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Inflation, Taxation, and Corporate Investment

As all investors are painfully aware, the real, inflation adjusted value of the stock market has dropped substantially since the late 1960s. And, as economic theory would predict, the decline in stock prices has been associated with a similar falloff in investment. New research by NBER Faculty Research Fellow **Lawrence H. Summers** suggests that the interaction of inflation and the tax system was a major factor behind both declines.

Summers examines the effect of inflation and taxes in the context of Tobin's Q Theory of investment in **Inflation, Taxation, and Corporate Investment: A Q Theory Approach,** *Working Paper No. 604.* His study also provides new estimates of the effects that various changes in corporate and individual taxes would have on investment and the stock market.

The Q theory, developed by James Tobin, holds that aggregate investment depends on the relationship between the market value and the replacement value of corporate assets. (The ratio of the two values is *q*.) The logic underlying the theory is that firms will invest in new assets only when their market values will rise by more than the cost of the investment. That is, it makes sense to invest in additional assets only if *q* is greater than 1.0. Otherwise, firms would be just as well off—or better off—distributing funds as dividends rather than investing them. According to the theory, an increase in the return to capital raises the market value of existing assets (and *q*), signaling the profitability of new investments, and companies respond by investing more. However, given the cost of adjusting to new conditions, as well as the lags in recognizing changes and implementing new plans, there is no reason to expect that all profitable investments will be made immediately.

Models linking market values to investment have been estimated before, but they have not been used to examine the impact of economic policies. Summers develops a method of using a Q model to estimate the effect on investment of changes in taxes on capital income. His model assumes that stock market values represent the present value of future profits. By calculating the effects of tax changes on profits, Summers can simulate the effects on market values and, in turn, the amount of capital accumulation.

His results suggest that changes in either inflation or taxes have "very substantial" effects on stock prices and investment. However, the full effects are slow to appear because the costs of adjusting to new conditions are substantial. For instance, Summers's simulations indicate that eliminating capital gains taxes would ultimately lead to a 29 percent increase in capital stock, but only a 4 percent increase in the first five years. Even so, it appears that the interaction of inflation and taxes accounts for a significant fraction of the declines in both stock prices and capital formation in the 1970s.

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Summers constructs a detailed Q theory model of investment behavior that differs from earlier models because it includes the effects of both corporate and personal taxes on market values and investment. His analysis shows that the distinction can be important because tax changes sometimes have different effects on market values and investment incentives: For example, a permanent increase in the tax rate on divi-

dends will cause an immediate drop in share prices, but will not affect investment decisions. The return to shareholders from new investments will drop, of course, but so will the opportunity cost of investing. The opportunity cost falls because shareholders get to keep a smaller portion of funds that are paid out as dividends instead of being reinvested. The tax on dividends explains why investment occurs when the *q* ratio is less than 1.0.

Summers uses his model to estimate the effect of inflation on market values and investment by simulating what happens when inflation rises from zero to 8 percent. Four characteristics of the tax system cause inflation to have real effects on tax liabilities, real profits, and investment. First, historic cost depreciation causes effective tax rates to rise with the inflation rate. Second, companies that use FIFO inventory accounting pay taxes on phantom inventory profits. Third, the deduction of nominal interest payments overstates costs and reduces effective tax rates. Fourth, the taxation of nominal capital gains instead of real gains leads to increases in the real pretax rate of return demanded by investors. On balance, the effects imply that inflation substantially increases the effective tax rate on corporate equity.

According to Summers's simulations, the immediate result of an unanticipated change from zero to 8 percent inflation is a 22.7 percent fall in stock prices. This, in turn, is associated with a 16.8 percent reduction in the rate of investment. Ultimately, the stock market falls 34 percent and investment 36 percent from what they would have been with price stability. The result suggests that inflation may account for much of what has happened in recent years. After a decade with inflation at about 8 percent, the stock market is nearly 30 percent lower than it would have been in the absence of inflation. The simulation indicates that investment should have declined by 22 percent, which is larger than the actual decline. Summers contends that the difference probably reflects the offsetting effects of increases in the investment tax credit and accelerated depreciation.

It has often been suggested that we remedy the investment-reducing effects of inflation by indexing the tax system. Summers simulates the effects that various types of indexing might have. His computations show that indexing depreciation allowances and inventory accounting, while doing nothing about the tax savings that companies get from deducting nominal interest payments, would result in a situation where higher inflation would actually lead to more investment. With full indexing at the corporate level, but no adjustment in the taxation of capital gains, 8 percent inflation would ultimately reduce the capital stock by 11 percent. Thus, the taxation of nominal capital gains apparently is responsible for about a third of the total reduction in capital accumulation caused by inflation.

Indexing capital gains, but not corporate taxes, leaves market values 27 percent lower and investment 25 percent lower (in the long run) than they would be with no inflation. This result suggests that, contrary to what some analysts have said, the deduction of nominal interest payments does not fully offset higher taxes from underdepreciation and inventory profits.

Summers also simulates the effects of several other possible tax changes. He finds that removing the investment tax credit would pare investment by 6 percent immediately and 9 percent over the long run. Also, announcing a reduction to 40 percent in the corporate tax rate four years in advance would have a larger short-run effect on investment than cutting the tax rate immediately. This is because firms would accelerate their investment plans in order to maximize depreciation write-offs before the tax rate—and the value of the write-offs—dropped. Ironically, that finding also implies that we could boost investment by temporarily raising the corporate tax rate. AE

How Good Are Business Cycle Dates?

Following a long National Bureau tradition of analyzing the quality of available economic data, NBER Research Associate **Victor Zarnowitz** presents evidence on the accuracy of gross national product (GNP) data and business cycle indicators in *Working Paper No. 608,* **On Functions, Quality, and Timeliness of Economic Information.**

The process of formulating economic aggregates is lengthy and complex, and subject to error at each stage. Typically, certain economic events are first observed and recorded. These *primary* data, based on sampling techniques, are subject to some error. The primary data are then processed into measures, or aggregates, and the particular procedures used may introduce more error. In a third step, the user adjusts and interprets the economic measures to his own purposes and concepts—this allows for further error. Combinations of these measures act as messages to users for application to decision making, but these messages may be misinterpreted or superseded by more recent events. Moreover, economic aggregates are subject to both short-term and benchmark revisions (the latter reflecting new economic and demographic information), so even those figures termed "final" may not be.

In this paper, Zarnowitz analyzes five sets of revisions, over the period 1958–78, of figures on quarterly

percent change in real and nominal GNP and the implicit price deflator (IPD). He finds the estimates for 1975–78 better than those for the earlier periods. He also finds the nominal GNP figures more accurate than the real GNP or IPD figures (perhaps because adjusting for the effects of inflation is both intricate and approximate).

Next, Zarnowitz considers two sets of revisions during 1975–80 in fifteen components of the leading, coincident, and lagging indicators. The poorest results (that is, largest errors) are found for the indexes of net business formation, real new orders and sales, plant and equipment commitments, residential building permits, change in liquid assets, real money supply, and commercial and industrial loans outstanding.

Zarnowitz then considers how well a given series measures the economic process in question. The quality of cyclical indicators has been estimated in the past to average 70 in a 0–100 ranking scheme, with some groups—for example, employment, commodity and stock prices, interest rates—ranked high, and others—such as job vacancies and capacity utilization—low. Zarnowitz ranks 110 cyclical indicators for *currency* (timeliness) and finds an average rank of 60 out of a possible 100. He ranks these same indicators for *smoothness* (that is, lack of very frequent and erratic changes) and gets an average of 73. Finally, he estimates the total lag in release of the preliminary data and in extracting the economic information (signals) from the final data. For monthly indicators, the lag is two to nine months; for quarterly indicators, four to seven months. Of the 110 indicators he analyzes, 41 have total lags of five or more months.

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In the final section of the paper, Zarnowitz reviews the experience of the early 1970s. The original GNP data for 1973 greatly underestimated the slowdown that was taking place, so "business analysts and forecasters generally failed to recognize (let alone anticipate) the onset and deepening of the recession." As a consequence, he notes, "Economic policies were predominantly restrictive until late in 1974." During this period, many people were misled by the strength and conflicting signals of the nominal aggregates. Particular events and measurement difficulties led to the problems with the data. Zarnowitz concludes that "in times of surprising events and strong shocks, measurement of short-term changes in the economy is particularly difficult, and current signals are often misinterpreted. . . . In more stable times, when the shocks to the economy are less concentrated, frequent, and severe, expectations should prove to be generally more accurate, and they are."

Black-White Earnings Ratios

Why has the ratio between earnings of blacks and whites increased more rapidly since 1964 than it had previously? Some economists believe that equal employment opportunity regulations, effective in 1965, raised the relative earnings of minorities. Others note that the expansion of antipoverty programs after 1964 allowed minorities who earned very little to withdraw from the labor market altogether: with a smaller supply of workers, the price of labor would rise. Also, when the low earners drop out of the labor force, the median level of earnings rises; this statistical effect is termed "sample censoring."

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In NBER *Working Paper No. 617,* **Black-White Earnings Ratios since the Civil Rights Act of 1964: The Importance of Labor Market Dropouts,** Research Associate **Charles Brown** attempts to estimate the importance of censoring to the post-1964 data on relative earnings of blacks.

Assuming that all of the dropouts from the labor market were among the lowest earners, Brown calculates a correction factor to use in adjusting the available, published data for the censoring effect. He finds that "60 percent of the male, post-1964 trend and half of the corresponding trend for females survives correction for censoring." In other words, about half of the relative gains observed in blacks' earnings since 1964 are real and not due to statistical miscalculations. "The corrected estimates," Brown concludes, "support the view that while censoring has exaggerated the relative improvement in black . . . earnings, it has not singlehandedly produced the improvement."

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