Can the Pros Beat the Market?

Increasingly volatile financial markets put a premium on accurate forecasts of interest rates. However, those forecasts might have little value for individual investors if security prices already reflect such forecast information. In the extreme case, if the market efficiently utilizes all available information, an investor could not profit from more accurate forecasts than those already incorporated in security prices. On the other hand, if particular interest-rate forecasts are in fact superior, but are neither generally available nor believed by the market, an investor could increase the return on his portfolio by trading on such information.

This *Weekly Letter* examines whether an individual investor can profit from trading on the information contained in the interest-rate forecasts of market professionals. It does this by comparing the accuracy of their forecasts with the accuracy of the market's own forecasts, as implied by the term structure of yields. We utilize the data compiled by *The Goldsmith-Nagan Bond and Money Market Letter*, which has surveyed professional analysts' forecasts at quarterly intervals since September 1969. In our comparison, we focus on the forecasts of the 3-month Treasury-bill rate for 6 months in the future.

Measuring the market's forecast

Our measure of the market's forecast is derived from the term structure of Treasury-bill yields—specifically from the 6-month-ahead "forward rate." This is the interest rate on a 3-month Treasury bill 6 months ahead that would be required to equalize expected returns on 6- and 9-month bills over a 9-month holding period. The forward rate provides the appropriate measure, because investors can either buy a 6-month bill and reinvest the proceeds in a 3-month bill or hold a 9-month bill until maturity. Prices on 6- and 9-month bills thus should be bid up or down until the expected yields become equal over a 9-month holding period. Therefore, the for-

ward rate can be seen as measuring market participants' average forecast of the 3-month bill rate 6 months hence.

This forward rate also contains a premium to compensate investors in the 9-month bill for their sacrifice of liquidity. So to arrive at a measure of the market's expectation of the 3-month bill rate 6 months hence, we must subtract from the forward rate an estimate of this liquidity premium, which averaged about 50 basis points over 1970-79 but varied somewhat with the risk of interest-rate changes.

To maximize returns, investors should pursue a more sophisticated strategy than simply switching into long-term securities when they expect interest rates to fall, so as to "lock in" the yield, and doing the opposite when they expect interest rates to rise. They should realize that profits actually depend on whether interest rates change by more or less than the amount already anticipated by the market. Thus, investors trading on forecast information ought to lengthen the maturity of their security holdings only if this forecast shows interest rates below those forecasted by the market, and shorten them only when the opposite is true.

For example, suppose that near a business-cycle peak a particular interest-rate forecast indicates a larger decline in rates than what the market anticipates. An investor trading on that information thus should buy securities with maturities *longer* than his desired investment period. If this interest-rate forecast turns out to be correct, he would obtain higher yields than if he had chosen shorter maturities, because of the greater capital gains created by the unanticipated decline in interest rates. But in contrast, if the market's forecast turns out to be correct, the return from a longer maturity would be no higher than that on a security maturing over the investment period (except for a liquidity premium); and if

rates fall by less than either the market's or the investor's forecast anticipates, the return would be reduced by capital losses.

Alternatively, if the forecast utilized by the investor predicts slower declines in interest rates than the market's forecast, the investor should purchase securities with maturities *shorter* than his investment period. Then if the forecast is correct, he would obtain a higher return from "rolling over" a series of short-term securities than from purchasing maturities equal to his planned investment period. Once again, however, if the market's forecast turns out to be the correct one, nothing would be gained from this course of action; and if rates fall by more than the forecast of either the market or the investor, the return would be lower.

Professionals vs. the market
In our analysis, we compared the accuracy of the Goldsmith-Nagan panel's 6-month-ahead forecasts of the 3-month Treasury-bill rate with the market's forecast, as measured by the root-mean-squared error. (The sample period covered 1970-I through 1979-II.) We also considered the accuracy of a simple forecast of no change, where the interest rate is assumed to follow a "random walk." Such a forecast may be regarded as a minimum standard of accuracy for forecasting the 3-month bill rate. This contrasts with results from markets for longer-term securities, where a forecast of no change may actually be more accurate than any other forecast.

Short-period returns on longer-term securities are dominated by capital gains or losses resulting from changes in market prices. Any systematic pattern in such returns would be quickly eliminated as investors bid prices up or down in attempts to profit from them. In contrast, returns on 3-month Treasury bills held to maturity cannot be affected by such speculation, because the price at the end of three months is fixed contractually. Therefore, even a fully anticipated time pattern in 3-month Treasury bill yields is not likely to be arbitraged away. Moreover, interest-rate fore-

casts that use all available information should take into account any such systematic time pattern, as well as other relevant factors, and thus should be at least as accurate as a forecast of no change.

In our comparison, the root-mean-squared error (RMSE) of the market's forecast, at 1.24 percentage points, is slightly lower than that of a forecast of no change; but the RMSE of the analysts' forecast, at 1.10 percentage points, is even lower. So both the market and the analysts were able to improve upon the accuracy of a forecast assuming no change. Even more importantly, however, standard statistical tests reveal that the greater accuracy of the analysts' forecast, compared to the market's, could not have occurred by chance alone. (Also, the approach used to estimate the liquidity premium more likely caused an understatement, rather than an overstatement, of the true difference between the market's and the analysts' forecasting errors.) The 14-basis-point difference between the RMSEs is relatively modest. Nevertheless, our results indicate that investors could have improved profits significantly by trading on the information contained in the analysts' forecast. A strategy of shortening maturities when the analysts' forecast was above the market's forecast—and lengthening them when the opposite was true—would have improved overall returns.

Sources of information
Both forecasts contain two parts—an auto-regressive component that extrapolates from past changes in the bill rate, and a remaining component based on other information. *The analysts' forecast was superior to the market's forecast in both respects.* The autoregressive component of the market's forecast was not significantly different from a prediction of no change, or a random walk. Indeed, the market's forecast failed to incorporate an upward drift in the bill rate attributable to rising inflation in the forecast period, even though this drift could have been extrapolated from past data. In contrast, the autoregressive component of the analysts' forecast contained a pos-

itive time trend of 54 basis points per year, as well as significant correlations with past fluctuations in the bill rate. In addition, the remaining component of the analysts' forecast contributed significantly to forecasting accuracy, while the corresponding component of the market's forecast did not.

In summary, our evidence indicates that the market's forecast of the 3-month Treasury bill rate, as implied by a term structure of yields, was not significantly different from a prediction of no change—or a random walk. While we may expect a random walk in short-period yields of stocks or bonds, even a fully anticipated time pattern in the return on bills held to maturity is not likely to be arbitraged away. Forecasters of Treasury-bill rates thus should be able to improve the accuracy of their forecasts by taking into account any such existing time patterns. The Goldsmith-Nagan panel of forecasters in fact did so, and also used additional information unrelated to the bill rate's past history to improve the accuracy of their forecasts. Moreover, the information contained in this panel's forecasts was not fully reflected in the prices of Treasury bills, so that individual investors could have increased their profits by utilizing these or similar forecasts.

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Accuracy of Forecasts Root Mean Squared Error (RMSE) 1970-I through 1979-III (percentage points)	
Forecast of No Change	1.25
Market's Forecast	1.24
Analysts' Forecast	1.10

BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT
(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 8/12/81	Change from 8/5/81	Change from year ago	
			Dollar	Percent
Loans (gross, adjusted) and investments*	151,192	− 160	12,380	8.9
Loans (gross, adjusted) — total#	130,150	− 127	13,037	11.1
Commercial and industrial	39,577	− 96	5,917	17.6
Real estate	53,609	136	6,247	13.2
Loans to individuals	23,081	− 67	− 754	− 3.2
Securities loans	1,334	− 12	333	33.3
U.S. Treasury securities*	6,136	− 22	− 131	− 2.1
Other securities*	14,906	− 11	− 522	− 3.4
Demand deposits — total#	40,249	−1,794	− 3,881	− 8.8
Demand deposits — adjusted	28,780	64	− 3,309	−10.3
Savings deposits — total	29,939	− 348	491	1.7
Time deposits — total#	85,166	1,328	22,585	36.1
Individuals, part. & corp.	77,235	1,303	22,868	42.1
(Large negotiable CD's)	35,006	889	12,066	52.6

Weekly Averages of Daily Figures	Week ended 8/12/81	Week ended 8/5/81	Comparable year-ago period
Member Bank Reserve Position			
Excess Reserves (+)/Deficiency (−)	60	33	− 61
Borrowings	60	44	31
Net free reserves (+)/Net borrowed(−)	0	− 11	− 92

* Excludes trading account securities.
\# Includes items not shown separately.
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