DEPARTMENT OF FINANCE

College of Business Administration

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Chair's Corner

Scott Besley

I think you will find this issue of the Department of Finance newsletter very interesting. The articles deal with topics that are both quite interesting to investors and timely given recent events in the financial markets and the U.S. economy. In some cases, the authors have expressed opinions that might appear radical compared to the status quo. Perhaps such suggestions will generate constructive discussion relating to the topics. As always, any opinions expressed in the articles are those of the authors and do not necessarily represent the opinions or policies of the University of South Florida.

The new academic year is in "full swing." The demand for finance courses continues to be strong. Undergraduate courses fill to capacity very soon after registration begins; graduates courses remain popular as well. In both programs, we continue to seek ways to improve the quality of the education we offer. Students represent both our customers and the products that we offer to businesses. In an effort to make our students more marketable products, we continue to evaluate our programs to ensure that the pedagogy we offer is technologically current and provides outstanding preparation for success in "real-world" business. One method we use to gather information about our programs is an alumni survey, which you might recall was included in the last newsletter. The response to the survey was great. Your feedback will help us evaluate our programs and modify them appropriately to ensure we continue to offer a quality product to the business community. Thank you for taking the time to return the survey.

As I mentioned in the last newsletter, we also plan to bring the "real world" to the classroom by developing an investments program in which students manage a portfolio of securities that are purchased with "real" funds. The experiences students will attain from this program will significantly enhance their worth in the financial services marketplace. If you have suggestions or are interested in helping us develop this or similar programs, please contact me at 813-974-6341 or sbesley@coba.usf.edu.

Many of you attended the corporate governance conference that was hosted by the department on December 3, 2002. The conference was a huge success. We had an overflow crowd of approximately 150 people. Feedback from the attendees was that the program was "top-notch." Quality speakers like Tom James, CEO and President of Raymond James Financial, Jim Hale, Executive Vice President and General Counsel of Target Corporation, E. Norman Veasey, Chief Justice of the Delaware Supreme Court, and Randall S. Kroszner, member of the President's Council of Economic Advisers ensured the success of the program. An electronic version of the conference program can be accessed online at http://coba.usf.edu/departments/finance/program.doc. We plan to present similar conferences annually. If you were not invited to the first conference and would like to be invited to future conferences, please e-mail me.

The annual "Free Enterprise Dinner" hosted by the College of Business Administration will be held Thursday, February 27, 2003 at the Hyatt Regency Downtown. The honored guest this year is Les Muma, President and CEO of Firserv, Inc., a company that provides information management technology and related services to financial institutions worldwide. Mr. Muma is an alumnus of USF and a major contributor to the College. The dinner is a major fund raising event for the College of Business Administration. If you are interested in attending the dinner and do not receive an invitation from the College, please let me know. Tables, which include 10 tickets, cost $1,500; individual tickets are $100. If you purchase a table or an individual ticket, you can designate that the amount above the cost be contributed to the Department of Finance. Simply indicate on the RSVP that you would like the department to receive the contribution.

This newsletter is only as good as you, our alumni and business supporters, make it. Each issue will present informative articles and news. Please send us information on your recent accomplishments, job changes, newsworthy items, and other information that you would like to share with us and other supporters of the Department of Finance. Send any information, questions, or other material to Murad Antia. Murad can be reached via e-mail at mantia@coba.usf.edu or via regular mail at the return address provided at the end of this issue.

Returns and Volatility Linkages in the International Equity and Currency Markets

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During the past decade, the various economies across the world have experienced a tremendous increase in globalization. This increase in globalization has presumably led to an increase in the integration of financial markets. A perceived by-product of this increased integration is that economic shocks or events in one country that impact its financial markets (e.g., bond, equity and stock markets) might lead to shocks or changes in the financial markets of other countries. In other words, changes in one country's financial markets could *spillover* to the financial markets of other countries. There is some evidence that at times this in fact does occur. An example of this is the Asian financial crisis in 1997-1998 that started in Indonesia and spread to the financial markets of surrounding countries. This crisis, which is just one example of the impact that financial markets in one country can have on the financial markets of other countries, had a devastating effect on the region's financial markets and underscores the need to have an understanding of the underlying economic mechanism that leads to this spillover.

An important variable that has been shown theoretically to lead to changes in, say, the foreign exchange market that could affect equity markets is changes in interest rates. Although theoretically appealing, the empirical evidence in support of interest rates significantly impacting exchange rates is not particularly compelling. In general, the empirical evidence indicates that although changes in interest rates do have some impact on the foreign exchange markets, only about 10 percent of the changes in exchange rates is explained.

Equally as disappointing is the impact of exchange rate changes on equity markets. As is the case with currency markets and interest rates, there are elegant theoretical models that show that exchange rate changes impact equity markets. However, once again the empirical evidence does not provide strong support for these theoretical models.

The understanding of these relationships is of vital importance to several groups of economic agents. First, it is of interest to investors in their quest to reap the benefits of international diversification. Second, it is important to financial managers of multinational corporations in their attempts to manage exchange rate risk. Finally, it is of importance to regulators in their formulation of policy that could possibly protect their countries from the devastations of future financial crises.

In a recent *BusinessWeek* article it was pointed out that the "currency game" has now changed. The article points out that a quarter-point increase in the Euro-zone interest rate by the European Central Bank defied convention when the euro declined against the dollar.[1] However, the announcement that the $183 billion takeover of Germany's Mannesmann by the British mobile phone giant Vodafone AirTouch PLC caused the euro to increase by 2.5 cents against the dollar. The article noted that the impact of deals and stock prices on exchange rates became "powerfully apparent" in 1999 when the yen failed to react to policy initiatives by the Bank of Japan but reacted significantly to stock and business news. The impact of the currency market on the equity market is highlighted in another article that partly attributes the underperformance of the U.S. stock market in late 2000 to the third-quarter 2000 downward revisions in earnings due in part to a weak euro.[2]

These articles in the popular press indicate that with the increased globalization of financial markets, relationships between currency and equity markets may have changed and the importance of this issue led us to re-examine the relationship between these markets. In our paper, we address the issue of spillovers between currency and equity markets by seeking answers to the following questions. First, is there a significant price transmission from the equity market to the currency market? Second, does the currency market impact the equity markets in ways other than those suggested by the older theoretical models? An important, yet rarely examined, aspect of linkages between international financial markets is the economic factor(s) that leads to this interdependency. The third question that we examine is: What is the underlying economic mechanism that links these markets? As mentioned earlier a more complete understanding of these issues is of importance not only to academics, but also to investors, corporate treasurers, central banks, and regulatory authorities.

In seeking answers to the above questions, we looked at the relationship between the mean returns and their volatility for a system comprised of three financial markets—the U.S. stock market, the stock market of the foreign country, and the exchange rate between the United States and the foreign country. Our conjecture is that these markets are interrelated not only through their returns, but also through their volatility. This conjecture is based on the premise that new information generally affects financial markets, and as argued by the Nobel Laureate Stephen Ross, volatility reflects the arrival of new information.

In our paper, we created four systems. The four foreign countries were Canada, Germany, Japan and the United Kingdom. As a result, an example of one system is the U.S. stock market, the German stock market, and the exchange rate between these two countries. We use weekly returns in local currency for the United States, British, Canadian, German, and Japanese stock markets, and the exchange rate of each country against the U.S. dollar (USD).

Our results indicate that there are significant, bi-directional mean and volatility dependence between the equity and currency markets of the United States, Canada, Germany, Japan, and the United Kingdom. In the means, we find that the foreign exchange rate's most significant impact is on the U.S. and German stock markets, whereas the U.S. and foreign equity markets most significantly impact the

[1] See *BusinessWeek*, February 21, 2000, p.128.
[2] See *BusinessWeek*, December 4, 2000, p.157.

Deutsche mark (the German currency) and the Canadian dollar.

The volatility results are much stronger. The past volatility of each of the four currencies has a significant impact on the current volatility of both the U.S. and foreign stocks. This leads us to believe that one reason for the failure of several previous works to find exchange rate as a significant explanatory variable for equity returns is that they focused almost solely on the first moment, or mean. Past volatilities of the foreign and, more so, the U.S. stock market predict the volatility of the currency market, but generally with much weaker predictive power than the reverse. We also found strong volatility spillovers between the equity markets.

One of the important objectives of our paper is to provide evidence on the economic mechanism that leads to the interdependencies between these markets. We chose currency order flow between the United States and the foreign country contained in the system as the mechanism through which information is transmitted. The choice of this measure is based on several recent papers that show that currency order flow explains changes in the foreign exchange market as well as in the equity market. When we included currency order flow we observe some dramatic changes to the results. This is because, as expected, order flow economically and statistically significantly predicts both equity returns and changes in exchange rates. With the exception of the system containing the U.S. and U.K. stock markets and the pound, the spillovers displayed in both the mean and volatility across the markets are substantially weakened and in some cases disappear entirely. Thus, our findings indicate that the flow of information is one of the main factors that lead to spillovers across international capital markets.

In this paper, we set out to establish if there are linkages across international financial markets. Our results provide overwhelming evidence that these markets—the U.S. stock market, the foreign stock market, and the currency market—are interlinked, and these linkages manifest themselves more in the volatility of returns than in the mean of the returns. These findings imply that the perceived benefits from international diversification are not as large as they used to be. Additionally, they suggest that the volatility of both equity and currency markets need to be taken account by financial officers in their risk-management strategies and by regulatory officials when they are formulating international financial policy.

Finance majors often seek internships to apply what they have learned in the classroom and to gain valuable work experience. If your company is looking for an intern with a good understanding of finance, please let us know. We will be happy to recommend students that have the appropriate qualifications. Contact Scott Besley via e-mail at sbesley@coba.usf.edu. Please send a description of the responsibilities of the internship, a list of preferred qualifications for the position, and the name and contact information of the person to whom information about candidates should be sent.

Blame it on the Tax Code

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The recent bear stock market can be partly attributed to the decline in the quality of earnings reports. Earnings misstatements have reached epidemic proportions, leading to a considerable decline in investor sentiment. The reason for this conundrum can be explained partially by our convoluted tax code, which favors the issue of debt over equity by corporations.

Corporate interest payments are tax-deductible and dividends are not. If a company earns $1,000 dollars of operating income (EBIT) in a world with no corporate income tax, $1,000 is available to distribute to the stockholders and bondholders and it doesn't much matter whether the firm is financed with debt or equity.

Now assume there is a 40 percent corporate tax and that interest is tax deductible but dividend payments are not. If our firm has no debt, only $600 of the $1,000 EBIT is available for distribution to the stockholders because the IRS will collect $400 as taxes. The deductibility of interest payments makes debt financing a useful and legal way to reduce the IRS claim and make more money available to the suppliers of capital. If our firm issued $5,000 of 7 percent debt, deductible interest would reduce the tax bill to $260. So the firm becomes more and more valuable as it utilizes more and more debt. And the shareholders are the chief beneficiaries of this increase in value. Consequently, firms have huge incentives to issue copious amounts of debt. And the use of debt has exacerbated some of the problems faced by shareholders today. It can be shown that high levels of debt can motivate management to take big risks, especially if the managers hold a large amount of stock options.

We propose a way to mitigate some of these problems—let's make dividends on both common and preferred stock tax-deductible expenses for companies. Debt issues would no longer be advantageous relative to equity issues. In fact it could be disadvantageous because it would increase the risk of bankruptcy. There would be an incentive to issue common and preferred stock instead of debt and to pay out all earnings as dividends. In fact, a firm issuing only equity and paying out all earnings could reduce its corporate taxes to zero and maximize the value of the stock.

So what do we get out of such a proposed change in tax laws? Actually, quite a bit:

- First, we can expect to see a decline in debt financing. There would be little incentive to use debt. Its primary use would be for working capital needs. Less debt would lead to lower bankruptcy risk and firms will have

a better opportunity of recovering from poor economic conditions or poor management decisions.

- We would expect payout ratios to approach 100 percent. Failure to pay out all earnings as dividends would give rise to income taxes that could be avoided entirely and income taxes reduce funds available for payment to stockholders. Hence, a less than 100 percent payout will reduce the value of the stock.
- We should get much better earnings transparency. If firms payout less than 100 percent of earnings as dividends, investors might doubt the veracity of published financial statement data and question boards of directors, asking why they choose not to minimize corporate taxes. If the policy continues, we might expect new boards to be elected by shareholders. Thus, the board will expect management to report earnings that generate enough cash to pay out an equivalent amount in dividends. There will be less incentive for senior executives to manage earnings.
- It is possible that stock prices will rise because investors' risk aversion would decline. A 100 percent payout of earnings as dividends would assuage concerns about earnings management and manipulation.
- Pre-tax returns earned by investors should not change significantly. What would change is the way they earn their return. Now shareholders will receive more return in the form of dividend yield and a much smaller component in capital appreciation. In fact, if the firm pays out all earnings, the only capital appreciation should be in the form of the extra return earned on new value added ventures. If capital appreciation is modest, then the value of options granted to managers diminishes and the abuses associated with these options such as "cooking the books" should be reduced. Managers could be issued restricted stock as incentives to make up for the loss of stock options.
- Finally, if payout ratios approach 100 percent, management will find itself being forced into the capital markets periodically to raise equity capital to invest in value-added ventures. Seasoned companies could issue new stock via dividend reinvestment plans and warrants issued to existing stockholders. The services of an investment banker would only be required in the case of IPOs, companies in their infancy, and companies undertaking a significantly large new project. Because investment bankers underwrite most security issues, they have an incentive to assure themselves that all is well at the issuing firm because their own capital is at risk.

Are there any significant detriments to making the proposed change in the tax code? Maybe, but probably not:

- Some will argue that this change could eliminate corporate tax collections altogether and tax revenues would fall because employee benefit plans defer all taxes and individual investors might opt to do the same by shifting their investments into variable annuities. Modifications to the tax code could be implemented to make the changes tax- neutral.
- Personal taxes will increase as more dividends are paid out, but that may not be bad because after-tax income will be rising as well.
- Investors will not be able to defer taxes as they can do now by deferring realized capital gains, unless they transfer their investments into variable annuities, which have higher fees than mutual funds.
- It could be argued that a drastic change in the tax code as suggested here would unsettle the markets. While that is possible, we think the markets are remarkably resilient and adjustments would occur rapidly. In the past, significant changes in the tax code have seldom caused substantive problems.
- There would almost assuredly be a significant impact on the debt markets because there will be less incentive to issue bonds. There would be a dearth of long-maturity corporate bonds. Cumulative preferred stocks could very easily fill the vacuum. The advantage of the latter is that a confluence of adverse events would not force the firm into bankruptcy.
- The disadvantage of preferred stock is that excessive issuing would lead to more volatile earnings because the dividends are a quasi-fixed cost. Also, some of the problems with issuing too much debt would apply here. A company could issue an inordinate amount of preferred stock relative to common stock and then intentionally assume substantial risk in their business operations. If earnings are excellent, the preferred stockholders would get the normal dividend and the common stockholders would reap a huge windfall. Conversely, if earnings are poor, the preferred stockholders would get virtually nothing. We have a situation of limited upside gain with the potential for tremendous downside loss for preferred stockholders. Issuing convertible preferred and introducing protective covenants that would restrict future issue of preferred stock could alleviate this problem.

All in all, it seems that the benefits of a tax law making all dividends a deductible expense are great and the possible negatives few and minimal. We have some big problems facing us with respect to corporate treatment of shareholders. This is a simple way to address many of them. It's time for Congress to fix the problems; after all, it helped create them.

Some Recent (and Ancient) Myths About Stock Prices

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The recent drops in market prices have removed $8 trillion of paper wealth from the U.S. stock markets. From the first quarter of 2000 through October 2002, the Dow Jones Industrial Average fell by 25 percent and the S&P 500 Index fell by 42 percent. Indices registered their worst

performance since the Great Depression. These declines, following the ebullient bull market of the 1990s, have generated a large volume of sage comments, including numerous saying "I told you so".

A wave of contrition on the parts of investment advisors, CEOs, and accounting professionals has emboldened numbers of observers, including some well-known economists, to explain not only why everyone should have expected the market's chastening, but also offering fearless predictions about the future performance of the markets. A number of shibboleths have been revived and bandied about in the financial press. This article examines nine of these. First, we summarize a variant of the reigning financial stock price model—the simple version of the *discounted dividend model* in which firm growth is assumed to be constant. Our working specification of this model, based upon the simplifying assumption that Company X's current dividends will grow at a steady future rate, "g", is:

$$P_x = \frac{D_1}{R - g}$$

The equation states that the price of Company X's stock, P_x, is the value of next dividend payment, D_1, divided by the difference in investors' required return for the stock, R and the expected (constant) future growth rate of the company's dividends, g. R, in turn, is separated into a risk-free rate and a risk premium that investors must expect to earn if they are to hold the stock in their portfolios.

$$R = RF + RP$$

Finally, the risk free rate can be divided into a "real" component, r, that reflects investors' inter-temporal rate of substitution of current for future consumption and an "inflation premium", E(I), that adjusts returns for the market's expectation of upcoming inflation.

$$RF = r + E(I)$$

Although the risk premium is thought to vary from stock to stock, it also is described as having an average, or "portfolio" value that reflects investors' perceptions of the risk of stocks as a class of assets. While the risk free rate, RF, and dividends, D_1, are readily observable, the remaining factors in the model depend on the perceptions and expectations of investors.

To see how much these factors limit the predictability of stock prices, consider an average stock that is priced according its discounted dividends:

$$\$100 = \frac{\$4.00}{0.08 - 0.04}$$

$$RF = 0.05;\ r = 0.02;\ E(I) = 0.03;\ RP = 0.03;$$

Assume now that the Federal Reserve Board at first slows the economy by raising interest rates, and then sharply reverses course and drives the risk free rate down to 1.75 percent. Investors, burned, become concerned about future stock values and raise RP to 0.06, and investors' expected rate of inflation falls to 1 percent. At the same time, decreasing earnings lower dividends to $3.00 and investor expectations of dividend growth falls dramatically to 1 percent. These events roughly picture the stock market events of the past two years. The new discount rate 7.75% = 1.75% + 6%.

$$\$44.44 = \frac{\$3.00}{0.0775 - 0.01}$$

The example shows that even a moderate decline in earnings and dividends, when accompanied by adverse adjustments to investor expectations and confidence, easily leads to stock price declines of the magnitude experienced recently. Let us turn to some alternative views of the stock market.

1. *Markets are efficient.* One interpretation of this statement is defensible. The other is not. The first interpretation is that all relevant information is factored into stock prices. It is not possible, then, to identify patterns of past behavior, or other information that the market "missed," and outperform other investors. Finance theorists agree that much of the observed variation of stock prices reflect the arrival of new information in the market.

   A second interpretation of the "markets are efficient" statement argues that current prices correctly identify the "true values of stocks." In other words, stock prices are unbiased predictors of future stock returns. Finance theorists do not vouchsafe this second interpretation. Finance does not know how investors process new information and how new data interact with stock prices to mold investors' changing expectations and perceptions of market risk. Indeed, the discounted dividend model, while identifying the factors that are important in determining a stock's market price and how investor expectations and beliefs enter into stock prices, is largely silent on how these other factors are determined at a point in time. And statistical analysis has not been able to demonstrate that stock prices are unbiased predictors of future earnings. We thus have our first misconception; one that is associated with academic finance.

Over the centuries market observers have generated a number of aphorisms, many reflecting the tendency of mankind to apply human qualities to physical and economic phenomena. Observers, that is, have "anthropomorphized" the market. The market is portrayed as a sentient being, a human-like entity that pursues non-comprehensible goals. The market is described in such in terms as "cautious," and "disliking risk," "ebullient or exuberant," and "tentative, or uncertain."

Of course, if the market is perceived as human-like, some images, such as "the market is seeking its bottom," do not bear too much reflection.

Naturally, such statements are meant to apply to market participants, most of whom are, contrary to the opinions of financial columnists, sentient beings. It is investors who are cautious, risk averse, and who may be "seeking the market's

bottom." It is those investors whose expectations and perceptions are so hard to predict.

Let us evaluate some claims about the market.

2. *The future prices of stocks can be known.* Observers can, and continually do, predict the market. The problem arises when these predictions are presented as fact. The fact is that the market cannot be predicted, especially in the short run. It is easy for analysts, at the end of the day, to explain why the market did what it did. Just do not ask them to predict what will happen tomorrow, and do not keep track of their predictions over any length of time. What seems to be true is that industries follow the long-term growth of the economy. Over the long haul, the components of returns, such as RF and RP may be "mean reverting," which means they move around long-term average values. As the economy grows, **earnings and dividends will grow** as firms apply new capital to productive investments. Perhaps it is only in this sense that the market can be predicted.

3. *Sellers make the prices of stocks go down and buyers make them go up.* In fact, the market can fall and rise on light trading days. Prices reflect the changing expectations of investors. It is possible that these expectations change overnight and result in a large change in equilibrium stock prices before the first trade of the day. Trades then *reveal* the new market conditions. But they do not cause them.

4. *The volume of trading is associated with stock prices.* This is a corollary to the idea that trading moves stock prices. There is a kernel of truth to this assertion, and it is associated with the developments in the underlying economy. The reasoning goes to the role of new information. When markets are changing rapidly, a plethora of new data may lead to re-evaluation of expected stock performance in light of savings and portfolio goals, and lead different groups of investors to trade stock ownership. However, volume itself has no more to do with what stock prices should be than the number of persons on an elevator predicts whether it is going up or down.

5. *Volatility is bad for the market and depresses stock prices*. There is a kernel of truth here also. If a class of assets moves strongly with changes in wealth and economic performance, finance argues that they will carry a heavy market risk premium. For this reason, many analysts believe that stocks as a class carry a risk premium. But month-to-month changes in stock price volatility stem from the changes in the amount of new information coming into the market and how investors process that information. New information may be good or bad. And over the business cycle good new and bad news come in waves; and good news leads to volatility too. No one complained about the volatility surrounding the bull market of the late 1990s when the "New Economy" was supposedly rewriting the laws of economics.

6. *Look to past stock market behavior, to predict future behavior.* There is a small army of "technical analysts" who believe fervently that they can divine the future of the stock market by examining the entrails of its past behavior. Rigorous statistical analyses fail to find support for their beliefs. There is a good reason for this. If patterns of behavior do emerge from stock trading and this becomes known, every day trader and her father-in-law will jump on the bandwagon to exploit them, and they will be arbitraged away. This is the other barrel of the efficient markets shotgun. New information, including past patterns of behavior, is incorporated into stock prices. Current prices reflect the information and so it becomes irrelevant for pricing stocks.

Three corollaries of this last misconception have gained general currency during the current market slump. Proponents cite them to bolster dark predictions of the future of equity prices in coming years.

7. *If P/E ratios are above their historical average, stocks are over-priced.* Certainly, in hindsight, stocks in the late 1990s appear to be "overvalued" as reflected in very high P/E ratios. However, if we refer to the discounted dividend model, there are good reasons why many of the determinants of prices, given earnings (or dividends), may vary widely for significant periods of time. Expected dividend growth, the inflation premium, and the risk premium may vary over time for good reasons. All of these lead to changes in the P/E ratio.

8. *Stock prices have not bottomed out.* Commentators have made this claim since the beginning of the year, and their predictions as of October were borne out. You will never convince them that they could not have known this as a fact, but, in practice, it would be very difficult to know. If one argues that the market is over-priced, the question arises as to why other investors are keeping it so. If you argue that other investors are behaving irrationally, how can you predict what these irrational investors will do in the future? *The Economist* magazine, having correctly forecast the bursting of the "new economy" bubble, feels justified in playing Cassandra including an anthropomorphism with distinctly digestive overtones—" …America's 'recession', defined as a period of growth significantly below trend…is far from over. Until Americas' excesses have been purged, robust growth is unlikely to resume."

9. *Stock prices will follow trends of past recoveries; or they will not.* Take your pick between these two alternatives. As predictions, both have supporting evidence. As statements of fact, neither can be supported. Again each either (a) presupposes knowledge of future events in the economy or (b) presupposes knowledge about the future behavior of investors.

What finance people *DO* know about the market boils down to a few stylized facts. First, over the long run

(decades) stock returns tend to be mean-reverting. This is one way of saying that over the long-run returns to stocks tend to grow at a rate of about 9 percent, which outpaces Gross Domestic Product by about 6 percent. Second, individual stock prices do react in rational ways to new information that can be tied to the company or industry. Third, stock prices rise in expanding economies and fall in recessionary times, as they react to changes in current and expected earnings and dividends—that is, stock prices are cyclical. Be careful, however, because, as Paul Samuelson famously remarked: "The stock market has predicted nine of the last five recessions."
Finally, over shorter periods (less than decades), stock prices and returns resemble a random walk with drift.

People will always predict the weather, political races, and the stock market. We can listen to the predictions and evaluate the supporting arguments. The old advice to "buy and hold" still is about as good a recommendation as the average punter can expect to get.

A Behavioral Model of Stock Market Investors' Impact on Consumption

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The purpose of this paper is to examine investment performance, consumption spending and investment spending in a context of an adaptive relationship. The paper suggests that consumer spending and stock market gains and losses interact in a "gradual diffusion" process. Investors adjust their consumption spending not only to their current income but also to their wealth. When they become convinced that recent stock market gains represent a permanent addition to their wealth, they allow themselves to spend some of it, thereby feeding back to sustain the economic growth and further boost the stock market. Thus, we would expect that the level of the stock market as measured by the Wilshire 5000 index and gross domestic product (GDP) and personal consumption expenditure (PCE) to be correlated. This hypothesis is empirically tested.

Price data for the Wilshire 5000 from December 1970 to December 1999 were used to calculate monthly returns and volatility. Gross Domestic Product (GDP) and National Income (Nl) data were obtained from the Federal Reserve monthly bulletins. The quarterly GDP and NI data were smoothed monthly (by evenly allocating to each month a 1/3 of the differential for that quarter). The 30-year period spanned by this study was particularly interesting for its economic variety of recessions, economic booms, alternating sub-periods of steep and low inflation, and sub-periods of declining stock market prices followed by a rather prolonged stock market boom.

Multiple ordinary least squares regression and autoregression models were used to test the hypothesis. Regression analyses were performed in which, (1) the three-month change in GDP, (2) prior three-month changes in consumer spending, (3) prior six-month changes in consumer spending and (4) Gross Domestic Investment in the concurrent six months served as the dependent variables. The independent variables in the sequence of regressions were the price changes in the Wilshire 5000 index over the previous three, six, 12, 18, 24 and 36 months. The results reveal the strongest statistical relationships with the three-month change in GDP and prior six-month change in PCE as the dependent variables, and 12- to 30-month change in the Wilshire 5000 as the independent variables.

From the results of the analysis, it is evident that investors/consumers gradually smooth their "wealth spending" and accelerate consumption as they become more convinced that the wealth gain is permanent. This is reminiscent somewhat of the "income smoothing" effect that was suggested many years ago by Friedman (1957).[1] Specifically, the results reveal that consumption wealth spending peaks at approximately 2.5 percent of the stock market wealth gain in the prior 12- to 24-month period, whereas concurrent effects are negligible. The results also provide a partial explanation for the length of the economic cycle in the 1990s. For example, it suggests that over 40 percent of the growth in consumer spending in 1998 and 1999 was attributable to gains in the stock market in previous years, contributing to strong GDP in the following years.

Similar regression analyses were performed with Gross Domestic Investment as the dependent variable. The statistical relationships are weaker in these series of regressions. Within this subset, the highest statistical significance was observed in the regression in which the past three-month price change in the Wilshire 5000 served as the independent variable. The implication of these results is that business investment spending responds faster than consumer spending to changes in the stock market. This may simply indicate that businesses are more opportunistic than consumers, trying to capitalize on a strong stock market in raising capital and financing new capital outlays and delaying new capital investments when the stock market is hostile to IPOs.

The wealth effect can have serious negative consequences in the event of a bear market. A sustained downturn in the market will reduce consumption spending, which in turn will reduce economic growth and result in a further decline in the stock market. This negative feedback loop could conceivably have dire consequences for the economy and the stock market. The stock market losses since 2000 have contributed to a profit recession and weakness in investment spending, even though the Federal Reserve took steps that may mitigate this effect. Monetary policy has to consider not only its direct effect on consumer and capital spending, but also the secondary and indirect linkage via changes in stock prices.

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[1] Friedman, Milton. *Theory of the Consumption Function*. Princeton University Press, Princeton, N.J, 1957.

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We also would like your feedback about the content of the newsletter. Specifically we would like to know if you find the content to be pertinent, interesting, and written with sufficient clarity. Because the newsletter is written for your benefit, we invite your suggestions regarding the kind of material that you would like to read. If you would like for us to publish an article that you or one of your colleagues may have written, please send us a copy and we will give it careful consideration.

Thank you,

Murad Antia, Editor

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