

## **Analysis of *Investment Advisor* Strategists' Predictions**

**Brian Hornberg and Thomas M. Krueger**

### **Introduction**

The very process of investing implies forecasting the future. Security buyers expect investment yields to at least equal the required rate of return. Furthermore, those investing in the stock market are assuming that they can earn a higher rate of return than would have been received in the bond market. When buying stocks or bonds, investors are predicting that their rate of return will exceed the inflation rate. Future economic conditions will dictate whether the investor in stocks, bonds, or cash come out ahead. Consequently, investment success will hinge on how accurately economic conditions are forecast.

Forecast accuracy can be empirically tested. The difficult part of the analysis is identifying a sufficiently long series of forecasts from a single prognosticator so that it covers multiple market conditions. In this report, we will examine the forecasting ability of the financial gurus picked by *Investment Advisor*, the popular journal whose subtitle is "The Advisor to Advisors." In December 2005, *Investment Advisor* celebrated its 25<sup>th</sup> year of publication. During most of this time period, the serial has included a monthly column titled "Asset Allocation." Approximately ten varying experts in the brokerage, portfolio management, and banking industries have provided economic and financial market forecasts. In this study we will examine the accuracy of those forecasts.

This report is split into six sections. The next section provides a brief literature review of market modeling and forecasting. The third section discusses the economic and financial market forecasts provided by *Investment Advisor*. The fourth section covers the empirical model used to test forecast accuracy, while the fifth section includes the results of our study. Finally, a short summary is presented.

### **Literature Review**

Thousands of empirical economic exercises are run daily in an attempt to predict changes in economic variables. Diebold (1997) examines over one hundred articles on this subject. Obviously, this literature review cannot do justice to the multitude of research

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Brian Hornberg is Senior Research Engineer at Natural Process Design, in Winona, Minnesota and a MBA Program Alumnus of the University of Wisconsin-La Crosse. Thomas M. Krueger is Professor of Finance in the Department of Finance at the University of Wisconsin-La Crosse, La Crosse, Wisconsin.

contributions made over the years. For instance, much effort has been put forth in an attempt to identify underlying trends in economic indicators. Near the time that *Investment Advisor* first started publishing its forecasts, Kyland and Prescott (1990) described the correlation of real GNP with lags of itself. More recently, Croushore and Stark (2003) reported that GNP numbers are stable across time. Although there is only a limited amount of information about future inflation in maturities up to a year, Mishkin (1991) found that going beyond a year increases the prediction of yield curves in Germany and the United States. In the same nations, Estrella, Rodrigues, and Schich (2003) report that models predicting national productivity and recessions are more stable than those that predict inflation. However, Shields, Olekalns, Henry, and Brooks (2005) found that shocks to the economy can result in changes in inflation and industrial production that can last for up to three years and the impacts vary with positive and negative shocks to the economic landscape.

### The Livingston Survey

Perhaps the best comparison to the *Investment Advisor* forecasts is the Livingston Survey, which was started in 1946 by the late columnist Joseph A. Livingston, a business journalist for the *Philadelphia Inquirer*. It is the oldest continuous survey of economic expectations in the United States and summarizes the forecasts of fifty economists from industry, government, banking, and academia. The Federal Reserve Bank of Philadelphia took responsibility for the survey in 1990.

The Philadelphia Federal Reserve's release of the Livingston Survey includes the actual release, documentation, mean and median data of all of the respondents, as well as individual responses from each economist. Participants are asked to forecast a set of key macroeconomic variables, including real and nominal GDP, inflation based on both the producer price index and consumer price index, the unemployment rate, interest rates on three-month Treasury-bills and 30-year Treasury bonds, and the stock market including the Dow Jones Industrial Average and Standard & Poor's 500.

With such a treasure trove of economic forecast information, it is not surprising that a multitude of analysts have studied the accuracy of the Livingston Survey. Keen (1981) analyzed forecasts from 1971 – 1978 in an effort to tell which forecasters were best: those from academia, banking, or business? No consistent differences were found in the forecasts of nominal GNP, real GNP, consumer prices, and unemployment when considering size of error and turning points. Another relevant analysis conducted by Keen was whether the Livingston forecasters were better than the “no-change” model for 6 and 12-month-ahead forecasts. They were generally more accurate, with the exception of forecasts for the industrial stock price index.

Ahlers and Lakonishok (1983) examined the Livingston survey from the first survey up to 1978 and three sub-periods. Forecast accuracy was examined for ten macroeconomic variables and for two forecast horizons. Their findings included

- a. economists underestimate changes
- b. economics are too optimistic
- c. economists do better than a “no-change” model,
- d. economists do better than a simple trend extrapolation, and
- e. economists do not appear able to predict turning points.

One relevant conclusion of Ahlers and Lakonishok was that the economists' forecasts improved over time, but this conclusion was based on only three time periods, the last of which was almost thirty years ago. Additional information can be found in a report written in conjunction with the 50<sup>th</sup> anniversary of the Livingston survey, where Croushore (1997) provides a compendium of over twenty research articles examining the Livingston data.

### **Data**

#### *Investment Advisor*

Based in Shrewsbury, New Jersey, and owned by Wicks Business Information, *Investment Advisor* is the nation's leading source of news, information, research, and practical help for independent financial planners. Long the distinguished monthly magazine serving advisors and planners, the magazine is at the forefront of publications tracking what is going on in financial planning and investments. In an attempt to reach every qualified financial intermediary currently active, Wicks Business Information offers free subscriptions to *Investment Advisor* magazine and *Investment Advisor's* e-newsletter to qualified recipients, including finance professors, in the United States. Other parties pay an annual fee of \$89.00 in the United States and Canada, or \$109.00 elsewhere.

*Investment Advisor* attracts experienced and successful investment professionals from Main Street to Wall Street, constituting one of the largest and highest quality audited circulations of fee/commission financial professionals of any trade magazine. According to the Investment Advisor Group website ([www.investmentadvisor.com](http://www.investmentadvisor.com)), *Investment Advisor's* 77,000 readers manage or advise on some \$1 trillion in client assets. By comparison, the web site of *Financial Advisor*, a leading competitor, reports a 2006 circulation of 70,000. On average, its subscribers have been in the financial industry for more than 10 years, and have an average of 203 clients, each with an average account size of nearly \$775,000. Recent articles in *Investment Advisor* included information on such wealth-management areas as hedge funds, separately managed accounts, and tax advice for high-income clients.

Since March 1991, *Investment Advisor* has included recommended asset allocations of *Investment Advisor's* panel of distinguished economists and money managers. The February 2006 edition included nine experts, including Gary Schilling (A Gary Shilling & Co.), Gail Dudack (SunGuard Institutional Brokerage), Save Stoval (Standard & Poor's), and Richard Bernstein (Merrill Lynch). One expert provides a 100-word synopsis explaining their stocks/bonds/cash distribution. These experts also forecast the values of five economic and financial market indicators in six months. The February 2006 edition, for instance, forecasts economic conditions through August 2006.

### **Research Hypothesis**

*Investment Advisor* has an ongoing "Asset Allocation" column where strategists predict the level of the several macroeconomic measures of a financial nature six months later. Nine to thirteen experts have attempted to predict the level of the following stock market, bond market, economic growth, inflation, and short-term interest rate measures.

- Stock Market                      Dow Jones Industrial Average
- Bond Market                      Rate on 30-day Treasury Bonds or 10-year Treasury Notes
- Economic Growth                Annual Growth of Real GDP in GNP

- Inflation Annual Increase in the Consumer Price Index
- Short-term Rates Annualized yield on the Three-month Treasury Bills

The Asset Allocation column has been published by Investment Advisor for fifteen years, resulting in a mountain of information on which to base an analysis of strategist forecasting ability. In making statistical decisions, null and alternative hypotheses need to be created. The null hypothesis, which is assumed to be true, is that there is no bias in the forecasting of economic data. The alternative to this hypothesis is that there is a bias, and that the forecast is either too high or too low. (Spiegel et al, 2001)

Forecast accuracy, will be determined through the calculation of the average difference between the forecast and the actual figures. If analysts are able to accurately predict future economic conditions, the average difference between the forecast and the actual figure should be zero.

### **Data Collection**

All data was taken from the “Asset Allocation” section of the *Investment Advisor*. The strategists’ predictions were compared to actual values for the market indicators given in later issues of the *Investment Advisor*. Strategists’ predictions were assumed to indicate the level of the data at the end of the month indicated. For example, the December 2003 edition says that the predictions are “Through May 2004.” Therefore, the data to be used should reflect the activity at the end of the month of May. In this example, the data that was compared to the strategists’ predictions from the July 2004 edition. The levels indicated on the footnote to Current Level states that the values are as of 05/28/04, the end of May. The same procedure was used for the rest of the comparisons. However, sometimes the Current Level given was as of the beginning of the month. For example, the November 2004 levels were given as of 10/01/04, the beginning of October. This data was considered to be “Through September” and was compared against the April 2004 prediction.

Some problems arose, though, when the values from earlier years’ predictions were compared against the actual values. Many times the values for the CPI and GDP were given as quarterly values. In this case, the quarter that the month fell into was used. For example, the June 1992 predictions were through November 1992. November falls in the fourth quarter and the economic growth numbers for the fourth quarter appeared in the March 1993 edition.

### **Statistical Analysis**

All data was entered into Microsoft’s Excel spreadsheet. After the data was entered, the difference between the predicted value and the actual value was calculated, which is the error for the entry. A negative value means that the prediction underestimated the actual number, while a positive value means that the prediction was an overestimation. With these values known, the next step was to calculate the mean and the standard deviation of the errors for each of the financial statistics. These were done through functions built into Excel. Table 1 exhibits the average forecast error, standard deviation, and z-score for the five economic measures in the same order in which they are presented in *Investment Advisor*.

<b>Stock Market</b>		<b>Inflation</b>	
Average Forecast Error	-292	Average Forecast Error	-0.031
Standard Deviation	1013	Standard Deviation	0.804
z-score	-3.80	z-score	-0.50
<b>Bond Market</b>		<b>Short-Term Rates</b>	
Average Forecast Error	-0.027	Average Forecast Error	0.242
Standard Deviation	0.715	Standard Deviation	0.840
z-score	-0.48	z-score	3.76
<b>Economic Growth</b>		<b>Confidence Interval: Range:</b>	
Average Forecast Error	-0.545	68.3%	$\sigma$
Standard Deviation	1.912	95.4%	$2\sigma$
z-score	-3.72	99.7%	$3\sigma$

### Normal Distribution

A visual representation of the distribution of the errors can be constructed with the averages and the standard deviations known. A normal distribution, also known as a bell-shaped curve or Gaussian curve, is a convenient model as many distributions form a normal curve. (Normal Distribution, 2006) It is possible to construct the Gaussian Curve of the errors of the predictions with the probability distribution function. There was one curve created for each of the economic variables. The distributions of curves for the economic data are exhibited in Appendix A.

### Prediction Accuracy for Entire Sample Period

#### Stock Market (Dow Jones Industrial Average)

The prediction for the stock market seems to have a tendency to under predict the Dow Jones Industrial Average (DJIA), as the average prediction is nearly 300 points below the actual value, as shown in the first row of Table 1. Also, the curve is very flat; the standard deviation is very large as a confidence interval covering 95% confidence interval would cover 2,027 points on the DJIA on each side of the average. Much of this variation is caused from the under prediction of the DJIA in the late 1990s. A z-score test was used to see if the bias was statistically significant. On a two-sided test, an alpha value of 0.05 would give critical regions of above 1.96 and below -1.96. Since the z-score, -3.8, is less than -1.96 we can reject the null hypothesis and conclude that there is a bias in the strategies forecasting accuracy. There is a bias is towards underestimation of the value of the Dow Jones Industrial Average.

#### Bond Market (Long-term Interest Rates)

There is only a slight under prediction of long-term interest rates; an error of about 3 basis points. The standard deviation of long-term interest rates was a much higher 71 basis points. Consequently, a 95% confidence interval would have a range of 2.8 percentage points. The z-score is -0.48. Since the z-score is between -1.96 and 1.96 we do not reject the null hypothesis

of a bias in long-term interest rate forecasts. The strategists appear to be able to forecast this estimate of economic activity.

#### Economic Growth (GNP/GDP Growth)

Economic growth was the third macroeconomic measure where the average prediction was slightly negative. Although the economic growth forecast error was 55 basis points, the standard deviation was higher, at 190 basis points, creating a flatter normal curve. Economic growth's z-score was -3.72. Since the z-score is less than -1.96 we reject the null hypothesis of no forecasting bias. The strategists significantly underestimated economic growth.

#### Inflation (Consumer Price Index)

The inflation prediction was slightly less than the actual inflation rate, as measured by the change in the consumer price index, with a difference between actual and predicted of less than four basis points. Across, the 170 observations, inflation's standard deviation was about eighty basis points, resulting in a z-score of -0.503. Since the z-score is between -1.96 and 1.96, we can conclude that *Investment Advisors'* strategist did a very good job forecasting the change in the consumer price index.

#### Short-Term Rates (Three-month Treasury Bills)

The last macroeconomic variable predicted by *Investment Advisor's* strategists, the 3-month Treasury-bill's interest rate, is the only one that has an average error that is positive. Predicted Treasury-bill rates exceeded actual Treasury-bill rates by 24 basis points, as exhibited in Table 1. Meanwhile, the standard deviation of short-term rates around the mean was 84 basis points. As one might expect, the standard deviation of short-term rates is very close to that of inflation. The z-score was 3.76. Since the z-score is greater than 1.96 we reject the null hypothesis that there is no bias in the forecasting of short-term interest rates. Financial analysts consistently over estimated short-term rates

### **Prediction Accuracy Changes Across Time**

The sample period was also split in half to determine whether strategist forecasting ability has improved over time, perhaps as a consequence of improved technology. The first period runs from approximately 1991-1997, while the other runs from 1998 to 2005. Table 2 summarizes the results.

Macroeconomic Variable	<u>1991-1997</u>		<u>1998-2005</u>	
	Average Error	z-score	Average Error	z-score
Stock Market	-633	-9.63	32	0.25
Bond Market	0.025	0.30	-0.81	-1.10
Economic Growth	-0.386	-2.14	-0.698	-3.05
Inflation	0.307	5.67	-0.353	-3.63
Short-term Rates	0.145	1.91	0.336	3.29

Analysis of *Investment Advisor* strategist predictions across time leads to some interesting insights. For instance, although stock market forecasting was poor in the first half of the sample period, it improved remarkably in the 1998-2005 period. As shown in the first row of Table 2, the average forecast for the Standard & Poor's 500 rose from being 633 points below the future level, to being 32 points above it. With it, the z-score dropped from -9.63 to 0.25.

Long-term bond market yield predications were insignificant in both periods, as exhibited in the second row of Table 2, as suggested by the z-values being under 1.96 (-1.96). However, strategist slightly overestimated future long-term interest rates during the first half of the sample period, and then underestimated rates during the second half of the period. As a consequence, the average error, as on Table 1, was less than three basis points.

*Investment Advisor* strategists appear to consistently underestimate the economic growth, as shown in the third line of Table 2. Furthermore, there seems to be a bias that is significant in both periods. These findings are consistent with those for the entire period, as shown in Table 1.

Inflation forecasts experienced a dramatic shift over the past fifteen years. In the early period, there is a significant tendency to overestimate the changes in the consumer price index. During the latter period, there is a significant bias towards over estimating inflation. This tradeoff resulted in an apparent consistent lack of bias in the forecasting of inflation, which was reported in Table 1.

Short-term interest rate forecasts appear to have gotten worse over time. The z-score for the 1991-1997 is close to the 1.96 level necessary to indicate a bias in Treasury-bill rate prediction at the 0.05 level. The average z-score, as well as the error itself, is much greater in the latter period. The reason that this finding runs counter to that exhibited in Table 1 may be the smaller sample size on which the results in Table 2 are based.

### **Conclusion**

Correct financial decisions require accurate forecasts of future economic conditions. The literature review covered many instances where macroeconomic data was used to test models of economic activity, analyze economic events, and forecast conditions. Accurate predication of future economic conditions help investors, financial organizations, government bodies,

regulators, and business concerns effectively management their funds. Consequently, many economists and financial publications attempt to accurately predict the values of chosen macroeconomic metrics. In this study, we examined the ability of the strategist chosen by *Investment Advisor*, the leading trade magazine dedicated to financial planning, and quoted monthly in its "Asset Allocation" column. Data was obtained for the entire fifteen years that this information has been published.

Two of five economic forecasts statistically showed a great deal of accuracy over the 15-year span. The forecasts for the bond market and the inflation rate statistically have no bias over the years. However, when both early data and more recent data are looked at individually, the accuracy of *Investment Advisor* strategists' inflation rate forecast seems to be time sensitive. Segmenting of the data does not affect the bond market hypothesis results.

Less accuracy was observed for the prediction of the other three economic measures, the stock market, economic growth, and short-term rates. However, over shorter periods, some of the predictions appear to have less bias. For instance, when the stock market data is split, the hypothesis of prediction accuracy was rejected for the first half of the sample period but accepted for the second half. By contrast, short-term interest rate forecasts were statistically accurate during the first sub-period, but not the second sub-period. Predictions of changes in gross domestic product were not accurate whether one used the data from 1991-1997, from 1998-2005, or the entire period.

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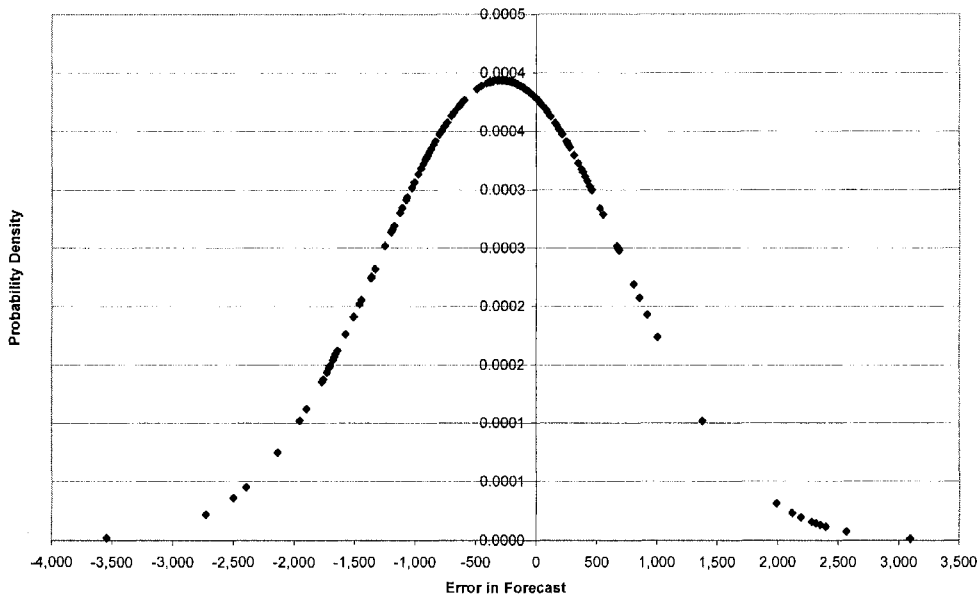
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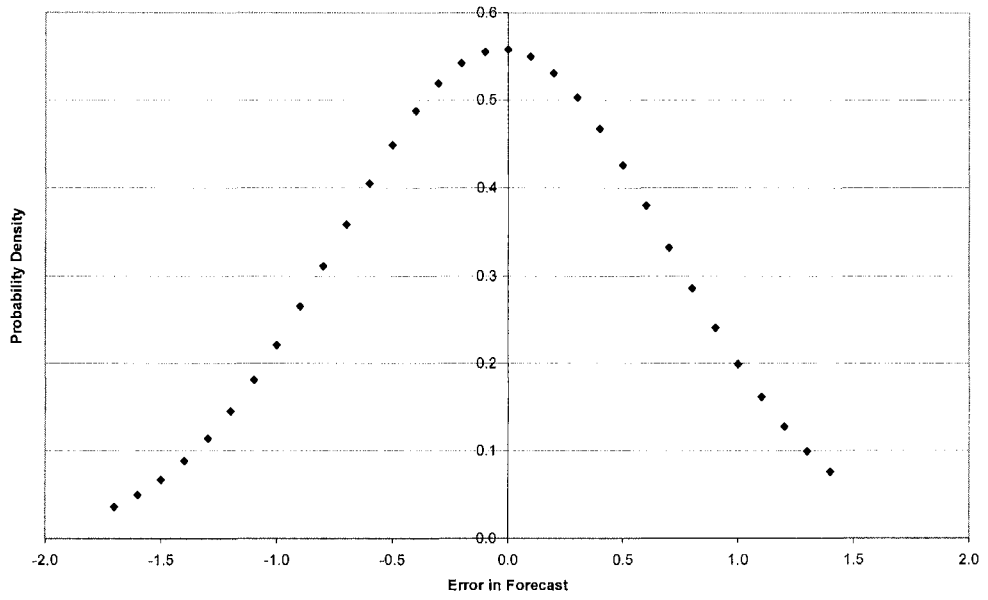
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## Appendix A:

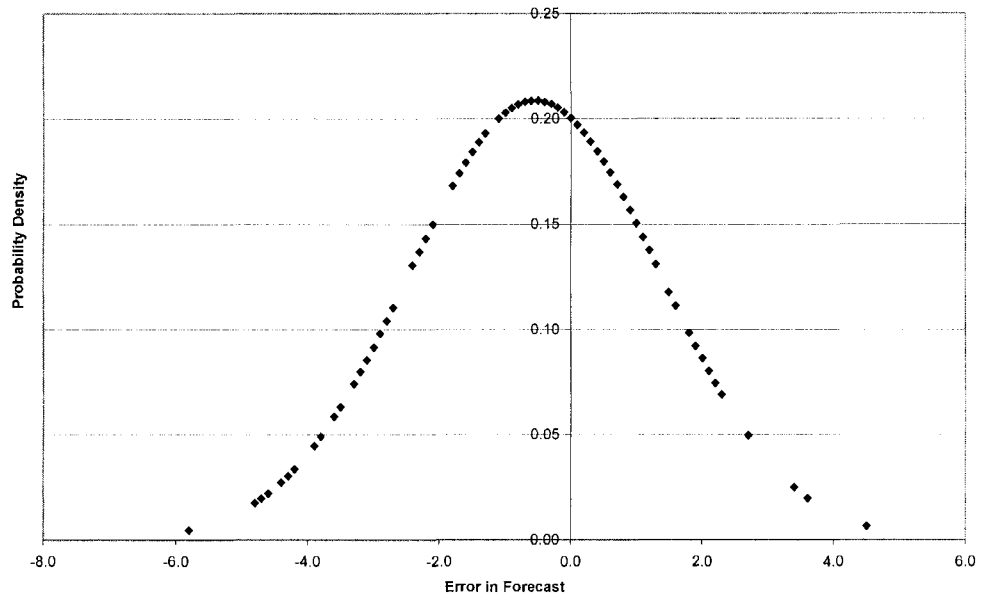
Gaussian Distribution of the Stock Market (DJIA)



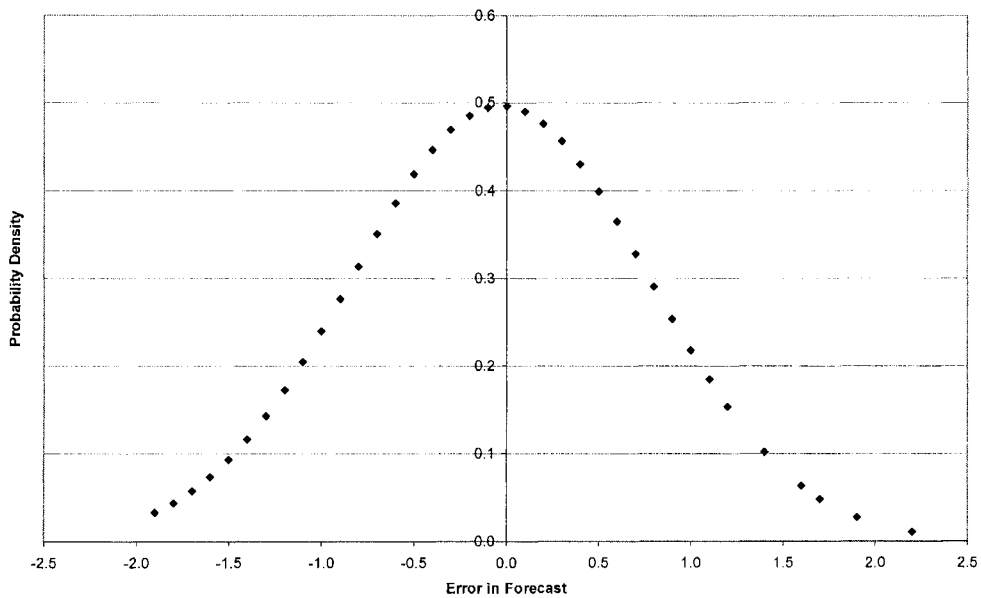
Gaussian Distribution Bond Market



Gaussian Distribution of Economic Growth (GNP/GDP)



Gaussian Distribution of Inflation (CPI)



Gaussian Distribution of Short-Term Interest Rates (3 mo.)

