

## Information in Financial Asset Prices

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### Central Bank Policy, Inflation, and Stock Prices

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#### Discussion

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Giammarino's paper raises two important issues. The first is the impact of inflation on stock prices. The second is whether central banks should use monetary actions to prevent the creation of bubbles in stock prices.

#### Inflation and stock prices

Stock prices can be valued using a dividend-discount model. Thus, as this paper indicates, stock prices will only be a perfect hedge against inflation if two conditions are met:

- the real rate of return is not related to the level of inflation;
- the firm's free cash flows, after taxes and measured in constant dollars, are not affected by the level of inflation.

The second assumption will only be valid if:

- real activity is not affected by inflation;
- free cash flows, after taxes and measured in constant dollars, are not affected by inflation when real activity is not affected by inflation.

As Giammarino indicates, there has been a lot of evidence for some time that stocks have not been a perfect hedge against inflation. Furthermore, market reactions to inflation news certainly bears out that fact. The question is not whether or not inflation will impact stock prices, but how or to what extent?

#### **Are free cash flows after taxes affected by the level of inflation in the absence of an impact on real activity?**

Fama (1981) concludes that the negative relation between inflation and stock prices is spurious (i.e., inflation will only affect free cash flows through its impact on real economic activity). Kaul (1990) finds support for that hypothesis. Including a variable for real activity in the econometric models reduces the significance of the inflation variable.

However, such findings contradict the conclusions of several research papers in the financial-management field. These papers find that, although firms will benefit from inflation through inventory gains and reductions of the real value of debt contracts, they are penalized by way of reductions in the real value of tax-related credit resulting from asset depreciation, added taxes on inflated profits caused by inventory gains, and increasing needs for working capital.

Two types of studies have looked at the impact of inflation on free cash flows. Higgins (1989) developed an equation that can be used to measure the impact of inflation on real sustainable growth. Sustainable growth is defined as the level of real growth in sales that can be sustained without a deterioration of the financial structure of the firm or a decline in the dividend yield. Using this approach, I found that inflation can severely hinder a firm's ability to grow unless it is willing to accept a deterioration of its financial structure or a reduction of its dividend payout. Applying this approach to several firms, I found that a 10 per cent inflation rate can reduce real sustainable growth by as much as 6.5 per cent for capital-intensive firms. Furthermore, an econometric study by Bourgeois and Lavallee (1993) found that stock market returns are negatively correlated with a variable that measures the difference between the growth rate in excess of sustainable growth.

Lastly, a study by Jenkins (1976) looked at the impact of inflation on the real cash flows, after taxes, of manufacturing and non-manufacturing firms in Canada between 1965 and 1974. He found that the tax-related effects and working-capital effects reduced the manufacturing firms' free cash flows (measured in constant dollars) by an average of 8.8 per cent per year.

Thus, there is also some evidence indicating that inflation may in fact, over time, impact the value of a firm even if real activity is not affected. Firms may choose to maintain their real growth by adding financial leverage, but in such situations the financial risk of the firm may also be modified. This raises a fourth way in which inflation may affect stock prices; if we assume that inflation can affect real growth and free cash flows, then inflation is also likely to help push up the risk premium on stocks.

### **The impact of inflation on the real rate of return**

Several arguments can be used to explain the fluctuations in the real rate of return (defined as the difference between the yield on a risk-free asset and expected inflation). A first argument is taxation. If investors are concerned with real after-tax returns, they should know that an increase in inflation of 1 per cent will require a greater increase in the real rate of return (before tax) in order to maintain the same level of real after-tax return. However, the increasing presence of non-taxable entities such as large pension funds helps to minimize this effect.

A second, more acceptable argument is that the price of financial assets, like the price of other types of assets, is also determined by the supply of and demand for capital. If we accept the argument, discussed by Geske and Roll (1983), that government deficits are at least partially monetized and therefore may contribute directly or indirectly to a higher level of inflation, periods of high inflation may also indicate a crowding-out effect. Thus, if the demand for capital is greater than the available capital because of large government deficits, the real rate of return may increase.

This may help us understand why the real rate of return is lower now than in recent years. Now that government borrowing needs are negative, institutional investors are facing, for the first time in several decades, a situation of asset rarity. In other words, increased financing by corporations has not filled the void left by the lack of government borrowing. This situation has helped cause growing investor interest in riskier assets, thus pushing down the risk premium on these assets. Therefore, smaller government deficits or large surpluses may help maintain a lower level of inflation and lead to a still-lower real rate of return and smaller risk premiums on risky assets.

### **Does inflation impact real economic growth?**

As Giammarino states, several researchers believe that inflation will affect stock prices through its impact on real activity. It is logical to assume that periods of higher inflation will often trigger a more restrictive monetary response, which may help slow economic growth. Inflation may also lead to a less stable economic environment, which may contribute to a higher risk premium on stocks. Thus, there may be a signalling effect associated with inflation. Investors may associate higher inflation with restrictive monetary policy and economic instability.

### **Stock market bubbles and central bank intervention**

One of a central bank's objectives is to provide price stability and protect the purchasing power of the nation's currency. Should the role of the bank be extended to wealth inflation? A market crash can have serious consequences on economic stability, especially if the asset bubble has existed for a long time. As Giammarino indicates, economic decisions may have been based on overvalued collateral.

However, we seriously doubt that anyone can determine the existence of a stock market bubble. Over the last two years, institutional investors have been bombarded by studies from academics and stock analysts, and by comments from central bank authorities, indicating that the stock markets were overvalued by as much as 20 per cent. Since then, stock indices have increased by 55 per cent in Canada, 67 per cent in the U.S. and 110 per cent in Switzerland. Nevertheless, we are still being told that the equity markets are overvalued by about the same percentages (5 to 20).

It may be true that equity prices are too high, but how do we determine if assets are overvalued? The average dividend yield in Canada is now about 1.6 per cent. Using a dividend-discount model, we could show that the current level of the stock market index would be consistent with its equilibrium values if the expected growth rate of dividends and profits (assuming a constant payout ratio) was 1.7 per cent below the required rate of return on the index. For example, the stock market index would not be overpriced if the growth rate of profits was 8.3 per cent per year and the required rate of return was 10.0 per cent. Thus, in determining if assets are overpriced, one must estimate the required rate of return.

Based on historical data and on the work of Ibotson and Sinquefeld, the risk premium over long government bonds has been estimated for a long time to be in the range of 5 to 7 per cent on average. However, a study by Guay (1994) indicated that the risk premium may be narrowing over time because investors now hold more diversified portfolios, and because of the growing role of large institutional players (such as pension funds), whose investment horizons are extremely long. As the investment horizon increases, the risk premium should narrow. Guay concluded that the risk premium of equity assets over long bonds may now be as low as 3.0 per cent, on average. This would indicate that the required rate of return would now be in the range of 8.75 per cent, and that a 7.0 per cent yearly nominal growth rate in profits would be required to justify current market levels.

Although it is on the optimistic side, a annual growth rate of 7.0 per cent is not so unlikely. According to a document published by Levesque Beaubien Geoffrion, aggregate profits have increased by 242 per cent in Canada and 171 per cent in the United States since 1993. Furthermore, corporate profits as a share of GDP are not excessively high on a historical basis. The ratio of profits to GDP has increased recently, but only because the economic slowdown of the early 1990s had lowered the ratio to its lowest level in 30 years.

Finally, one should not dismiss the impact of demographics on the demand for and pricing of financial assets. The demographic pyramid plays an important role in determining the demand for financial assets of specific risk levels. Pension funds are growing, contributing to an ever-increasing demand for equity assets. We now have in North America and in Europe the largest-ever group of traditional equity investors, individuals 35 to 50 years old. This age segment will remain dominant for another 5 to 10 years.

Thus, equity assets may be overpriced, but it is far from obvious that this overpricing is significant enough to warrant central bank actions, especially in the context of a sustained demand for equity assets.

### **Conclusions**

Giammarino's literature review concludes that stocks are not a perfect hedge against inflation. I have attempted to present other arguments indicating that its impact may be even more perverse. Inflation may affect:

- real economic growth;
- free cash flows after taxes;
- the real rate of return; and
- the risk premium on financial assets.

Inflation may also send negative signals that may lead market participants to overreact.

Finally, we should consider the *possibility* that the equity markets' strong performance may be justifiable in the current economic and demographic environment. Our experience and research on this topic have been tainted by 20 to 25 years of higher inflation, larger government deficits, lower productivity and unfavourable demographics for equity products. We are now living in a healthier environment, with which we have little experience.