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## Expectations and Stock Values

A recent study by NBER Research Associates **John G. Cragg** and **Burton G. Malkiel** has found that the earnings forecasts made by security analysts appear to play an important role in determining stock prices. In addition, the amount of dispersion in the forecasts by different analysts—which can be viewed as an indication of uncertainty of risk—apparently is a factor in the valuation of a company's stock and in the estimation of the relationship between risk and return. Cragg, chairman of the economics department at the University of British Columbia, and Malkiel, the economics chairman at Princeton, compare predictions made during the 1960s by seventeen major investment firms with actual results. Their findings are reported in **Expectations and the Valuation of Shares**, *Working Paper No. 471*.

Economists have recognized the importance of expectations, especially in the valuation of securities, for many years. The generally accepted theory is that security prices are determined by perceived risk and expectations about future dividends and price changes. That is, investors set the current price of a stock so that its expected dividends and price changes will provide a rate of return commensurate with its risk level. Unfortunately, there is no way to observe or measure those expectations directly.

Cragg and Malkiel use analysts' forecasts of the future growth of earnings as a proxy for market expectations. The seventeen securities and financial firms that participated in the study provided both one-year and five-year forecasts of earnings that they had made for 178 companies from 1961 through 1968. The forecasts obviously do not precisely depict general market expectations, but they are representative of the expectations of some of the largest investment institutions. Cragg and Malkiel also point out that, insofar as other analysts and investors use the same type of procedures as the analysts in the study, the forecasts should at least reflect general expectations.

Cragg and Malkiel first examine the extent of con-

sensus among the forecasters and the accuracy of their predictions. They find that the forecasts are similar, but also reflect a considerable amount of disagreement. The consensus is greater for the five-year earnings forecasts, but even with those, only half of the variance in any one prediction can, on average, be explained by its agreement with the others.

The analysts' performance overall is mediocre at best. Cragg and Malkiel test the accuracy of the forecasts by calculating correlations between predicted and actual earnings growth, and by computing "inequality coefficients." Both measures support the conclusion that the one-year forecasts are poor and the five-year forecasts only slightly better. The analysts' predictions are better than ones that could have been made by mechanically extrapolating past growth rates, but price-earnings (P/E) ratios proved to be as accurate as the analysts' forecasts, and often better. Cragg and Malkiel conclude that the value of analysts' earnings forecasts is open to serious question.

Next, Cragg and Malkiel examine whether the expectations reflected in the forecasts are "rational," in the sense that they take all available information into account. There are not enough data to perform many of the standard tests of rationality, but Cragg and Malkiel do find that there is no combination of analysts' forecasts and historical information that would yield consistently better predictions. This implies that there is no systematic relationship between past and future earnings growth that is not incorporated in the forecasts. On the other hand, the fact that the P/E ratios are as good as the average of the analysts' predictions, and sometimes better, suggests that there is no more information in the forecasts than is already contained in stock prices.

Finally, Cragg and Malkiel explore the relationship of the forecasts to stock valuations. The classical capital asset pricing model assumes that investors have homogeneous (that is, identical) expectations. Cragg and Malkiel use a slightly different valuation model that allows for varying expectations among investors. Their "diversification model" assumes that investors assess individual securities in terms of how they will fare, relative to a finite number of risk factors.

In testing their model, and the hypothesis that earn-

ings forecasts play a major role in the evaluation of expected returns, Cragg and Malkiel include changes in national income, interest rates, and inflation as risk factors. They also include the covariance of a stock's returns relative to the market as a whole—the classical measure of risk—and the dispersion (or variance) of the earnings forecasts across predictors. All of the factors had a statistically significant relationship with stock returns in some of the years in the sample period; inflation and interest rate risk are of particular importance later in the decade (1960s). The variance of forecasts had the strongest relationship of all, however. Moreover, the variance of forecasts retained its highly significant relationship when it was included in a multiple regression with the other factors. The variance of the forecasts may well be a most satisfactory expectational proxy for a variety of systematic risks.

The statistical tests are not strong enough to conclude that the diversification model is the correct one, or that earnings forecasts provide an accurate measure of expected returns. Cragg and Malkiel do conclude, however, that the forecasted growth rates and the variance of the forecasts give a closer account of the valuation of securities than the classical asset pricing model or other valuation models. AE

## Inflation and Household Saving

According to NBER Research Associate **Edward J. Kane**, the macroeconomic authorities made two mistakes in 1966: first, they allowed inflation to escalate, and second, they extended deposit-interest ceilings to thrift institutions. The interplay of these two phenomena changed saving patterns in ways that greatly destabilized the economy, Kane writes in *Working Paper No. 470, Accelerating Inflation and the Distribution of Household Savings Incentives*.

In the period since 1966, the aftertax real rate of return on the financial assets accessible to households of moderate means has been negative. With passbook savings at 5.25 percent for a good part of this period, those in the 30 percent tax bracket earned only 3.68 percent, a return much below the average rate of inflation. Thus savings invested in so-called regulated financial assets lost value with every passing year.

In the absence of interest rate ceilings, market forces would have pushed deposit rates sufficiently high to afford the moderate-bracket saver a positive yield, Kane suggests. Since this did not happen, the saver had to reallocate his transactable wealth. But where could he go? High transaction costs prevented him from venturing into the bond and stock markets. The only feasible way to preserve and enhance the value of

savings was to invest in real estate, durables, and collectibles. This was the avenue increasingly traveled.

From 1962 to 1970, householders under age 25, who are for the most part modest earners, greatly increased their participation in the real estate market. In 1962, only 6.2 percent of households whose heads were younger than 25 owned their own homes (according to a sample collected by the Survey Research Center of the University of Michigan). By 1970, that proportion had reached 20.3 percent. In 1962, households of younger people had only 8.8 percent of their transactable wealth in home real estate equity; eight years later, they had 36.1 percent.

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Households of older people followed suit—up to age 55, that is. Among those aged 25 to 54, the proportion of transactable wealth invested in financial assets declined sharply from 1962 to 1970, while that invested in real estate equity—either in their own homes or in other real estate—increased.

The oldest households—those with residents over 55—behaved somewhat differently. Finding the in-kind return from housing less valuable than the younger groups, these people shifted out of both real estate equity and low-yielding financial assets, such as regulated deposits and savings bonds. They moved their wealth into unregulated financial assets—stocks, marketable bonds, and mutual funds. And they transferred holdings of regulated deposits from passbook savings accounts to certificates of deposit (CDs).

Analyzing portfolio trends by wealth class as well as by age, Kane finds that, from 1962 to 1970, households in the first through sixth deciles (the first decile being the poorest) shifted dramatically from regulated financial assets to real estate equity. Those in the seventh decile showed no change, while those in the eighth and ninth deciles moved from real estate equity, stocks, and regulated financial assets mostly into high-yielding CDs. The wealthiest families (tenth decile) decreased the proportion of their portfolio in home equity and in regulated financial assets and increased the percentage in investment real estate, CDs, and marketable bonds.

Hence, to hedge inflation risk and preserve a positive real aftertax return on transactable funds, families of moderate means found it advantageous to substitute investments in housing and other real assets for traditional financial instruments. Artificially low de-

posit ceilings speeded the exodus of funds from thrifts and thus contributed to the decline in the recorded ratio of deposit institution inflows to personal income. In this way, Kane notes, ceilings reinforced the secular inflation in housing costs and at the same time reduced the pool of savings available for business investment.

To buy the real property that now appeared so attractive, the average saver had to assume an unprecedented amount of additional debt. Well-developed mortgage markets, combined with the favorable tax treatment of interest expense, encouraged individuals to leverage their savings sufficiently to purchase homes or investment real estate. This behavior does not betoken profligacy, but emerges rather as a rational response to the needs of the times. Aggregate household saving, says Kane, is alive and well. It is merely taking unconventional and increasingly risky forms.

The coexistence of inflation and interest rate ceilings has had a differential impact on the wealth of American families. The poorest households have been hurt because they have not been able to protect their wealth position by buying real estate. Even now, less than 10 percent of the poorest families own real property.

The wealthiest and oldest families have also suffered because they own a great deal of common stock, and stock prices have failed to keep pace with inflation. Additionally, from 1962 to 1970, the most affluent shifted from home equity and traditional deposits into marketable bonds whose value subsequently declined. By contrast, the in-between wealth groups have fared relatively well because of their increased ownership of real estate and their willingness to take on historically high burdens of debt.

In altering his portfolio so decisively in favor of real as opposed to financial assets, the average household has acquired a measure of protection from unanticipated inflation. By the same token, however, he has become more exposed to the threat of disinflation. As he comes to realize this, Kane concludes, the average homeowner may begin to function as an explicit lobbyist for the continuation of inflationary policies. In this manner, the nature of portfolio shifts undertaken to protect household wealth from the effects of accelerating inflation may weaken national resolve to reverse the economic excesses of the past decade and a half.

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## Flexible Exchange Rates in the 1970s

In the 1970s, the international economy evolved from a system of pegged exchange rates to one of floating rates. NBER Research Associate **Jacob A. Frenkel** surveys and analyzes the key issues and les-

sons of that experience in **Flexible Exchange Rates in the 1970s**, Working Paper No. 450. Focusing on the dollar/U.K. pound, dollar/French franc, and dollar/Deutschmark exchange rates, Frenkel's work draws four principal conclusions:

1. Despite extraordinary turbulence, the foreign exchange markets appear to have operated efficiently.

2. The high volatility of exchange rates is an intrinsic characteristic of the foreign exchange market and is understandable if one views rates as financial variables (like gold or stock prices) that are strongly affected by expectations concerning the future and that adjust rapidly to new information.

3. During inflationary periods (like the 1970s), expectations of continuing inflation, and changes in those expectations, affect both nominal interest rates and exchange rates. Thus, changes in exchange rates are likely to be associated with changes in interest rates, and high nominal interest rates may be expected to coincide with a depreciated currency.

4. Exchange rates, when viewed as financial variables, reflect expectations for the future much more strongly than general price indexes do. So, during periods of frequent changes in expectations, for example the 1970s, one may expect deviations from the purchasing power parity doctrine, the classical explanation of exchange rates that relates exchange rates to current prices.

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Frenkel employs a monetary or asset market approach to exchange rates throughout his paper. He first examines the efficiency of foreign exchange markets during the 1970s. "One of the central insights of the monetary... approach to the exchange rate," Frenkel explains, "is... that the exchange rate... is determined in a manner similar to the determination of other asset prices and that expectations concerning the future course of events play a central role in affecting current exchange rates." If this approach is correct, then forward exchange rates (the exchange rates agreed upon for some future point in time) should reflect expectations about future spot (actual) rates. Analyzing monthly data for June 1973-July 1979, Frenkel does find "that the forward exchange rate summarizes the relevant available information about the future evolution of the rate." In that sense, then, the exchange rate market during the 1970s has behaved efficiently.

The link between expectations and exchange rates can further be expected to cause extreme volatility in

those rates during uncertain times like the 1970s. Indeed, Frenkel observes high volatility in the three rates that he studies, particularly on a short-term basis. Moreover, with rapidly changing expectations, future spot rates are extremely difficult to predict; forward rates are quite imprecise as forecasts of future rates. This is not surprising, in that forward rates reflect current information, while future rates reflect new information that has altered expectations. Frenkel examines predicted changes and realized changes in the three rates during the 1973-79 period and finds that "predicted changes... account for a very small fraction of actual changes."

If new information is so important, Frenkel speculates, then it should affect both spot rates and forward rates in a similar manner. According to the data from the 1970s, this is true: Frenkel observes a high correlation between movements in spot and forward rates. Such a response to new information is typical of stock and durable asset markets as well as foreign exchange markets; a prime example is the gold market of the 1970s.

In the next section of the paper, Frenkel looks at the relationship between interest rates and exchange rates. In the typical analysis, a negative association between the two is predicted. One way that this may occur is if high interest rates attract foreign capital, leading to a surplus in the capital account of the balance of payments and an appreciation of the domestic currency (that is, a lower exchange rate). However, the predicted negative relationship is not in accord with the facts. In the 1970s, rising interest rates in the United States have been associated with a depreciation of the dollar (higher exchange rates). This is consistent with Frenkel's monetary approach to exchange rates. In the monetary analysis, a rise in domestic interest rates due to a rise in expected inflation is likely to reduce the demand for money. For any given money supply path, monetary equilibrium requires a higher price level. If the path of foreign prices may be taken as given, the rise in domestic prices requires an increase in the spot exchange rate (that is, a depreciation of the currency).

In the short run, the traditional negative relationship between interest rates and exchange rates may hold. Interest rate increases may be the short-run result of tight money, inducing an appreciation of the currency. However, in an inflationary environment like the United States in the 1970s, interest rates are far more likely to vary with inflationary expectations than with liquidity effects (changes in the amount of money in circulation relative to other assets). The implication of Frenkel's analysis, therefore, is that "policies that attempt to induce an appreciation of the currency should aim at reducing inflationary expectations."

The third section of the paper looks at the link between exchange rates and prices. The theory of purchasing power parity, traditionally used to explain movements in exchange rates, holds in the long run if most economic shocks are monetary and do not affect relative prices. However, the 1970s have been characterized by other types of shocks—an oil embargo, commodity booms and shortages, and productivity differentials between countries, for example—that result in changes in internal relative prices and in systematic deviations from purchasing power parities. These deviations arise primarily because price indexes are far less sensitive to news that changes expectations than exchange rates are. To demonstrate this, Frenkel goes back to the 1973-79 data and looks at mean monthly changes. He observes spot exchange rates changing an average of 2.0 percent per month, while cost-of-living indexes vary from a low of 0.4 percent a month in Germany to a high of 1.2 percent per month in the United Kingdom.

Are these variations in exchange rates excessive? Not when compared with the prices of other assets, Frenkel finds. For example, while spot rates have varied about 2 percent per month, stock market indexes have varied anywhere from 3 to 6 percent per month. Frenkel concludes that "while exchange rate changes have been large relative to changes in national price levels, they have been considerably smaller than changes in the prices of other assets like gold, silver, many other commodities traded in organized markets, and common stocks."

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