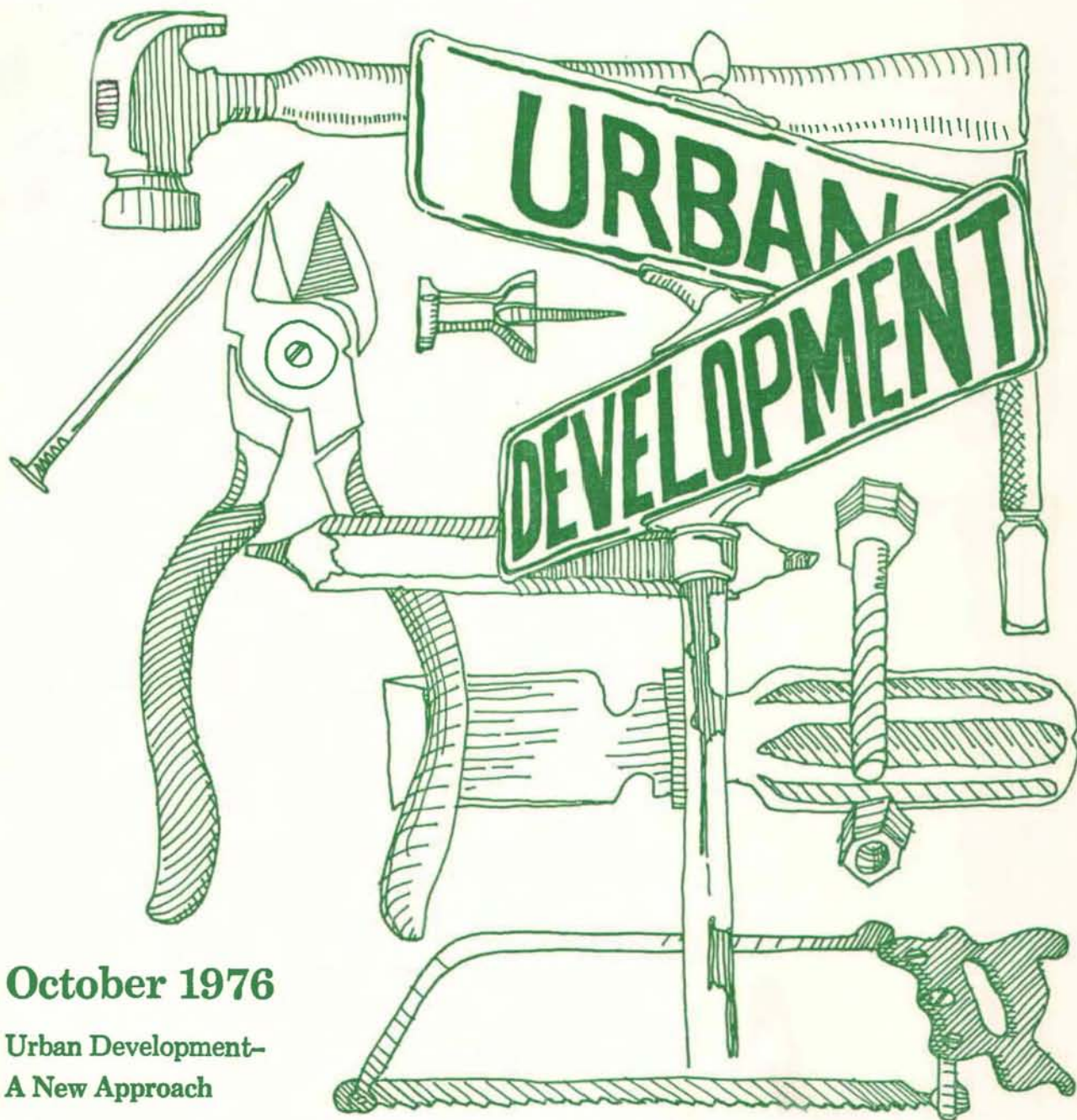Federal Reserve Bank of Dallas

Business Review

October 1976

Urban Development—
A New Approach

Interest Rates—
U.S. Government Securities
Reflect No Increase in Uncertainty

Urban Development–

A New Approach

Following World War II, Congress attempted to reorient the national economy toward peacetime domestic objectives. Legislation often took on an aura of humanitarianism in dealing with broad social problems–such as housing the poor. The national goal of assuring "a decent home and a suitable living environment for every American family" that was set forth in the Housing Act of 1949, and reaffirmed by Congress in the Housing and Urban Development Act of 1968, exemplified this mood.

Three decades later, after massive infusions of federal funds, the United States has yet to achieve this elusive social objective. To be sure, such a goal is difficult to reach. But part of the problem can also be traced to administrative shortcomings of the housing programs themselves. In response to such shortcomings, numerous communities throughout the country have established private, nonprofit corporations–called Neighborhood Housing Services, Inc.–that deal specifically with neighborhood revitalization.

Programs run by these corporations have been organized in five metropolitan areas in the Eleventh Federal Reserve District. Although they affect only one segment of the overall objective of providing adequate housing, the track record of the two programs actually in operation in the District has been encouraging.

Great Society programs

As municipalities age and expand, pressures on inner cities grow. The marketability of urban housing declines relative to housing in new suburban communities–precipitating a fall in property values. Abandonment often follows. Individual property owners become hesitant

to use private savings or incur long-term debt to refurbish their homes, and financial institutions become reluctant to make home-improvement credit available.

Housing programs of the Great Society era most often operated on the premise of tearing down to rebuild. With emphasis placed on building new structures, little legislation was aimed at arresting the decline of inner-city areas.

> **With emphasis placed on building new structures, little legislation was aimed at arresting the decline of inner-city areas.**

Some housing for families with extremely low incomes was provided through indirect subsidy programs. Public housing authorities issued bonds for the purpose of constructing new rental projects for eligible families. With the federal government assuming the responsibility for interest and principal payments on this bonded indebtedness and a portion of the debt being serviced by public funds, rental rates far below the

market could be offered. In practice, however, such projects accommodated relatively few families with extremely low incomes.

More predominant was the program whereby eligible moderate-income families were encouraged to purchase new homes through federal subsidization of their monthly mortgage payments. It was believed that if moderate-income families moved into new homes, their old homes would become available to those with less income. Then, if the structures left were razed, the upgrading process would be successful.

In many instances, however, this approach actually exacerbated urban problems by financing out-migration of the middle class. And as foreclosures often became necessary and widespread, complaints about dishonesty and fraud also seriously damaged many Great Society programs.

Another approach

As a result of the growing dissatisfaction with many federally sponsored programs, urban problems are being attacked on a more local level. Crucial elements are believed to include cooperative municipal

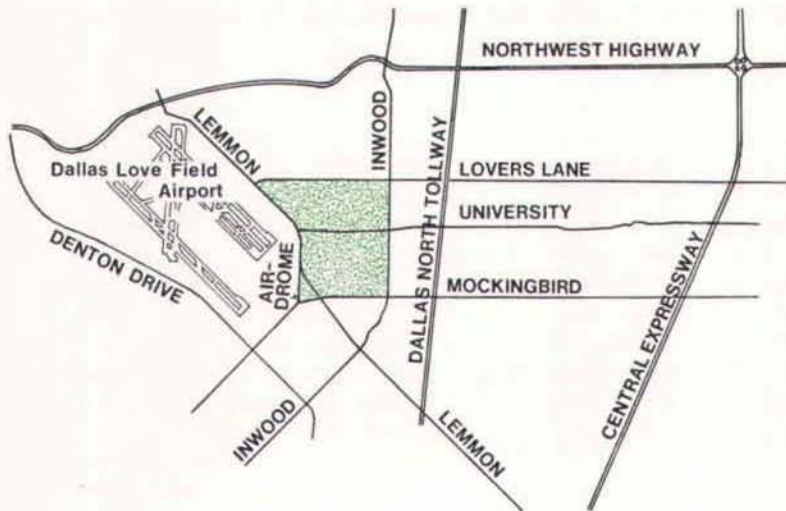**DEMOGRAPHICS OF NEIGHBORHOOD HOUSING SERVICES AREAS**

Eleventh Federal Reserve District

(Census statistics for 1970)

Item	Dallas	San Antonio[1]
Population	7,000	570
Median family income	$7,969	$4,386
Average home value[2]	$13,300	$12,129
Average monthly rent	$96	$47
Residential structures	1,753	115
Single-family	1,624	95
Multifamily	129	20
Owner-occupied structures as percent of total	60%	55%

1. Exclusive of a recently annexed area
2. For single-family, owner-occupied structures
SOURCE: U.S. Bureau of the Census

SOURCE: City of Dallas

governments, sensitive financial institutions, and, most important, responsive communities.

These three elements were successfully joined in the first Neighborhood Housing Services program in Pittsburgh, Pennsylvania, in 1968. With the objective of rehabilitating a small segment of Pittsburgh's deteriorating urban housing, financial support was obtained from the city, lending institutions, and private foundations. Since then, the same formula has been successfully applied in 26 other cities.

The Federal Home Loan Bank (FHLB) monitored the progress of the Neighborhood Housing Services program in Pittsburgh from the beginning. As the regulatory agency for the nation's savings and loan associations, the FHLB Board had been seeking ways to orient the resources of the savings and loan industry to the goals of national housing policy. And in 1972, it formally adopted the Neighborhood Housing Services program and began helping interested cities to participate.

In May 1974, in an effort to expand the scale of operations, the FHLB System joined with the U.S. Department of Housing and Urban Development (HUD) to establish the Urban Reinvestment Task Force, with HUD supplying the operating funds. The Federal Reserve System, the Federal Deposit Insurance Corporation, and the Comptroller of the Currency later assigned representatives to the task force in order to encourage the support of the institutions they regulate.

As a result of the growing dissatisfaction with many federally sponsored programs, urban problems are being attacked on a more local level.

The Urban Reinvestment Task Force plays a catalytic role in the coordination and establishment of Neighborhood Housing Services programs by passing judgment on whether the general

criteria believed necessary to ensure success are met. Local governments have to be willing to make public-service improvements (sidewalks, curbs, and parks) and to enforce minimum housing code compliance. And financial institutions must agree to make loans to qualified borrowers living in the target area. Finally, the interest of households in committing their private savings and incurring debt for refurbishment of the neighborhood needs to be forthcoming.

If these conditions are thought to exist, the task force then assists the interested city by providing workshops for the participants involved and assumes the responsibility for training the director of the local Neighborhood Housing Services program. Once these steps have been taken, the task force functions only in an advisory capacity.

The Neighborhood Housing Services organization is a state-chartered, private, nonprofit corporation. Each elects its own board of directors–usually comprised of local neighborhood residents and representatives of participating financial institutions. Policy decisions are made locally, and funding for the administrative operating budget is normally provided as a tax-free contribution by financial institutions. The administrative staff of the organization, which is usually small, counsels neighborhood residents on financial matters, monitors the construction improvements for families, and performs liaison duties with city agencies and lending institutions.

The selection of a neighborhood for rehabilitation is entirely a local decision. Basic guidelines originated by the Urban Reinvestment Task Force are usually applied during the selection process. These require that, even though showing signs of deterioration, housing stock of the neighborhood in question should be basically sound.

SOURCE: City of San Antonio

Also, at least 50 percent of the neighborhood structures ought to be owner-occupied—making it easier to engender community pride and support. And the median family income of the neighborhood should generally not be less than 80 percent of the citywide median to ensure that residents will be able to afford at least minimum renovations.

Because a number of residents of the selected neighborhood are usually unable to obtain conventional financing, each Neighborhood Housing Services organization has established a revolving loan fund from which credit may be extended to high-risk households. Contributions to this fund flow primarily from charitable foundations, but contributions of city governments and local private corporations have been increasing in importance.

In several cities where Neighborhood Housing Services programs have been in operation for some time, the high-risk loan funds have been drawn down considerably. In 1974, Neighborhood Housing Services of America, Inc.,

was established to help avoid a shortage of credit for high-risk loans. Using a $250,000 grant from HUD, it purchases high-risk loans from local Neighborhood Housing Services organizations.

Success in Eleventh District

The Neighborhood Housing Services program in Dallas has been modeled largely on the successful Pittsburgh experience. A unique feature, however, is that commercial banks were invited into the program at the outset, whereas the Pittsburgh program was coordinated solely through the efforts of local savings and loan associations. Interest in establishing a Neighborhood Housing Services program in the city of Dallas was manifested in February 1973, and chartering of the nonprofit corporation took place on May 5.

The area selected out of the many surveyed was a neighborhood characterized by an out-migration of the white middle class. When selected, the targeted area had a 77-percent black population. The median family income of the neighborhood, which had

been developed in the late 1940's and early 1950's, was $7,500. In addition, it contained 2,500 residential structures, 1,700 of which were judged substandard by the city building inspectors.

The city of Dallas committed $1.2 million in funds to be used for renovations of alleys and for new parks and streetlights. Financial institutions, in addition to agreeing to accommodate bankable loans, gave the Neighborhood Housing Services organization a $50,000 standing commitment to cover annual administrative staffing costs. The Ford Foundation has been the primary contributor to the high-risk revolving loan fund, agreeing to pledge $1 for every $2 contributed locally up to a $100,000 ceiling.

The Dallas effort has enjoyed marked success. Since May 1973, renovations costing an estimated $928,000 have been made by local residents. Bankable loans have totaled $206,000, and 33 loans valued at $160,000 have been either paid or committed out of the high-risk fund. Moreover, the city of Dallas recently pledged $140,000 of Community Development Revenue Sharing Funds to the high-risk fund for fiscal 1976, allowing the Ford Foundation to complete its $100,000 donation. Program coordinators believe this project area may be completely renovated within the next 12 months, and establishment of a new Neighborhood Housing Services organization for another part of Dallas is now being studied.

Another Neighborhood Housing Services organization in the Eleventh District formally became operational in San Antonio in April 1975. Progress during the first year, though somewhat below expectations, has been significant. The original target area for the rehabilitation effort in San Antonio covered 10 blocks containing 115 residential structures and seven

ESTIMATED COST OF NEIGHBORHOOD RENOVATIONS

Eleventh Federal Reserve District

Source of funds	Dallas (May 1973- August 1976)	San Antonio[1] (April 1975- August 1976)
Municipalities	$1,200,000	$150,000
Personal savings[2]	562,000	30,000
Known bankable loans	206,170	15,000
Committed high-risk loans	159,957	4,000
Total	$2,128,127	$199,000

1. Exclusive of a recently annexed area
2. Includes estimates of unreported bankable loans made
SOURCES: Neighborhood Housing Services of Dallas, Inc.
Neighborhood Housing Services of San Antonio, Inc.

commercial and institutional buildings. City building inspectors considered 57 percent of the residential structures substandard. The median value of the owner-occupied units was estimated to be $8,000, while the median family income was almost $4,400.

The Dallas effort has enjoyed marked success. In San Antonio, progress during the first year, though somewhat below expectations, has been significant.

The city, for its part, committed almost $150,000 to municipal improvements, all of which have been completed. The Ford Foundation, which pledged a total of $150,000 for the high-risk loan fund, delivered the first $50,000 instalment in September 1975. Only $4,000 in high-risk loans and $15,000 in bankable loans have been generated thus far. As in some other projects, many residents—particularly elderly ones—have preferred to finance their home improvements by drawing on accumulated savings. Neighborhood renovations financed by personal savings of local residents have totaled $30,000 to date.

Plans have been finalized to expand the target area in San Antonio from 10 to 91 blocks. The city has already allocated $432,000 for municipal improvements in the new area. A larger percentage of the homes in the expanded area are rented, which will present more of a problem of absentee ownership—but one no larger than already experienced and overcome in Dallas.

Future of the programs

Additional Neighborhood Housing Services organizations in the Eleventh District are in developmental stages in Fort Worth, Galveston, and Houston. In the nation as a whole, it is expected that 31 such organizations will be functioning by year-end. The Department of Housing and Urban Development recently announced it will increase funding of the Urban Reinvestment Task Force from $2.5 million to $4.5 million in fiscal 1977. With this increased funding, it is likely that 100 Neighborhood Housing Services programs may be operating by 1980.

If this expansion is realized, modification of the initial concept may be necessary. Questions have arisen as to future sources of funding. Financial institutions may be reluctant or unwilling to cover the full administrative costs of expanded Neighborhood Housing Services staffs. And foundation contributions may fall short of the levels required for the establishment of a viable high-risk fund.

At present, the Urban Reinvestment Task Force is monitoring experiments with two Neighborhood Housing Services organizations where Community Development Revenue Sharing Funds are being used by city governments to supplement or replace funds from private sources. If the expansion of city government's role from mere support to direct participation creates no serious repercussions, the outlook should be brighter.

—Michael J. Minihan*

*Economist, San Antonio Branch, Federal Reserve Bank of Dallas

New member banks

First National Bank of Pearland, Pearland, Texas, a newly organized institution located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, opened for business September 2, 1976, as a member of the Federal Reserve System. The new member bank opened with capital of $400,000, surplus of $400,000, and undivided profits of $200,000. The officers are: Victor C. Bane, President; William E. Jacobson, Vice President and Cashier; and Vonna B. Banks, Assistant Cashier.

Braes Bayou National Bank, Houston, Texas, a newly organized institution located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, opened for business September 15, 1976, as a member of the Federal Reserve System. The new member bank opened with capital of $400,000, surplus of $400,000, and undivided profits of $200,000. The officers are: I. S. Brochstein, Chairman of the Board; Charles C. Womack, President; and William D. Klein, Cashier.

New par bank

First Bank of Snook, Snook, Texas, a newly organized insured nonmember bank located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, opened for business September 7, 1976, remitting at par. The officers are: Rayfield O. Slovacek, Chairman of the Board; C. C. Chamberland, President; Earl Sebesta, Vice President (Inactive); and Clint A. Sebesta, Cashier.

U.S. Government Securities Reflect No Increase in Uncertainty

One influence on economic activity is the amount of uncertainty people feel regarding future events. Unfortunately, uncertainty is a subjective concept and not directly measurable. But it is commonly believed that the degree of uncertainty individuals attach to an economic measure is closely related to its historic variability. By this standard, uncertainty in money and capital markets has increased in recent years.

For example, the average change in the quarterly average rate on three-month Treasury bills rose from 32 basis points in the 1954-70 period to 72 basis points in the 1971-74 period. And on average, the quarterly change in the Aaa corporate bond rate was only 14 basis points in the first period but 21 basis points in the second.

Increased uncertainty about future levels of interest rates could influence the term structure of interest rates—the relationship between yields on securities of different maturities. And the composition of the economy's output could be influenced by changes in the term structure if different categories of investment spending respond to interest rates of different maturities. However, even if there were no perceptible impact on the composition of final demand, a change in the term structure could still influence financing decisions and, therefore, the structure of balance sheets.

For example, an increase in long-term relative to short-term rates would create an incentive to borrow relatively more short-term funds. But without a corresponding change in the composition of assets, income flows would be less

closely related to debt repayments and balance sheets would deteriorate. Serious cash flow problems could result.

Increased uncertainty about future levels of interest rates could influence the term structure of interest rates—the relationship between yields on securities of different maturities.

If, in fact, there has been an increase in uncertainty, it might be reflected in changes in the size of risk premiums in the term structure of interest rates. Whether uncertainty affects these risk premiums—and, if so, to what extent—depends, in part, on which of several alternative explanations of the term structure is correct. But based on the most commonly accepted explanation, no convincing evidence is found to support the view that the U.S. Government securities market has been affected by greater uncertainty in recent years.

Pure expectations theory

The pure expectations theory holds that in market equilibrium, and for a given period of investment, yields on investments of different maturities should be equal. If the returns that can be obtained over any time period from alternative investments diverge, investors will switch between them until the equality is restored.

Suppose, for example, the current yield on a security maturing in two months is 5 percent. The pure expectations hypothesis holds

that an identical rate of return could be obtained by holding a series of two one-month securities. If the yield on the two one-month securities is expected to be less than 5 percent, investors will move out of them and into the two-month security until the returns are equal.

The pure expectations model stresses the high degree of substitutability between maturities and implies an absence of premiums or discounts according to maturity. It is assumed that the market is dominated by risk-indifferent investors that are willing to select among alternative investments solely on the basis of differences in expected holding-period yields.

Other theories hold that transactions costs and risk aversion limit substitution sufficiently to disturb the equality of returns. In these other theories, the average yield to maturity on a bond equals an average of the current and expected one-period future rates plus a risk premium, which may be positive or negative.

Preferred habitat theory

The preferred habitat theory holds, for example, that no *a priori* statement can be made about the maturity pattern of risk premiums. According to this theory, the yield structure is determined primarily by expectations of the future course of interest rates, but it is likely to be modified by the effects of transactions costs and risk aversion. Both borrowers and lenders are assumed to have a preferred maturity range. These maturity preferences arise from the desire of borrowers and lenders to hedge

by matching the maturity composition of their assets and liabilities.

For a lender, the preferred maturity corresponds to the period for which he expects to have funds available to invest. Only investment in a bond of this maturity carries a return that is certain and, therefore, is riskless.

According to the preferred habitat theory, the yield structure is determined primarily by expectations of the future course of interest rates, but it is likely to be modified by the effects of transactions costs and risk aversion.

The return from a series of shorter-term investments is uncertain because the rate at which the proceeds of each maturing investment can be reinvested is unknown. And the purchase of a longer-term security also entails an uncertain total return because of lack of knowledge about the price at which the security will be sold. Transactions costs also create an incentive for an investor to select a security with maturity equal to that of his preferred habitat since other maturities involve higher transactions costs and, therefore, lower effective yields.

If the maturity preferences of those selling securities and those buying securities were exactly the same, no risk premiums would exist. However, differences in these preferences should ordinarily result in premiums in maturities where preferred supply exceeds demand and in discounts in maturities where preferred demand exceeds supply.

Liquidity premium theory

The liquidity premium theory asserts that risk premiums will exist and depend on the same general factors as in the preferred

habitat theory. But the liquidity premium theory holds that the premiums rise steadily with increasing maturity.

It is assumed that most lenders are more averse to the risk accompanying the sale of a long-term security prior to maturity at an uncertain price than to the risk accompanying reinvestment of funds at an uncertain rate in a series of short-term securities. Consequently, most lenders prefer short-term investments. Since the risk of holding longer-term investments increases with the term to maturity of a bond, lenders demand a premium that rises with the maturity of the loan.

Estimating risk premiums

Estimates of the pattern of risk premiums according to maturity

provide a method of distinguishing between the alternative theories of the term structure of interest rates. However, estimation of the premiums requires information on market expectations. Because direct measures of expectations are generally not available, economists have constructed models of the way in which expectations are formed and then applied these to available data to construct values for the unobserved expected interest rates.

Application of one such model, where the expected value of an economic variable one period hence is equal to a weighted average of its current and past values, leads to equations for the term structure in which the long-term rate of interest is explained by a weighted average of current and

Risk premiums on Government securities generally no higher in period of presumed greater uncertainty
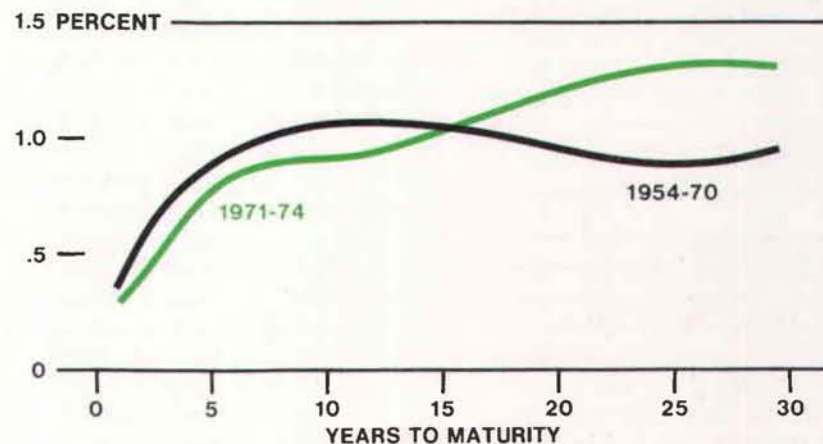
Period	Years to maturity							
	1	2	3	4	5	10	20	30
1954-70 ...	.36	.54	.71	.82	.88	1.06	.95	.96
1971-74 ...	.31	.36	.55	.67	.78	.90	1.20	1.28

NOTE: Equations for the term structure were estimated with third-degree unconstrained polynomials and an 18-quarter lag on data covering the period from the second quarter of 1954 to the fourth quarter of 1974. A dummy variable was included to allow the constant term to shift between these two periods and, hence, capture different risk premiums.

past short-term rates. Given estimates of the weights on short-term rates, the risk premium for any long-term rate can then be obtained also.[1]

For the 1954-70 period, the estimated risk premiums on U.S. Government securities rise to a peak at ten years to maturity and then decline for longer maturities. The existence of such risk premiums is inconsistent with the pure expectations hypothesis, while the pattern of premiums is inconsistent with the liquidity premium hypothesis. However, both are consistent with the preferred habitat theory.

Effect of greater uncertainty

Greater uncertainty, if not accompanied by any other influences, would be expected to result in an increase in risk premiums over all maturity ranges. The effect should be most pronounced in the intermediate range.

When the recent variance of short-term rates is introduced into equations explaining the term structure in the Government securities market, it has no explanatory power.

However, the estimated premiums for 1971-74–the period with presumed greater uncertainty– have ambiguous implications. Although they are higher than in the earlier period for the longest maturities, they remain unchanged for the shortest and fall in the intermediate range.

This pattern could be the result of the uncertainty effect operating

as anticipated but being overwhelmed by changes in other factors that affect risk premiums– including changes in the maturity composition of the supply of securities, changes in the maturity distribution of habitat demand for securities, and the like. On the other hand, it could be that the increase in uncertainty has simply not been great enough to enlarge risk premiums significantly in the market for U.S. Government securities.

An alternative test procedure is to include in the equations explaining the term structure a variable that is an explicit measure of uncertainty. The risk premium may change in response to a variety of influences, and this alternative approach has the advantage of attempting to isolate the effect to be examined. But it also has the disadvantage of requiring a simultaneous test of two hypotheses: that the constructed variable is a good proxy for uncertainty and that uncertainty influences the yield structure. If the measure performs well, both hypotheses are supported. If it does not, there is no exact way of allocating the blame between the two hypotheses.

A measure that has been used in other studies to support the hypothesis of significant uncertainty effects is the recent variance of short-term rates. When short-term rates are fluctuating widely, it should be more difficult to forecast future rates on the basis of their past behavior. This would reduce the confidence investors hold in their expectations of the future and thereby increase their preferences for maturities

matching their riskless habitats. An increase in these preferences, if strong enough, could result in a measurable increase in risk premiums. Nevertheless, when the recent variance of short-term rates is introduced into equations explaining the term structure in the Government securities market, it has no explanatory power.[2]

Summary and conclusions

The tests reported here fail to find that uncertainty has a significant effect on the term structure of interest rates for the U.S. Government securities market. By contrast, other studies have found uncertainty to have an important effect on the term structure in the market for private securities.[3] However, differences in empirical results are to be expected if the markets from which the data are drawn differ in important respects.

It is quite possible that arbitrage operates to a greater extent in the public securities market than in the private. Some institutions–particularly commercial banks– hold Government securities over a broad maturity range and are willing to make changes in the composition of their holdings to maximize expected yields.

It is quite possible that arbitrage operates to a greater extent in the public securities market than in the private. Some institutions–particularly commercial banks–hold Government securities over a broad maturity range and

1. The method of solving for the risk premiums is from Richard C. Sutch, "Expectations, Risk, and the Term Structure of Interest Rates," Ph.D. dissertation, Massachusetts Institute of Technology, 1968. This method and the estimating equations used are discussed in the accompanying technical appendix.
2. The details of this test are described in the technical appendix.
3. See Franco Modigliani and Robert J. Shiller, "Inflation, Rational Expectations, and the Term Structure of Interest Rates," *Economica*, February 1973; and Rose McElhattan, "The Term Structure of Interest Rates and Inflation Uncertainty," *Economic Review*, Federal Reserve Bank of San Francisco, December 1975.

are willing to make changes in the composition of their holdings to maximize expected yields. If there is less such arbitraging in the market for private securities because maturity preferences are more well defined there, then uncertainty could influence the term structure in the private but not the public market.

This interpretation is consistent with recent empirical evidence of the impact on the term structure of changes in the maturity composition of debt. Studies of the Government securities market have found, at best, a small role—confined primarily to the short end of the market—for changes in the maturity composition of the Government debt.[4]

This suggests that maturity preferences are relatively weak in the Government securities market, allowing changes in the composition of debt to be absorbed without marked changes in the yield curve. A lack of strong maturity preferences in this market would also mean that uncertainty would not be expected to have an important effect on the term structure of interest rates.

–Steven W. Dobson

4. See, for example, Franco Modigliani and Richard Sutch, "Debt Management and the Term Structure of Interest Rates: An Empirical Analysis of Recent Experience," *Journal of Political Economy,* August 1967.

Technical appendix

A general formulation of the expectations hypothesis is given by:

$$(1) \qquad R(m)_t = \frac{1}{m} \sum_{k=0}^{m-1} {}_t r^e_{t+k} + Y(m)_t$$

where $R(m)_t$ is the average yield to maturity at time t on a bond maturing in m periods, ${}_t r^e_{t+k}$ is the current and future one-period rates expected at time t to prevail in periods $t+k$, and $Y(m)_t$ is the risk-premium term—defined as the amount by which the yield on the m-period bond exceeds or falls short of the average of expected one-period rates.

Application of a distributed-lag model of expectations formation to the expected future rates appearing in (1) allows the equation to be expressed entirely in terms of current and past values of the one-period rate. A linear combination of weights is applied to current and past values of a variable to obtain an expectation one period hence. Forecasts for periods further removed from the present are obtained through recursive application of the same weighting scheme. The result is an equation in which the long-term rate is explained by a distributed lag of current and past values of the one-period rate, as:

$$(2) \qquad R(m)_t = \sum_{i=0}^{\infty} \beta(m)_i r_{t-1} + Y(m).$$

The weights here are an average of the weights used in forming one-period rates over the life of the bond. The distributed-lag weights should sum to unity. This property is necessary for the model to yield unbiased forecasts from a trendless series. Equation (2) cannot be estimated as it stands since we lack an infinite number of observations to estimate the infinite distributed lag.

One solution, suggested by Richard C. Sutch, is to postulate that all rates further in the past than some period n can be approximated by an average r^*.[1] Such an approach is rationalized on the grounds that investors are unlikely to have more than a vague recollection of rates far in the past.

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[1] "Expectations, Risk, and the Term Structure of Interest Rates," chapter 4

Moreover, if rates have not fluctuated severely and if n is chosen sufficiently large, the average r^* may be supposed not to fluctuate and, thus, may be taken as a constant.

Some models of expectations formation imply that the coefficient of the contemporaneous short-term rate should not be forced to lie on the same polynomial as the remainder of the coefficients. The coefficient of the current short-term rate, therefore, should be estimated separately from the remainder of the distributed lag. These considerations allow (2) to be written as:

$$(3) \qquad R(m)_t = \beta(m)_0 r_t + \sum_{i=1}^{n} \beta(m)_i r_{t-1} + C(m).$$

Given estimates of the parameters in this equation, it is possible to derive the estimated risk premium $Y(m)$. Since the distributed lag—which, in principle, is infinite—is truncated in (3), the constant term is an estimate of:

$$C(m) = \sum_{i=n+1}^{\infty} \beta(m)_i r^* + Y(m).$$

Since the sum of the lag weights from $i=0$ through infinity should be unity, it follows that:

$$C(m) = [1 - \sum_{i=0}^{n} \beta(m)_i] r^* + Y(m)$$

and

$$Y(m) = C(m) - [1 - \sum_{i=0}^{n} \beta(m)_i] r^*.$$

Given estimates of $C(m)$ and the sum of the weights from $i=0$ to n, it is, therefore, possible to obtain estimates of $Y(m)$.

The data used to estimate (3) are quarterly averages of monthly observations for maturities of 1 through 5, 10, 20, and 30 years from yield curves prepared by Salomon Brothers. The one-period rate is represented by a quarterly average of the three-month Treasury bill rate converted to a bond-yield equivalent. It is assumed that r^* is 3.6, the average value of the bill rate over the entire 1949-74 period.

A more elaborate term-structure equation than this is used in the Federal Reserve-

MIT-PENN econometric model of the U.S. economy. It includes a distributed lag on current and past rates of inflation and a variable representing the recent variance of short-term interest rates.

The distributed lag on the rate of inflation is included in the FRB-MIT-PENN model to account for the fact that, in equilibrium, the nominal rate of interest equals the real rate plus the expected rate of inflation and that the weights used by investors to form expectations of the inflation rate may differ from those used in forming expectations of the real rate of interest. Although this version provides a more accurate representation of the mechanism determining the term structure, it was not used here in order to simplify the presentation. However, our results were replicated without any important change in equations that included a distributed lag on price changes.

The recent variance of short-term interest rates fails to explain any of the term structure of rates in the Government securities market when the appropriate correction is made for serial correlation in residuals. This is in marked contrast to the equation in the FRB-MIT-PENN model, in which the recent variance of short-term rates helps explain the linkage between the rate on four to six-month commercial paper and the Aaa corporate rate. These results for the Government securities market, estimated here for the 1954-70 period, are shown in the accompanying table.

The variance used is a moving average of current and past values of the three-month rate relative to its own recent average. The weights used to construct the weighted-average variance measure and the weighted mean were both assumed to follow a diminishing geometric pattern over eight quarters, with the initial weight equal to .75.

When this variance measure is entered into the distributed-lag equations, an apparently positive effect on risk premiums is observed. But the Durbin-Watson statistic reveals strong positive serial correlation, which may result in a downward bias in the estimates of the standard errors of the coefficients. If the bias is severe enough, it could incorrectly be concluded that a coefficient is positive, whereas the coefficient is actually zero or negative.

To correct for this possible bias, the equations were reestimated with a correction for serial correlation. It was assumed that the errors follow a simple first-order process. The parameter of serial correlation was found by searching through the domain of plus and minus unity for the value that minimized the standard error of estimate. The estimated coefficients of the variance measure, when correction is made for serial correlation, appear in the second line of the table. The coefficients are no longer uniformly positive. More important, the standard errors are too large relative to the coefficients to allow any reliable statement about the sign, much less the magnitude, of the latter. The coefficients of the other variables in the distributed-lag equations showed no important change. Regressions performed for other sample periods yielded similar results.

ESTIMATED COEFFICIENTS OF RECENT VARIANCE OF SHORT-TERM RATES

Estimated with	Years to maturity of long-term rate							
	1	2	3	4	5	10	20	30
Ordinary least squares	.46 (.10)	.58 (.12)	.65 (.13)	.65 (.14)	.62 (.14)	.44 (.12)	.37 (.09)	.30 (.09)
Correction for serial correlation ...	.06 (.13)	−.01 (.16)	.03 (.17)	−.02 (.17)	−.05 (.17)	−.01 (.14)	.02 (.13)	−.03 (.12)

NOTE: Figures in parentheses are standard errors of the coefficients.

Eleventh District Business Highlights

PESO DEVALUATION

The devaluation of the Mexican peso on August 31 has affected the overall economy of the Eleventh District only slightly. But it had an immediate and, in many cases, severe impact in cities on the border.

Last year, some 2.1 million Mexicans crossed the border to purchase U.S. goods and services worth approximately $1.3 billion—almost a fourth of the total U.S. income from tourism. Many of those sales were rung up in the Eleventh District and were the heart of business activity along the border.

Retail sales to Mexican nationals have evaporated since the value of the peso dropped from 8 cents to about a nickel. For example, in El Paso—the biggest border city in the District—many merchants report that total sales since the first of September are off as much as a third. Some establishments have been forced to pare their inventory levels and sales staffs and cancel orders for new merchandise. Moreover, many Mexicans have canceled layaway purchases and sought extensions on existing credit purchase agreements.

Major beneficiaries of the peso devaluation, however, have been the U.S. manufacturers participating in Mexico's border industry program. These twin-plant operations, which are allowed to import materials duty-free from the United States and ship assembled products back across the border, had been losing much of their competitive edge because of the rapid inflation in Mexican wage rates.

The minimum wage in Mexico nearly doubled from 1973 to 1975. With the devaluation, however, labor costs to the U.S. manufacturers have dropped almost 40 per-

cent. Prior to the devaluation, several manufacturers had planned to close. Now, they indicate they will reassess their positions.

Much of the twin-plant payrolls has been spent in District cities. For example, it is estimated that of the $69 million annual payrolls of the plants in Ciudad Juarez before the devaluation, about a third was spent directly in El Paso. And ultimately, 70 percent of these payrolls wound up in the El Paso market area. As the twin-plant program expands at a faster pace, retail sales to Mexican nationals should tend to quicken in the Eleventh District.

Another beneficiary of the devaluation was MexFair '76, the Mexican trade fair held in San Antonio in September. The fair was the first major test of the Mexican government's decision to seek improvement in the competitiveness of Mexico's products through a devaluation of the peso.
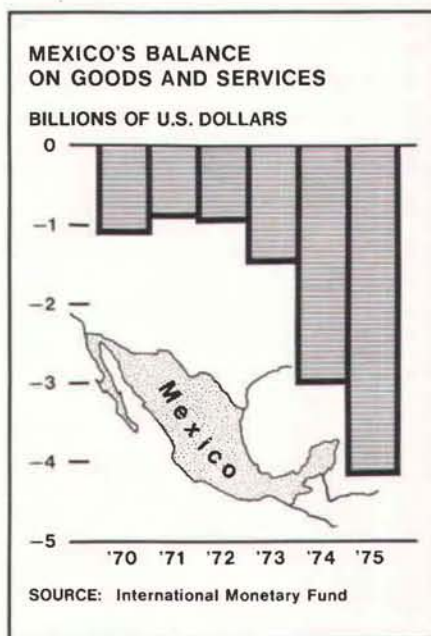
MEXICO'S BALANCE ON GOODS AND SERVICES

BILLIONS OF U.S. DOLLARS

SOURCE: International Monetary Fund

New orders at MexFair '76 were estimated to total $133 million, or 65 percent higher than last year. This volume of bookings was expected to be translated into final sales within a month. In addition, Mexican officials estimated that follow-up orders in the coming year may push total sales as high as $200 million.

As a result of deteriorating economic conditions, rumors of an impending devaluation of the peso began to spread as early as last year. For the past three years, Mexico has been plagued with a rapidly rising rate of inflation, which contributed to very high unemployment and a sharply increased outflow of capital as exports of Mexican goods and services grew less competitive in world markets.

Whereas consumer prices had been increasing about 5 to 6 percent a year prior to 1973, they rose over 11 percent that year and over 22 percent in 1974. Economic policies implemented in the latter part of 1974 lowered the rate of inflation a bit last year, but prices continued to climb at an annual rate of about 15 percent in the first half of 1976.

The acceleration of inflation made Mexican goods and services less competitive in the export market, and gains in employment and economic growth tended to be stymied. Growth of real output declined from 7.6 percent in 1973 to only 4.0 percent in 1975.

Except for Venezuela, with petroleum its primary export, all major Latin American countries recorded a deficit in their payments balance on goods and services in 1975. But Mexico experienced the second largest deficit of any of these coun-

INDUSTRIAL PRODUCTION
(SEASONALLY ADJUSTED)

— TOTAL PRODUCTION —	— MANUFACTURING —	— MINING —

140 (1967=100)

TEXAS
U.S.
LOUISIANA

130 — 131.4 / 130.1
120 —
110 — 112.3
100 — 1974 | 1975 | 1976

140 (1967=100)

TEXAS
U.S.
LOUISIANA

130 — 134.9 / 133.6 / 131.5
120 —
110 — 1974 | 1975 | 1976

120 (1967=100)

TEXAS
U.S.°
LOUISIANA

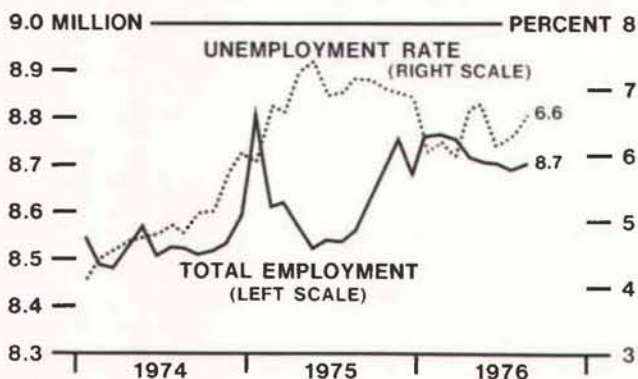110 — 116.8 / 113.2
100 —
90 — 90.7
80 — 1974 | 1975 | 1976

SOURCES: Board of Governors, Federal Reserve System
Federal Reserve Bank of Dallas

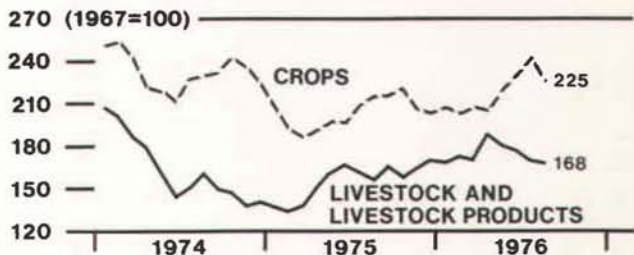°Comparable back data from the 1976
revision are not yet available.

EMPLOYMENT AND UNEMPLOYMENT
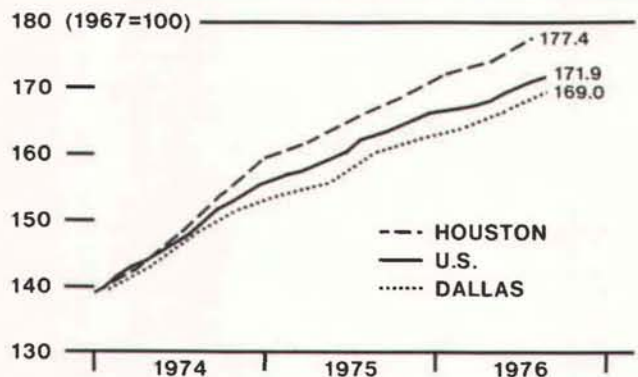FIVE SOUTHWESTERN STATES[1]
(SEASONALLY ADJUSTED, BY FRB)

9.0 MILLION ———————— PERCENT 8

UNEMPLOYMENT RATE
(RIGHT SCALE)

8.9 —
8.8 — — 7
8.7 — 6.6
8.6 — — 6 / 8.7
8.5 — — 5
8.4 — TOTAL EMPLOYMENT (LEFT SCALE) — 4
8.3 — 1974 | 1975 | 1976 — 3

1. Arizona, Louisiana, New Mexico, Oklahoma, and Texas
SOURCE: State employment agencies

CONSUMER PRICES

180 (1967=100)

177.4
170 — 171.9 / 169.0
160 —
150 —
140 —

--·- HOUSTON
——— U.S.
········ DALLAS

130 — 1974 | 1975 | 1976

SOURCE: U.S. Bureau of Labor Statistics

PRICES RECEIVED BY TEXAS FARMERS

270 (1967=100)

240 —
210 — CROPS — 225
180 —
150 — LIVESTOCK AND LIVESTOCK PRODUCTS — 168
120 — 1974 | 1975 | 1976

SOURCE: U.S. Department of Agriculture

SAVINGS AND LOAN ASSOCIATION ACTIVITY AND HOME BUILDING IN TEXAS
(SEASONALLY ADJUSTED, BY FRB)

900 MILLION DOLLARS ———————— PERCENT 100

WITHDRAWALS-TO-
SAVINGS RATIO
(RIGHT SCALE)

800 — — 90
700 — — 80
600 — — 70
500 — 543 / 61 — 60
400 — SAVINGS (LEFT SCALE) — 50
300 — 1974 | 1975 | 1976 — 40
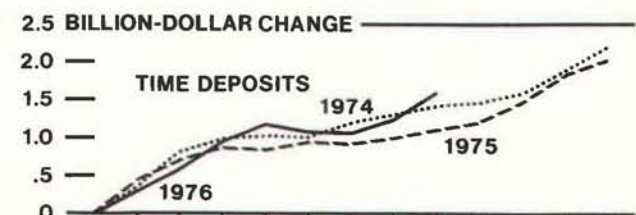
10.0 THOUSAND

8.0 — HOUSING STARTS 7.8
6.0 —
4.0 —
2.0 —
0 — 1974 | 1975 | 1976
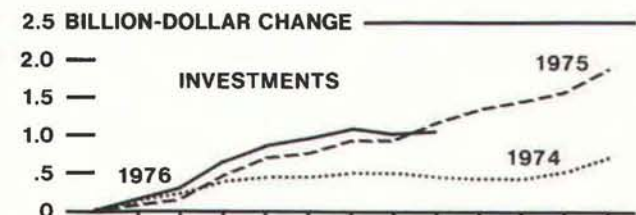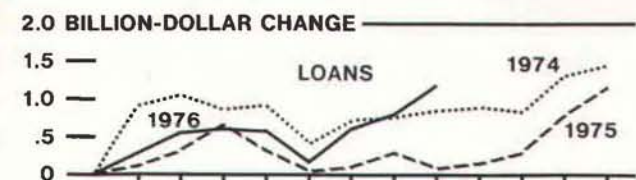
SOURCES: Bureau of Business Research, University of Texas
Federal Home Loan Bank of Little Rock

CONDITION STATISTICS OF ALL MEMBER BANKS
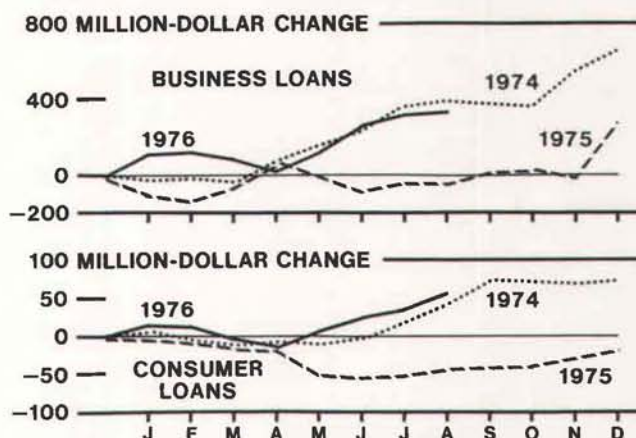ELEVENTH FEDERAL RESERVE DISTRICT
(CUMULATIVE CHANGES)

2.0 BILLION-DOLLAR CHANGE

LOANS
1974
1976
1975

1.5 —
1.0 —
.5 —
0

2.5 BILLION-DOLLAR CHANGE

INVESTMENTS
1975
1976
1974

2.0 —
1.5 —
1.0 —
.5 —
0

2.5 BILLION-DOLLAR CHANGE

TIME DEPOSITS
1974
1975
1976

2.0 —
1.5 —
1.0 —
.5 —
0

2.0 BILLION-DOLLAR CHANGE

DEMAND DEPOSITS
1975
1976
1974

1.5 —
1.0 —
.5 —
0
-.5 —
-1.0 —

J F M A M J J A S O N D
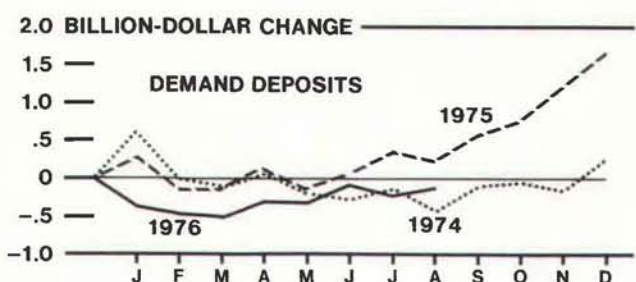
RESERVE POSITION OF MEMBER BANKS
ELEVENTH FEDERAL RESERVE DISTRICT
(MONTHLY AVERAGES OF WEEKLY DATA)

250 MILLION DOLLARS

200 — BORROWINGS
FROM FRB
150 —
100 —
50 —
0
-50 —
-100 —
-150 —

EXCESS RESERVES

1974   1975   1976
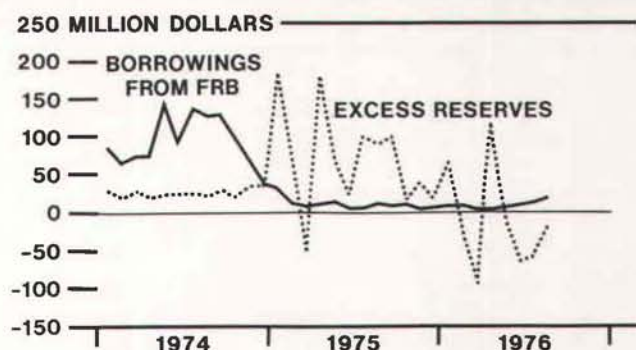
LOANS AT WEEKLY REPORTING BANKS
ELEVENTH FEDERAL RESERVE DISTRICT
(CUMULATIVE CHANGES)

800 MILLION-DOLLAR CHANGE

BUSINESS LOANS
1974
1976
1975

400 —
0
-200 —

100 MILLION-DOLLAR CHANGE

1976
1974
50 —
0
-50 —
CONSUMER
LOANS
1975
-100 —

J F M A M J J A S O N D

BUILDING CONTRACTS
FIVE SOUTHWESTERN STATES[1]
(SEASONALLY ADJUSTED, BY FRB)

1.6 BILLION DOLLARS

1.2 —

TOTAL
.8 —   .71
NONRESIDENTIAL
.4 —   .42
RESIDENTIAL
0

1974   1975   1976

1. Arizona, Louisiana, New Mexico, Oklahoma, and Texas
SOURCE: F. W. Dodge, McGraw-Hill, Inc.
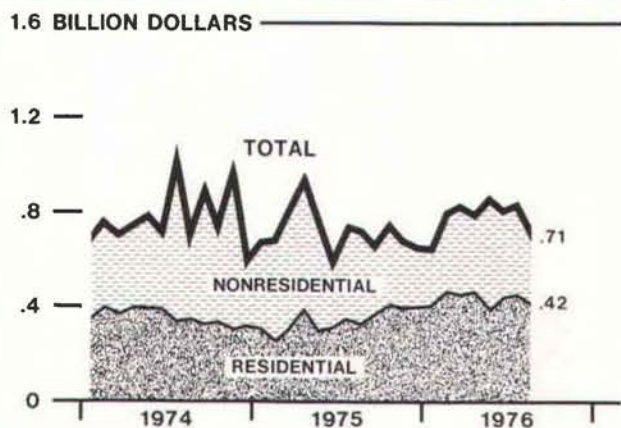
FOREIGN TRADE
HOUSTON CUSTOMS REGION
(SEASONALLY ADJUSTED, BY FRB)

1.4 BILLION DOLLARS

1.2 —   EXPORTS   1.26
1.0 —   1.08
.8 —
IMPORTS
.6 —
.4 —
.2 —

1974   1975   1976

SOURCE: U.S. Department of Commerce

tries—outranked only by Brazil. Brazil's deficit in 1975, however, represented a 6-percent improvement over 1974, while Mexico's deficit reflected an additional 40-percent decline in its balance of payments on goods and services.

Although the devaluation makes Mexican products more competitive in export markets, it also raises the cost of living in Mexico because of the boost it gives to the price of imports. Ensuing wage demands to compensate for the increased cost of living appear to be undoing, to some extent, the effect of the devaluation on Mexico's competitive position by raising unit labor costs.

The Mexican Labor Congress, the country's largest labor organization, immediately began pressing for a 65-percent increase in wages to offset the inflation that followed devaluation. The government countered with a recommendation of wage adjustments for most workers that ranged from 16 to 23 percent, and both labor and management agreed to accept that proposal, retroactive to Setpember 1.

To combat recent price increases, the government has initiated a price control program. A 10-percent price increase was allowed for a broad spectrum of goods and services, but other prices were frozen for six months. While the price control program may help discourage future wage hikes, it is also likely to give rise to black markets and limit the expansion of productive capacity.

OTHER HIGHLIGHTS:
• Preliminary data show the Texas industrial production index, seasonally adjusted, edged up in August. The improvement was marked by the third consecutive monthly rise in mining output, largely attributable to increased drilling activity and crude oil production.

Manufacturing output sagged as production of a broad range of goods fell. Weakness in durable goods production was due mostly to declines in transportation equipment, electrical machinery, lumber and wood, and stone, clay, and glass. However, gains in output were evident in furniture and fixtures, fabricated metals, and primary metals. The recent reactivation of idle capacity at two of its major plants boosted the aluminum industry's capacity utilization and production.

Production of nondurable goods suffered a small setback. Output of food and kindred products, textiles, and paper industries exhibited strength, but output of the chemical, apparel, printing and publishing, and petroleum refining industries softened.
• The unemployment rate for the five southwestern states rose to 6.6 percent of the total civilian labor force in August from 6.3 percent in the previous month. The increase was the second in a row and placed the jobless rate at its second highest level this year.

Total nonagricultural employment advanced for the second month in a row. The biggest gains were in mining and finance employment. Construction employment also rose significantly in August, reversing a three-month decline. Employment fell, however, in non-durable goods manufacturing and in transportation and public utilities.
• Total bank credit at weekly reporting banks in the Eleventh District rose moderately in August. Total loans increased slightly less than in the previous month, largely because of slower rates of growth in business loans and real estate loans. Consumers stepped up their borrowing slightly. With weaker loan demand and a moderate net inflow of deposits in August, these banks made the largest net addition to their holdings of U.S. Government securities since March.
• The value of total building contracts in the five southwestern states declined in August. Seasonally adjusted contracts for nonresidential construction tumbled 26 percent and residential construction contracts slipped 6 percent from the July levels. Residential construction was strong in Texas, however, as housing starts in the state in August rose to the second highest level this year.
• The ratio of withdrawals to new savings at Texas savings and loan associations plunged in July. A large drop in withdrawals was accompanied by a small decline in savings, leading to a significant growth of net inflows.
• The Dallas consumer price index for August was 1.7 percent higher than the May level. The largest price increases were in medical care, private transportation, and homeownership. Decreases were reported for such food items as cereals, bakery products, fruits, and vegetables. Prices of men's and boys' apparel were also down.
• Cash receipts from farm and ranch marketings in the states of the Eleventh District advanced 11 percent in the first seven months of this year over the same period last year. Receipts from livestock marketings increased nearly a fourth, but crop receipts declined slightly.

Total farm and ranch receipts for the nation as a whole increased 11 percent as livestock sales rose 17 percent and crop sales edged 4 percent higher. Even though cattle prices have been depressed, increased marketings of cattle expanded livestock receipts. Meanwhile, crop receipts have been affected somewhat by lower grain prices and sluggish marketings.