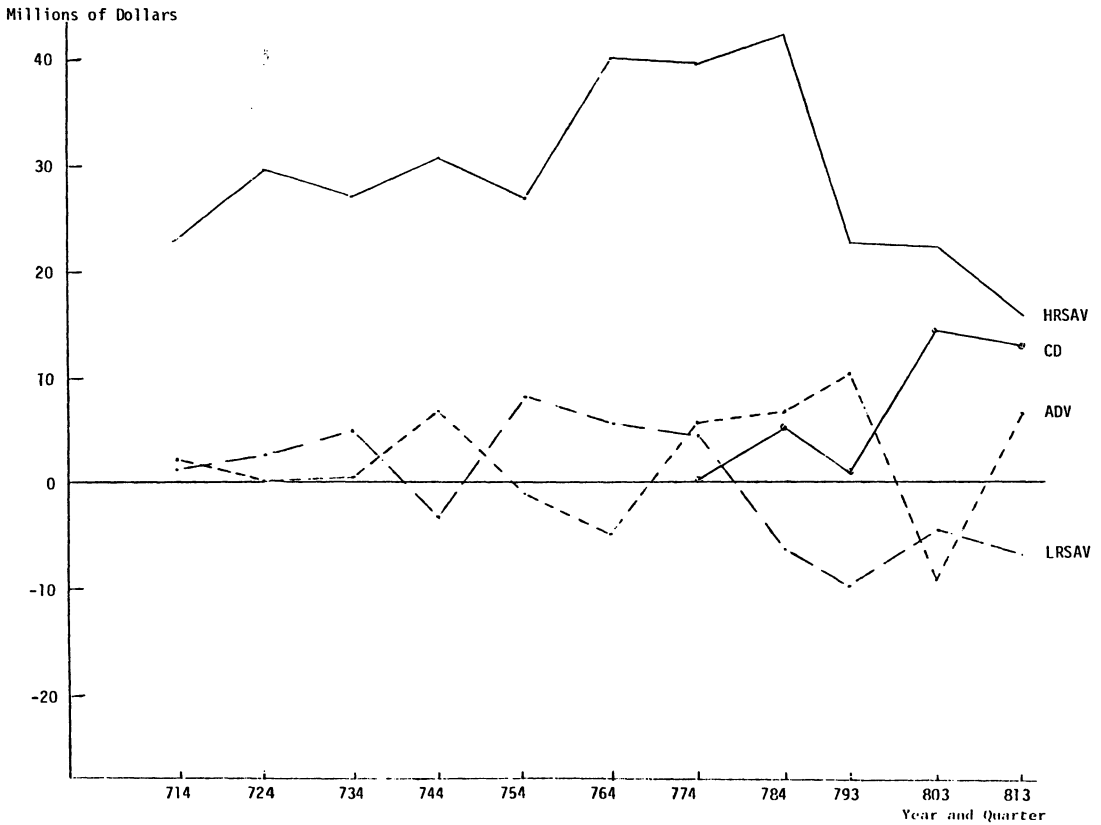

Figure 1: Financial Flows at Lubbock, Texas Thrift Institutions

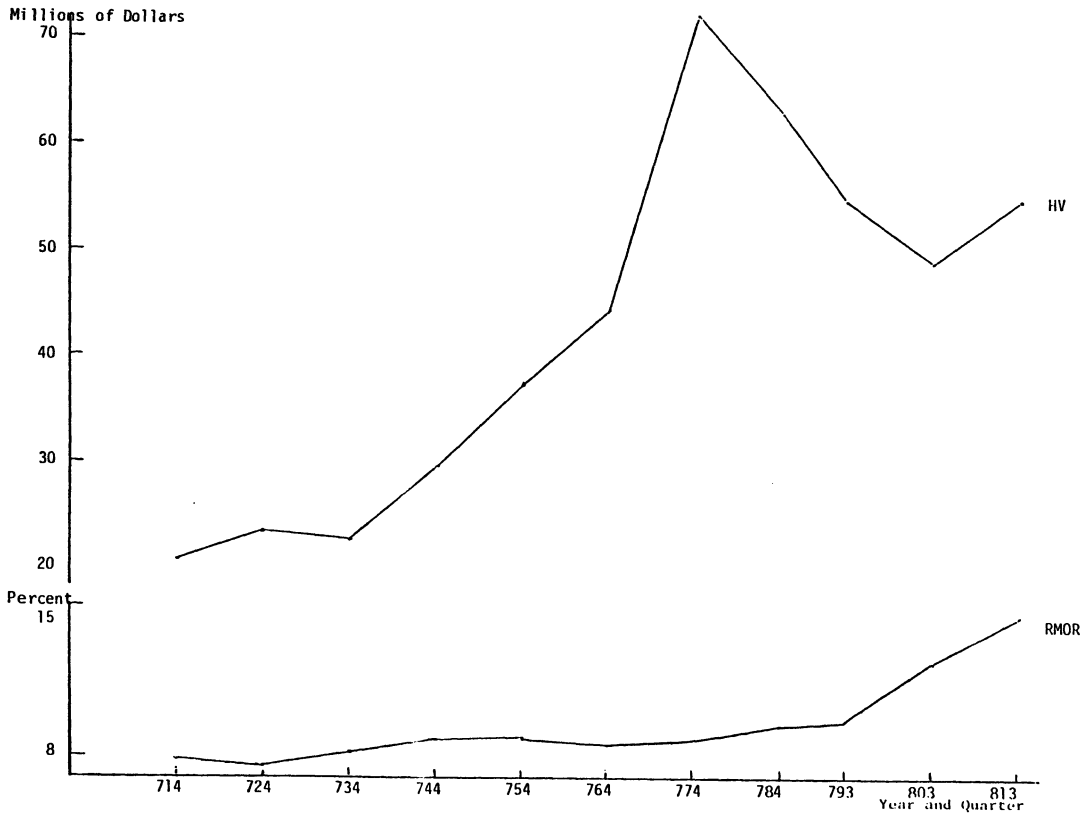

Figure 2: The value of New Single-Family Residential Permits and the Average Annual Lubbock Mortgage Rate

appear to vary with high-rate savings flows. As indicated in Figure 2, the value of new residential permits increases in each year through 1977 and then declines, particularly after 1978. Mortgage rates in Lubbock were relatively stable from 1971-1978 varying between 7.5 percent and 9.0 percent. After 1978, the rate increased to almost 17 percent at the end of 1981.

To test the relationship between financial flows and housing values, a quarterly time-series regression equation is estimated relating the value of residential housing starts to financial flows and the nominal Lubbock mortgage rate. This paper distinguishes between four types of flows: 1) the net change in savings paying below-market rates at savings and loans (LRSAV); 2) the net change in savings paying market rates at savings and loans (HRSAV); 3) the net change in time and demand deposits at the mortgage-granting commercial bank (DEP); and 4) the net change in Federal Home Loan Bank advances to savings and loans (ADV). Because there are time lags between the recognition of net funds flows and final disbursement to finance housing activity, one expects funds flows to affect the value of starts in periods beyond the present. Thus, lagged terms are included in the model. The estimated equation is:

$$HV_t = \alpha_o + \alpha_1 \sum_{i=1}^{n} w_i \, LRSAV_{t-i} + \alpha_2 \sum_{j=1}^{n} x_j \, HRSAV_{t-j}$$

$$+ \alpha_3 \sum_{k=1}^{n} y_k \, ADV_{t-k} + \alpha_4 \sum_{1=1}^{n} z_1 \, DEP_{t-1} + \alpha_5 \, RMOR_t$$

where:

HV_t = the value of new residential housing in quarter *t*, measured as the value of residential permits issued by the City of Lubbock during 1979-1981.

$LRSAV_t$ = the net change in savings accounts outstanding at savings and loans paying rates at or below the passbook rate minus interest and dividends credited during quarter *t*, obtained from Federal Home Loan Bank Board monthly reports.

$HRSAV_t$ = the net change in savings outstanding at savings and loans paying rates above the passbook rate minus interest and dividends credited during quarter *t*, obtained from the Federal Home Loan Bank Board monthly reports.

ADV_t = the net change in FHLB advances to savings and loans during quarter *t*, obtained from Federal Home Loan Bank Board monthly reports. Because data for one institution were not available after 1979, this firm's figures were deleted from the series over the entire sample period. Implicitly, it is assumed that they are a constant percentage of the total.

DEP_t = the net change in demand and time deposits outstanding at the mortgage granting commercial bank during quarter *t*. The bank was Lubbock National Bank (now RepublicBank Lubbock, which was the 20th largest mortgage bank in the country, and the largest in Texas, during the period studied.

$RMOR_t$ = the weekly average conventional mortgage rate in Lubbock during quarter *t*. It was obtained from First Federal Savings and Loan Association, the largest of the seven savings and loan associations. First Federal typically made 40 percent of Lubbock mortgage loans over the sample period.

It is expected that each of α_1, α_2, α_3, and α_4 are positive with α_5 negative and:

$$\Sigma_{w_i} = \Sigma_{x_j} = \Sigma_{y_k} = \Sigma_{z_1} = 1.$$

The value of single family housing permits (HV_t) is used as a proxy for the value of housing starts. Building permit data are often an unreliable indication of the value of starts. However, the data for Lubbock are quite reliable. Because of the growth in Lubbock over the test period and the high cost of a building permit, over 90 percent of the permits taken out resulted in new construction. The permitted value is compared to the actual selling price for a small sample of houses and the correlation coefficient is 0.92. Because permit data only include Lubbock housing, the use of equation (1) assumes that the proportion of financial flows within Lubbock used to finance housing outside of Lubbock is constant across time. The value of starts and financial flow variables is measured as the percentage change in each variable during each quarter.

The best estimates for equation (1) over the entire sample period, 1971-1981, are presented in Table 1. Summary statistics appear at the right of the table. The lagged values of the financial flow measures were entered separately in the regression. The top part of Table 1. reports the estimated cumulative effect of each type of flow over all lagged periods. The lagged values at the bottom of the table represent weights and indicate the timing of the effects. Actual parameter estimates for each lagged variable can be obtained by multiplying the weight by the cumulative estimate. Lagged values for RMOR and additional lagged values for financial flows were tested, but were excluded, either because they were statistically insignificant or were entered with the theoretically incorrect sign. Because ordinary least square estimates provided evidence of serial correlation, the equation was estimated using Cochrane-Orcutt serial correlation (π) procedure.

Serial correlation suggests that regression error terms associated with observations in a given time period are correlated with errors in the ensuing period. If uncorrected, parameter estimates are subject to greater variance than desired. The Cochrane-Orcutt procedure corrects for first-order serial correlation. Because the estimated serial correlation coefficient approximately equaled unity, the equation (1) is re-estimated in first-difference form using ordinary least

squares. Regression coefficients after adjustment are comparable to the unadjusted coefficients.

The findings suggest that financial flows and mortgage rates affect the value of housing starts in the expected manner. The coefficient estimates for the funds flow variables suggest that the value of single family starts varied by approximately 33 percent of low-rate savings flows, 49 percent of high-rate savings flows, 64 percent of the change in FHLB advances and 22 percent of increases in new bank deposits. At mean values for the flows from 1971-1981, the impact on value equals $5,800, $3.6 million, $318,000 and $1.2 million, respectively, per quarter. The coefficient estimates for the mortgage rate suggest that a one percent increase in the conventional rate, *ceteris paribus*, reduced the value of single-family starts by $2.5 million.

Tests were also conducted to ascertain whether the relationship between housing value and the financial variables changed structurally after the third quarter of 1979. The test consisted of regressing the single-family housing value measure on three types of variables: 1) the explanatory variables listed in equation (1); 2) a dummy variable (D) which has the value one in each period after the third quarter in 1979 and zero in each period prior to that; and 3) variables representing the cross-products of the dummy variable and each basic explanatory variable. (See Gujarati, 1978) Equation (1) was first estimated through third quarter 1979. Each financial flow variable was then entered as a weighted average of the lagged flow variables where the coefficient estimates for the 1971-1979 third quarter period were used to construct the weights. The empirical results do not support the hypothesis that a structural change in the financing of housing starts occurred after third quarter 1979. The t-ratios for the cross-product variables were not statistically significant at the 10 percent significance level. This would indicate that the funds flows and interest rate relationships that supported housing finance after the 1971-1978 period were not fundamentally altered after the change in Federal Reserve policy in 1979.

Table 2 presents a comparison of the estimated effects of the financial variables on the value of single-family housing starts over the two subperiods surrounding the third quarter of 1979. The estimates are constructed using the average quarterly flow or change for each financial variable over each subperiod. Not surprisingly, high-rate savings at thrifts and deposit flows at the mortgage bank provided the greatest support for single-family starts in both periods. Both low-rate savings and advances at thrifts declined on net after third quarter 1979, which offset the potential increase in housing value due to other net flows. The approximate six-percent increase in the Lubbock mortgage rate after third quarter 1979 had a similar large, negative impact on the value of starts. Finally, the importance of large CDs over the last two years is indicated by Figure 1. After third quarter 1979, net new CDs accounted for almost 60 percent of the increase in high-rate savings. Without these funds, the value of new housing starts would have declined on net after the third quarter of 1979.

Table 1. Regression Estimates of the Impact of Financial Flows and Mortgage Rates on the Value of Residential Housing Starts; Lubbock, Texas SMSA, 1971-1981*

Dependent Variable	Independent Variables						Summary Statistics			
	Constant	LRSAV	HRSAV	ADV	DEP	RMOR	R^2	SEE	π	DW
1.1 HVSF	54.72	0.330	0.494	.642	.216	-2.505 (-3.4)	.777	2.350	.98	1.68

*Figures represent the estimated cumulative effect of lagged flows. Proportionate weights for the unconstrained parameter estimates and T-statistics (in parenthesis for the lagged variables are provided below.

	LRSAV		HRSAV		ADV		DEP		
Equation	w_1	w_2	x_1	x_2	y_1	y_2	z_1	z_2	z_3
1.1 HVSF	0.658 (1.5)	0.342 (0.7)	0.672 (4.9)	0.328 (2.4)	0.612 (2.6)	0.388 (1.8)	0.319 (3.5)	0.318 (2.9)	0.363 (3.4)

Table 2. A Comparison of the Effects of Financial Flows and the Conventional Mortgage Rate on Single-Family Housing Values From 1971 to Third Quarter 1979 and Fourth Quarter 1979 to Third Quarter 1981.

	Estimated Effects (Millions of Dollars)	
Financial Variable	1971-1979 III	1979 IV - 1981 III
LRSAV	$0.105	$-0.428
HRSAV	3.911	2.372
ADV	0.441	-0.217
DEP	1.063	1.576
RMOR	-0.162	-1.932

SECTION III. SUMMARY AND CONCLUSIONS

In this study, the relationship between credit availability, cost of credit and the value of single-family housing starts is examined on a regional basis. An analysis of the aggregate value of housing starts indicates that both the supply and cost of funds had a significant impact in the Lubbock MSA from 1971-1981. This study did not find any evidence to indicate that a structural shift in the impact of funds flows and mortgage rates occurred after the Federal Reserve changed its monetary policy focus to bank reserves in the third quarter of 1979. This study also illustrates the importance of different types of funds flows and mortgage rates as they affect the value of starts. The results indicate that the major effect on value comes from high-rate savings flow changes at savings and loan associations and deposit flows at a mortgage bank. Increases in the conventional mortgage rate had a large negative impact on new starts after the third quarter of 1979. Finally, issues of jumbo CDs by savings and loan associations largely supported single-family housing after the third quarter of 1979.

The implications are that both credit availability and mortgage rates affect housing value. Recent policies deregulating interest rates on deposit flows should sustain housing if financial institutions can successfully attract new funds, regardless of the level of mortgage rates.

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