THE FAILURE OF THE MORTGAGE-BACKED FUTURES CONTRACT

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INTRODUCTION

On June 16, 1989, the mortgage-backed futures (MBF) contract opened for trading on the Chicago Board of Trade (CBOT). The new contract was completely redesigned from the failed GNMA Collateralized Depository Receipt (CDR) futures contract to address the shortcomings of the latter. To provide support for the contract, the CBOT also launched options trading on the futures—which marked the first time that futures and options were introduced simultaneously, and also the first time that the Commodity Futures Trading Commission had approved an option before its corresponding futures contract had begun trading.

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The futures and options were designed primarily for the mortgage lending industry. A loan originator could use the contracts as an alternative to forward sale of GNMA securities, or to hedge fallout or greater than expected closing of commitments in its pipeline. After an initial burst of activity in which trading volume exceeded 1000 contracts per day several times, trading of the futures contract steadily declined. Figure 1 plots the average daily trading volume across all coupons and contracts by month from June, 1989 through February, 1992; daily trading volume averaged only 9 contracts during December, 1991 and the last traded contract matured on March 13, 1992.

Although about three fourths of all new futures contracts fail, the MBF contract was thought to have a better chance of succeeding. The new contract eliminated the flaws of the GNMA CDR contract and was supported by an options market. The failure of the MBF contract permits a case-study analysis of the reasons for contract success or failure.

Prior research on the success or failure of a futures contract has identified several critical factors. Silber (1981) observed that successful contracts should meet legitimate hedging needs as well as be able to attract speculative capital. Market features that contribute to a successful environment include cash price volatility, liquidity, and the standardization of the commodity traded. As indicated by Silber, hedgers need a contract that reduces price risk while speculators are attracted by

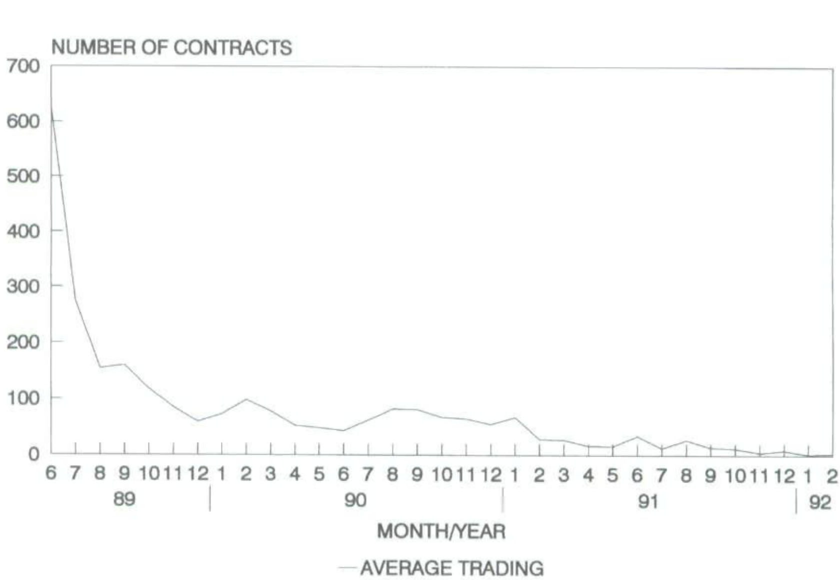

FIGURE 1
Average Daily Trading Volume.

the availability of profit opportunities (based on the speculator's forecast of price movements, i.e., spread trading between MBF and Treasury note futures). Cornell (1981) analyzed the failure of the commercial paper contract and concluded that lack of price variability was the key reason for its failure. Carlton (1984) compared the value of a futures contract relative to a forward contract and observed that futures contracts generally are far more liquid because they are standardized and trade on federally regulated exchanges. They also have lower transactions costs, and have no default risk.

Black's (1986) research was the first to statistically test the determinants of contract success or failure. Black's model emphasized four elements: (1) hedging effectiveness, as measured by the relative residual risk of own hedging versus cross hedging; (2) liquidity, proxied by the bid–ask price spread or average daily trading volume; (3) cash price volatility (which correlates with both the need for hedging and profit opportunities for speculators); and (4) cash market size. A small cash market may not generate sufficient hedging or speculative interest.

Johnston and McConnell (1989) conducted a detailed analysis of the GNMA CDR futures contract. Begun in 1975, the contract was the first interest-rate futures contract and enjoyed good success with annual trading volume in excess of 2 million contracts during 1980–1982. However, trading volume quickly fell after 1982 and trading ceased in 1987. Johnston and McConnell concluded that a design flaw in the contract produced a bias toward delivery of high coupon securities. They reported that by the mid-1980's the Treasury bond futures contract was a better hedging instrument for GNMA securities than the own hedge. The CBOT recognized and corrected these flaws in the new MBF contract.

This article follows Black's (1986) paradigm for determining contract viability and examines the MBF contract with regard to cross versus own hedging effectiveness, liquidity, cash market volatility, and cash market size. The next section describes the salient characteristics of the MBF contract and is followed by a section that presents the empirical methods and results of the study. Concluding remarks are contained in the final section.

THE MBF CONTRACT

An overview of the CBOT's MBF contract was provided in its marketing materials (1989) and in Thompson (1989/1990). Salient features are shown in Table I. Like its predecessor, this contract was based on GNMA securities. However, there were two important enhancements. One was that all contracts were settled in cash, avoiding the complications of delivering certificates. On the last day of trading (the Friday before the third Wednesday of the month), the CBOT would request bid quotes from 15 dealers randomly selected from a larger list of major firms. The median price for the coupon on the maturing contract—termed the survey price—was used to determine final gains and losses.

The second enhancement was that the trading unit was the current coupon GNMA as opposed to 8% coupons on the defunct GNMA CDR contract. The relative stability of mortgage rates between 1989 and early 1991 resulted in only 9.5% and 9.0% contracts being traded. Declining rates after that time reduced the current coupon, and the 9.5% did not trade after March, 1991. While the contract was listed, a total of four separate coupons traded. The coupons and their first trade dates were the following: 9.5% (June 16, 1989), 9.0% (July 14, 1989), 8.5% (March 15, 1991), and 8.0% (September 13, 1991).

TABLE I
CBOT Mortgage-Backed Futures Salient Features

Trading unit	$100,000 par value.
Coupons traded	Each month, the CBOT listed a new coupon four months in the future. The coupon for that month was the GNMA coupon trading nearest to par (100) but not greater than par.
Price quotations	In points and thirty-seconds of a point, e.g., 98-12 equals 98 and 12/32nds.
Trading months	Four consecutive months.
Daily trading limits	3 points (or $3000 per contract) above or below the previous day's settlement price (expandable to 4 1/2 points).
Last trading day	At 1:00 PM on the Friday preceding the third Wednesday of the month.
Settlement	In cash on the last trading day based on the mortgage-backed Survey Price. The Survey Price was the median price obtained from a survey of dealers.
Trading hours	7:20 AM to 2:00 PM (Chicago time).

Source: Chicago Board of Trade (1989).

EMPIRICAL ANALYSIS OF THE MBF CONTRACT

Methodology

Hedging effectiveness and liquidity are two of the major factors affecting viability of a futures contract. The following presents a methodology for testing hedging effectiveness and estimating realized bid–ask spreads.

Testing Hedging Effectiveness

Ederington (1979) and Figlewski (1985) demonstrate that a measure of the residual risk that remains in a portfolio after hedging is $1 - R^2$, where R^2 is from a regression of spot asset returns (R_S) on futures contract returns (R_F):

$$R_S = \beta_o + \beta_1 R_F + e \tag{1}$$

Black (1986) estimated an equation of this form to measure the hedging effectiveness of an own hedge versus a cross hedge (that is, a hedge with a futures contract of a related but different commodity). While larger values of R^2 imply a greater degree of effectiveness, this is not a statistical test of relative hedging effectiveness.

This article suggests a statistical test to satisfy this purpose. Let $\hat{e}_{M,t}$ be the residual from eq. (1) using the MBF contract as the hedging instrument and $\hat{e}_{T,t}$ the like using one of the Treasury contracts as a hedge. The standard F test is an invalid test on the null hypothesis that the two residual variances are equal [i.e., $\mathrm{var}(\hat{e}_{M,t}) = \mathrm{var}(\hat{e}_{T,t})$] in this situation because the residuals, $\hat{e}_{M,t}$ and $\hat{e}_{T,t}$ are not independent.[1] To overcome this problem, one may try an indirect test on the equality of variances when two variances are correlated, based on an idea that originates from Pittman correlation.[2] The suggested test is a two-step procedure. First, construct two transformation variables:

$$\begin{aligned} z_{1,t} &= \hat{e}_{M,t} + \hat{e}_{T,t} \\ z_{2,t} &= \hat{e}_{M,t} - \hat{e}_{T,t} \end{aligned} \tag{2}$$

[1]The standard F test is defined as a ratio of two independent chi-squared random variables. For an application in a similar case, see Saunders and Sienkiewicz (1987). However, $\hat{e}_{M,t}$ and $\hat{e}_{T,t}$ are not independent because they are from regressions with the same dependent variable.

[2]This transformation was suggested by Pittman. Further discussion of Pittman's correlation and comparison of correlated variances can be found in Snedecor and Cochran (1980), pp. 190–191.

The basic idea of this transformation is to establish the relationship that $\text{cov}(z_{1,t}, z_{2,t}) = \text{var}(\hat{e}_{M,t}) - \text{var}(\hat{e}_{T,t})$. Hence, the test of $\text{cov}(z_{1,t}, z_{2,t})$ equal to zero is equivalent to the test of the equality on $\text{var}(\hat{e}_{M,t}) = \text{var}(\hat{e}_{T,t})$.

Second, regress $z_{1,t}$ on $z_{2,t}$ using ordinary least-squares:

$$z_{1,t} = \beta_o + \beta_1 z_{2,t} + u_t \tag{3}$$

In eq. (3), if $\beta_1 = \text{cov}(z_{1,t}, z_{2,t})/\text{var}(z_{1,t}) = 0$, then this implies $\text{cov}(z_{1,t}, z_{2,t}) = 0$ and $\text{var}(\hat{e}_{M,t}) = \text{var}(\hat{e}_{T,t})$.[3] This rationale leads to a test of the significance of β_1 by the t-test.[4] If β_1 is not significantly different from zero, then the two futures contracts are equal in hedging effectiveness [i.e., $\text{var}(\hat{e}_{M,t}) = \text{var}(\hat{e}_{T,t})$]; if β_1 is greater than zero, then one of the two Treasury contracts is better; and, if β_1 is statistically less than zero, then the MBF contract is a better hedge [i.e., $\text{var}(\hat{e}_{M,t})$ is less than $\text{var}(\hat{e}_{T,t})$].

Estimation of Realized Bid–Ask Spreads

Because there are no quoted bid–ask spreads in futures markets, this article estimates realized bid–ask spreads for MBF contracts from intraday time and sales data obtained from the CBOT. Three alternative bid–ask spread estimators are calculated: (1) mean of absolute value of price changes [see Thompson and Waller (1987)]; (2) price-reversal [see Niederhoffer and Osborne (1966) and Bhattacharya (1983)]; and (3) the modified Roll estimator for time and sales data [Roll (1984)]. The procedures used recognize the fact that time and sales data do not contain transactions completed at repeat prices. That is, a price is recorded only when it differs from the last recorded price.

More specifically, the details of the calculations are as follows. The first method requires computing the intraday sequence of price changes, taking absolute values, and then computing the mean. Defining $\Delta P_t = P_t - P_{t-1}$, where P_t is the tth transaction price recorded within

[3]The $\text{var}(z_1)$ and $\text{var}(z_2)$ are always positive and greater than zero when the log of price changes of the MBF is not perfectly correlated with one of the Treasury futures. Ashley, Granger, and Schmalensee (1980) applied a similar procedure to test the equality of the mean square error of two competing forecasts in the out-of-sample period.

[4]The application of the t-test is justified by the assumption of the existence of the fourth moment of the error terms of the regression and large sample results. Ashley, Granger, and Schmalensee (1980, p. 1154) suggested using the t-test (on the significance of the regression coefficient, in this case) when the intercept is not statistically different from zero.

a day in the time and sales data, then the estimator equals

$$\frac{1}{T}\sum_{t=1}^{T}|\Delta P_t|$$

where P_o is the first recorded price of the day and there are $T + 1$ prices recorded.

The price-reversal procedure begins by computing the sequence of ΔP_t, as above, but then discards the subset of price changes that exhibit price continuity. That is, the procedure retains the calculations of those ΔP_t that are followed by a price change of the opposite sign (a negative followed by a positive, or the reverse). One then takes absolute values for the resulting subset of ΔP_t and computes their mean.

Roll's spread estimator can be modified for time and sales data by recognizing that a ΔP_t equal to zero will not be observed because only the time a new price is observed, the volume of contracts traded at that price, and the price itself are recorded. The modified Roll estimator equals

$$(-\mathrm{Cov}(\Delta P_t, \Delta P_{t-1}))^{\frac{1}{2}}$$

for $t = 2, \ldots, T$.

Each of these estimation procedures for realized bid–ask spreads has its own merits and limitations. The first method (mean of absolute value of price changes) is easy to compute but is contaminated by a change in equilibrium price due to information arrival. The second method (price reversals) mitigates the problem associated with serially correlated order arrival and information contamination but often results in the elimination of a substantial amount of data. The advantage of the modified Roll estimator is that it produces a direct estimate of the realized spread from observed transaction price data, assuming that the conditions underlying the model hold true. The disadvantage is that, in application, a positive first-order covariance of transaction price changes may be found. In such cases, there is no meaningful interpretation of the estimated spread from the resulting imaginary number. Further discussion of the experiences using these alternative estimators can be found in Thompson and Waller (1987), Wang et al. (1990), and Ma et al. (1992).

Empirical Results

Following Black's (1986) model, five factors are examined that affected the viability of the MBF contract.

Hedging Effectiveness of the Contract

Johnston and McConnell (1989) compared the effectiveness of the GNMA CDR, Treasury bond, and Treasury bill futures contract for hedging cash GNMAs. Ling (1993) presented a similar analysis for the 9.5% MBF contract. This study compares the own hedging effectiveness of the current coupon MBF contract with the cross hedging effectiveness of the Treasury bond and Treasury note futures. Cash prices for the 9.5% and 9.0% GNMA securities, and prices for the first nearby futures contract on Treasury bonds (15-year) and Treasury notes (6.5–10 years) are from Data Resources, Inc. and are as of the close of the futures market. Prices on the current coupon MBF contract are for the first nearby contract and are from the CBOT and reflect the last trade of the day. Because trading volume in later months had become sparse, sometimes the last (and only) MBF trade occurred during the morning. Thus, the trade times may not be synchronous with the GNMA spot and Treasury future prices, especially after 1990.

Table II presents the R^2 from a series of own hedge and cross hedge regressions. The analysis assumes a one-week hedging period and uses Friday-to-Friday percent changes in the spot and future prices for the 9.5 and 9.0% GNMA regressions. The regressions are estimated for each calendar year and coupon as well as the full sample period and pooled across both coupons. The statistical test described in the methodology subsection above is used to test whether the MBF contract is a superior hedging vehicle. The right-most column in Table II shows the t-statistics for the null hypothesis that β_1 equals zero in a comparison of the MBF contract with the Treasury note contract. Results for the bond contract are similar. During 1989, the MBF performed slightly better than the Treasury note contract, but the hedging performance of the Treasury had deteriorated by 1990 (based on the magnitude of the t-statistics). This was likely related to the increasing volatility in interest rates after 1989, which increased the basis risk of hedging GNMA securities with Treasuries. By 1991 there appears to be little difference in hedging effectiveness, probably due to limited trading which makes it impossible to synchronize the GNMA spot and MBF prices in the regression data set.

As argued by Black, the existence of a good cross hedge makes it more difficult for a new contract to become successful. This appears to have been the case for hedging current coupon GNMAs when the MBF was initially introduced. Even though the MBF contract was a significantly better hedge by 1990, a lack of liquidity prevented hedging demand from picking up.

TABLE II

Hedging Effectiveness of the Mortgage-Backed, Treasury-Bond and Treasury-Note Futures Contracts

Spot Asset and Sample Period	*Mortgage-Backed Futures with Same Coupon*	*Treasury Bond Futures*	*Treasury Note Futures*	*Number of Observations*	*Effectiveness of Mortgage-Backed vs. Treasury Note*[a]
(a) 1989 trades					
9.5% GNMA	0.87	0.65	0.66	21	−2.84
(b) 1990 trades					
9.5% GNMA	0.99	0.77	0.77	34	−18.09
9.0% GNMA	0.99	0.77	0.76	16	−10.58
9.0% and 9.5% GNMA pooled	0.99	0.85	0.84	50	−20.70
(c) 1991 trades					
9.0% GNMA	0.51	0.68	0.70	11	1.23
(d) Pooled across time					
9.5% GNMA	0.97	0.78	0.79	55	−9.23
9.0% GNMA	0.96	0.90	0.91	27	−3.02
9.0% and 9.5% GNMA pooled	0.97	0.85	0.86	82	−8.60

[a]The test statistic follows a t distribution. Negative (positive) values indicate the mortgage-backed is a more (less) effective hedging instrument.

Note: Hedging period is Friday-to-Friday for the 9.5% and 9.0% GNMA.

Liquidity

Market breadth is important for a successful contact because both hedgers and speculators are concerned about the size of an order that can be completed without leading to large price concessions. Three common measures of liquidity are bid–ask price spreads, trading volume, and open interest. The following examines the liquidity of the MBF contract by each of these measures, beginning with price spreads.

Due to scant data, transaction prices are pooled across days within a calendar month to produce realized bid–ask estimates by month. Figure 2 presents the time series of realized spreads calculated using the mean of absolute value of price changes (plotted with squares) and using price reversals (plotted with diamonds). The top chart uses expiration month data (i.e., prices for contracts maturing that calendar month) and the bottom chart uses pre-expiration month data (e.g., prices observed during October for the contract maturing in November). Realized spreads show an upward trend and the estimates become volatile as the number of observed price changes declines. Spreads averaged about 1–1.5 ticks (32nd of a point) through February 1990, then doubled to about 2–3 ticks for the remainder of 1990 with even higher estimates in 1991.

The widening of the realized spread can be seen also by viewing the distribution of price reversals. Figure 3 shows that the distribution of price reversals was very tight when the contract was introduced but developed a wide tail as trading volume fell.

Table III provides further evidence of the increase in spreads during 1990 by comparing the 9.5% MBF contracts expiring in December, 1989 and December, 1990. It also shows the greater liquidity of the Treasury bond and note contracts.[5] Regardless of the estimator used, the realized bid–ask spreads for the MBF contracts had doubled. Furthermore, by 1990 the spreads on the Treasury contracts were clearly smaller. These empirical results are consistent with conversations with dealers who indicated that throughout the 1989 period the spread was 1 tick for Treasury bonds, notes, and the GNMA cash market.[6] Thus, about a year after introduction, the MBF contracts were 2–3 times more expensive to use for hedging than Treasury bond or note futures.

[5]Realized spreads based on price reversals were generally somewhat higher, consistent with the observations of Wang et al. (1990).

[6]The authors thank Terry Belton of the Discount Corporation of New York Futures and Freddie Mac's Security Sales and Trading Group for this information.

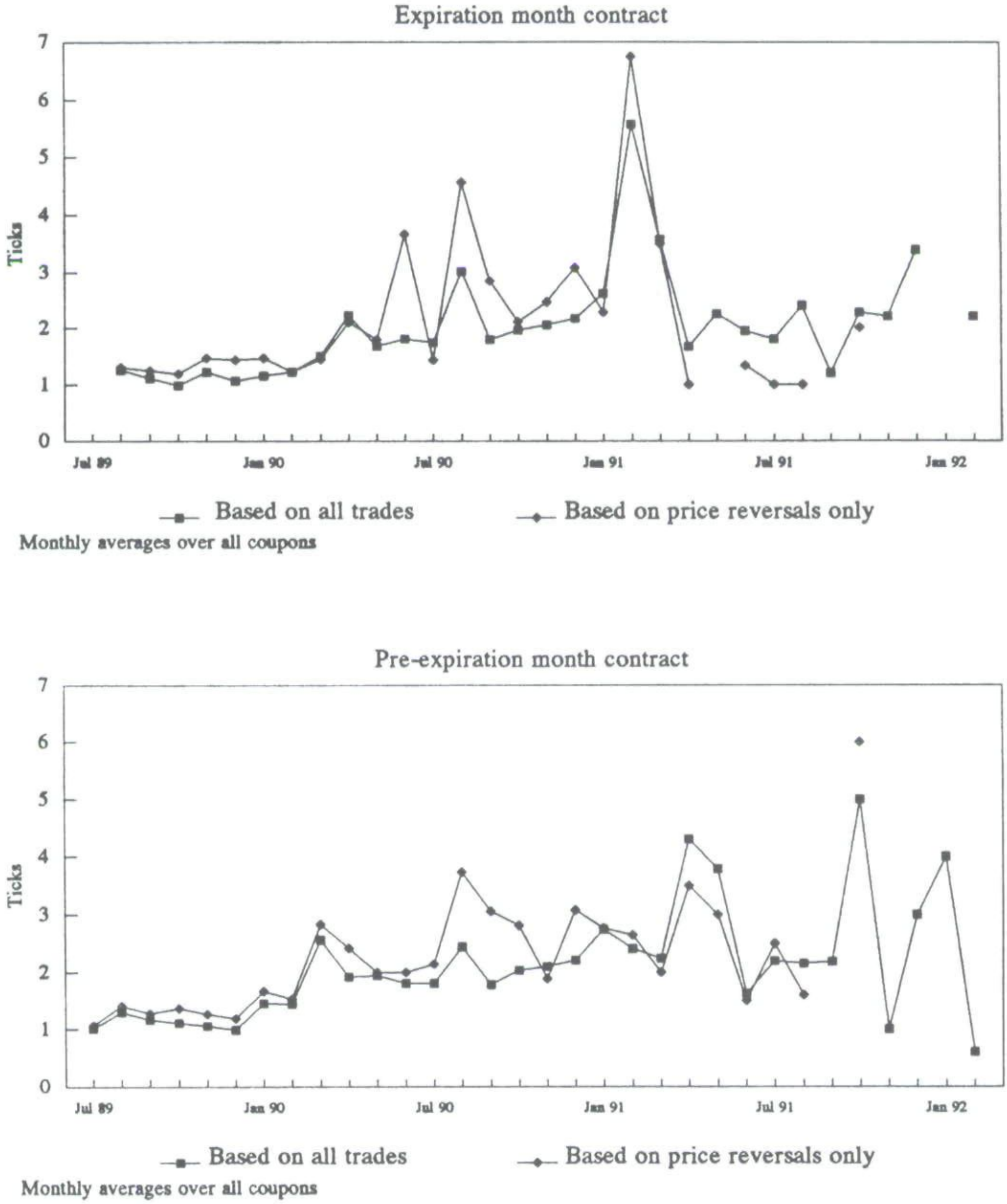

FIGURE 2
Estimates of realized spreads.

While Table III reports the modified Roll estimator, it is likely to be a poor measure of the spread for the MBF contract. The estimator generally cannot be computed for other MBF contracts covering other months because the first order autocovariances of the price changes were positive, which makes the estimate an imaginary number. This

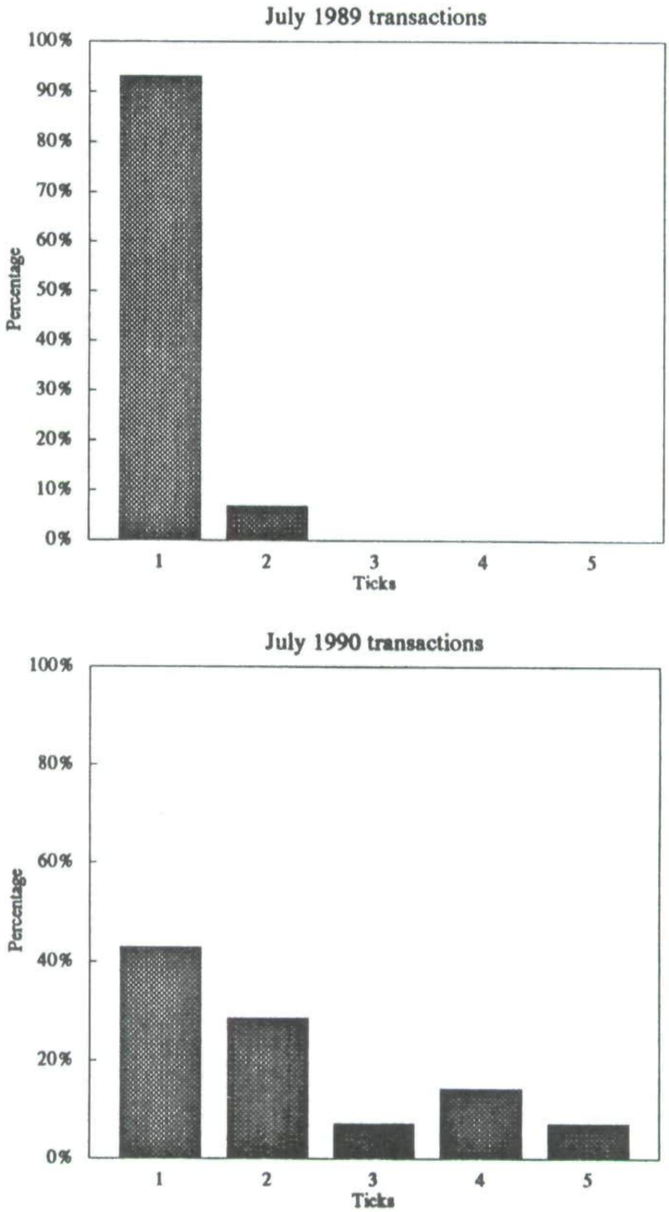

FIGURE 3
Distribution of price reversals, 9.5% August MBF contract. Distribution based on 247 reversals during July, 1989 and 14 reversals during July, 1990.

suggests that in a thin market, the assumptions made by Roll, such as random order arrival, may not be valid.

Figure 4 breaks out average trading volume by coupon and shows that volume fell with each subsequent new coupon. In comparison,

TABLE III
Alternative Estimates of Realized Spreads

	9.5% December MBF Contract	*Spread (in ticks)*	
Trade Days	*Price Changes*	*Price Reversals*	*Modified Roll Estimator*
December 1–15, 1989	1.06	1.50	0.57
December 3–14, 1990	2.17	3.08	0.92
	March Treasury Bond Futures Contract	*Spread (in ticks)*	
Trade Days	*Price Changes*	*Price Reversals*	*Modified Roll Estimator*
December 1–15, 1989	1.01	1.01	0.88
December 3–14, 1990	1.00	1.00	0.56
	March Treasury Note Futures Contract	*Spread (in ticks)*	
Trade Days	*Price Changes*	*Price Reversals*	*Modified Roll Estimator*
December 1–15, 1989	1.06	1.04	0.64
December 3–14, 1990	1.01	1.01	0.84

trading volume in Treasury bond futures was enormous, averaging 269,000 contracts per day from January through October, 1991.

Figure 5 plots the month-end open interest on all MBF contracts outstanding. The rule-of-thumb cited by Carlton (1984) is that daily open interest should exceed 5000 contracts for a contract to be successful. By this measure, the MBF contract never met a key feature to become successful.

In summary, all three measures of liquidity are consistent with each other. As expected, trading volume and open interest are inversely related with realized bid–ask spreads. These results also confirm a hypothesis suggested by Black (1986) and Black and Silber (1986) that the high liquidity of an existing contract may serve as an entry barrier for the success of a new contract, if the hedging effectiveness of the new contract is not substantially better than the cross hedging effectiveness of an existing contract.

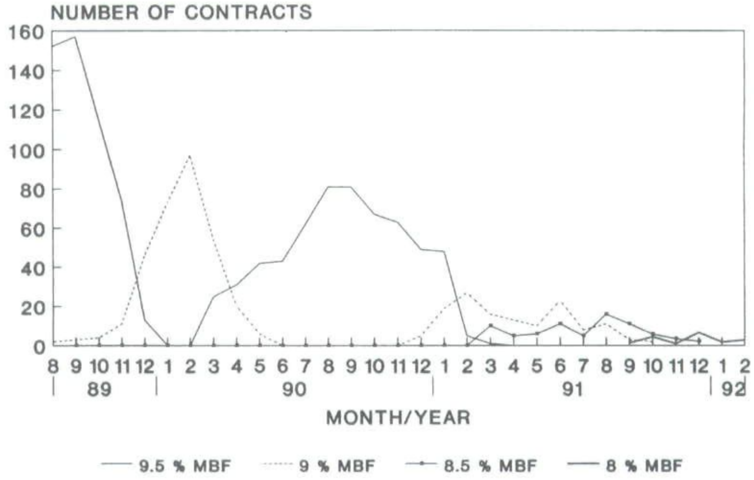

FIGURE 4
Average Daily Trading Volume.

Cash Price Volatility

Greater spot price volatility increases the demand for a futures contract for hedging purposes as well as providing profit opportunities for speculators. Table IV presents cash market volatility—calculated as the standard deviation of price changes during the calendar month—for the 9.5 and 9.0% GNMA securities and for the current coupon

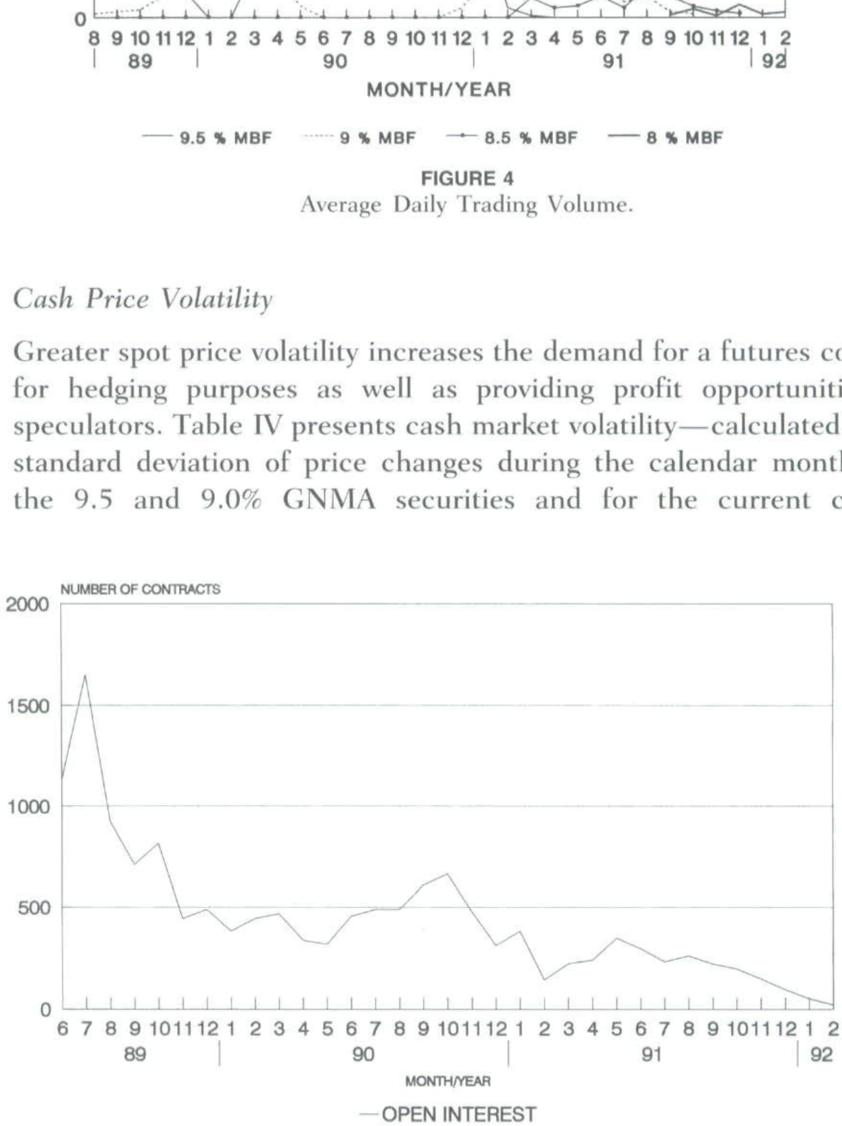

FIGURE 5
Month-End Open Interest.

TABLE IV
Cash Price Volatility

Month	*9.5% GNMA*	*9.0% GNMA*	*Current Coupon 10-Year Treasury*
July 1989	0.21	0.21	0.29
August	0.41	0.34	0.45
September	0.32	0.23	0.27
October	0.22	0.23	0.39
November	0.20	0.22	0.29
December	0.22	0.23	0.26
January 1990	0.24	0.29	0.35
February	0.41	0.44	0.54
March	0.25	0.28	0.35
April	0.23	0.23	0.26
May	0.35	0.41	0.45
June	0.30	0.31	0.33
July	0.21	0.26	0.29
August	0.44	0.50	0.55
September	0.23	0.25	0.28
October	0.31	0.34	0.40
November	0.25	0.28	0.32
December	0.29	0.31	0.39

Note: Volatility is calculated as the standard deviation of daily percent changes in price, multiplied by 100.

10-year Treasury. While GNMA volatilities are about 15–20% lower than for Treasuries, there is still substantial variation in cash prices within and across months, indicating that there is a need for having a hedging vehicle for these instruments. Furthermore, volatility appears to have increased over the observation period; thus, the fall off in MBF trading cannot be attributed to a decline in cash market volatility after July, 1989.

Nonetheless, the period during which the MBF contract was actively traded is often regarded as being far less volatile than the early 1980s, the period when the GNMA CDR contract had its heyday. If so, then the lessened degree of market volatility after June, 1989 would be a contributing factor to the failure of the MBF contract. In other words, the contract may have been introduced at a time when market forces were least favorable for its acceptance.

To compare market volatility with an earlier period, an ARCH model is estimated to determine the change in volatility of the 10-year constant-maturity Treasury yield from January, 1980 to December, 1992. The Treasury yields are monthly averages and are from the *Federal Reserve Bulletin*. A dummy variable (equal to zero from January, 1980 to June, 1989 and equal to one afterwards) is incorporated in the model to test the hypothesis of a shift to lower cash market volatility after June, 1989. The estimated model is:

$$\begin{aligned}
\Delta P_t &= \underset{(-0.10)}{-0.0024} + \underset{(5.17)}{0.328}\Delta P_{t-1} + \hat{e}_t \\
\hat{e}_t^2 &= \underset{(4.10)}{0.153} + \underset{(1.98)}{0.184}\hat{e}_{t-1}^2 + \underset{(0.32)}{0.023}\hat{e}_{t-2}^2 + \underset{(0.83)}{0.056}\hat{e}_{t-3}^2 - \underset{(-2.25)}{0.123}D_t \\
R^2 &= 0.39 \quad \rho(1) = -0.03, Q(24) = 34.5 \qquad (4)
\end{aligned}$$

where ΔP_t is the monthly change in yield, the number in parentheses under each coefficient is its associated t statistic, and $\rho(1)$ and $Q(24)$ are the first-order autocorrelation and the Box-Lujung statistics for residuals of eq. (4).

The coefficient of the dummy variable D_t is negative and statistically different from zero, evidence of lessened volatility after June, 1989. This empirical result is consistent with the view that the MBF contract was introduced at a time when market volatility was at a relatively disadvantageous level for the contract's acceptance.

Size of Cash Market

As Black noted, the larger the cash market, the larger the number of potential customers for a futures contract. In fact, cash market size was generally a significant regressor in her models. As with the volatility measure, here too the data suggest ample need for an active contract. As of March 1991, approximately \$70, \$75, and \$19 billion in 9.5, 9.0, and 8.5% GNMAs, respectively, were outstanding. These figures exclude securities pledged to multiclass mortgage securities.[7] Furthermore, new issuance of current coupon GNMAs totaled \$63 billion in 1991. Thus, based on both the stock of securities available for trading and the flow of new issuance, there would appear to be sufficient need for a futures contract.

Forward Market

While forward and futures contracts have similarities, there are important differences. First, the forward contract trades over the counter and

[7] These estimates are provided in Donaldson, Lufkin, and Jenrette: "Mortgage Market Analysis," March 18, 1991, p. 8.

is typically nonstandardized and less liquid, whereas futures exchanges are federally regulated and trade a homogeneous contract. Second, forward trades may fail in that the seller may be unable to transfer the commodity on time. As noted by Silber (1981, p. 145), "The successful innovation of a futures market to supplement or replace forward contracting stems from the reduced cost of contracting on futures exchanges." Such concerns are less relevant for GNMAs. By the late 1980s, the forward market was quite active and the Public Securities Association had stipulated tolerances for good delivery of GNMA securities, which helped bring some standardization to trading. Mortgage lenders who sell forward generally are fairly certain that a large proportion of commitments outstanding will close, thereby providing the product that is pooled for the GNMA security. Furthermore, bid–ask spreads were wider on the MBF than on forward GNMA contracts. Thus, an active and low-cost forward market, in addition to the availability of Treasury futures for hedging purposes, hurt acceptance of the MBF contract.

CONCLUDING REMARKS

This article conducts a case-study examination of the failure of the CBOT's mortgage-backed futures contract. Following Black's (1986) model, an analysis of the hedging effectiveness of the contract relative to alternative hedging instruments, contract liquidity, cash price volatility, and cash market size shows that the existence of good cross hedges and a lack of liquidity affected the viability of the contract. Furthermore, an active GNMA forward market with trading rules sanctioned by the Public Securities Association contributed to the lackluster interest of hedgers.

In particular, the Treasury bond and note futures contracts are found to be only slightly less effective hedging instruments for GNMA securities at the time the MBF contract was introduced, thereby hurting market acceptance. This was particularly true in the less volatile interest-rate environment of the late eighties. By 1990 the MBF contract was a superior hedge, but market liquidity had already become too limited. Estimates of realized bid–ask spreads confirm the decline in liquidity, as spreads were 2–3 times larger by mid-1990 compared to about a tick at contract inception. Thus, the contract was far more expensive to trade than Treasury bond or note futures.

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