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Risk and Return

One of the best documented propositions in the field of finance, notes NBER Research Associate **Burton G. Malkiel,** is that, on average, investors have received higher rates of return on investment securities for bearing greater risk. So, he adds, "the quest for better risk measures is not simply an amusing exercise that accomplishes only the satisfaction of permitting academics to play with their computers. It has important implications for protecting investors." In *NBER Working Paper No. 700,* **Risk and Return: A New Look,** Malkiel examines several measures of risk and concludes that "no single measure is likely to capture adequately the variety of systematic risk influences on individual stocks and portfolios."

First, however, Malkiel looks at the historical evidence regarding risk and return. He defines risk as the chance that the expected return on securities will not materialize and, in particular, that the securities you hold will fall in price. Thus, academics have generally defined risk as the variance, or standard deviation, of returns. Historically, returns have been related to such a variance risk measure.

Next, Malkiel reviews "modern portfolio theory," which tells investors how to combine stocks in their portfolios to give them the least possible risk consistent with the return they seek. It also gives a rigorous mathematical justification for the time-honored investment maxim that diversification is a sensible strategy for individuals who like to reduce their risks. If one stock goes down in price, there is a chance that another stock in a portfolio will make an offsetting rise in price.

"Of course," writes Malkiel, "there is always a rub, and the rub in this case is that the fortunes of most companies move pretty much in tandem." If there is a recession, most companies and their stocks suffer at the same time. Nevertheless, since company fortunes don't always move completely in parallel, investment in a diversified portfolio of stocks is likely to be less risky than investment in one or two single securities. For example, old stocks often move in the opposite direction as the market. Similarly, an investor can diversify in stock markets outside the United States.

Malkiel then reviews "The Capital-Asset Pricing Model (CAPM)." This model focuses directly on what part of a security's risk could be eliminated by diversification and what part couldn't. He notes that there is "systematic risk" that arises from the tendency for all stocks to go along with the ups and downs of the general market, at least to some extent. The remaining variability in a stock's return is called "unsystematic risk." It results from factors peculiar to that particular company, such as a strike, introduction of a new product, and so on. Systematic risk cannot be eliminated by diversification, since all stocks move more or less in tandem. However, some stocks and portfolios tend to be very sensitive to market movements. Others are more stable. This relative sensitivity to market moves can be estimated on the basis of the past record, and this is popularly known by the Greek letter "beta."

Diversification does, however, reduce unsystematic risk resulting from factors peculiar to an individual company, such as finding a rich mineral lode on a company's property, discovering that a competitor has developed a new and better product, and so on.

> "...the best single risk measure appears to be the dispersion of analysts' forecasts rather than the traditional beta measure."

Indeed, Malkiel points out that by the time twenty randomly selected stocks are in a portfolio, the unsystematic part of risk is substantially eliminated. So the value of the portfolio should tend to move up or down with the general stock market. Thus, according to the CAPM, the unsystematic risk of each individual security is now irrelevant to its price. Investors will not get paid for bearing risks that can be diversified away. Otherwise, investors would buy up stocks with high unsystematic risk and higher returns, because those risks can be diversified away. In an efficient market, investors will bid away any advantage for stocks with high unsystematic risks. The only part of total risk that investors will get paid for bearing is systematic risk, the risk that diversification cannot eliminate. Therefore, the Capital-Asset Pricing Model says that returns

for any stock or portfolio will be related to a beta measure of risk.

However, tests of this theory have brought a number of "disquieting results" to light, notes Malkiel. The measured, actual risk/return relationship has been found to be weaker than implied by the theory. This divergence of theory from evidence is particularly striking in the short run. For some short periods, risk and return have been negatively related. Another problem for the theory is the instability of measured betas. Past betas for individual stocks are relatively poor measures of future betas, although this is somewhat less of a problem for portfolio betas. Moreover, there are serious questions about the appropriate market index to use in measuring beta or even whether it is possible to fully capture risk in this way.

Since beta is an imperfect measure of systematic risk, Malkiel looks at several other potential systematic risk elements for companies and their stocks that cannot be diversified away. These include national income movements, changes in interest rates, changes in inflation rates, and a new risk variable—a measure of the dispersion of views among Wall Street security analysts concerning the future earnings and dividend growth of a stock. Considering the latter factor, it might appear that the dispersion of analysts' forecasts would measure specific rather than systematic risk. Malkiel notes, however, that it may be a particularly useful measure of a variety of systematic risks. For example, analysts may agree on how a downturn in the economy (or an increase in interest rates) may affect a steel company but not agree on when a downturn will come or how severe it will be. Their forecasts for a drug company—less hurt by a recession—may be more similar. "Hence, differences in analysts' forecasts may be a most useful proxy for systematic risk in the broadest sense of the term," states Malkiel.

Testing these risk measures, Malkiel finds a statistically significant correlation between all of these measures and expected returns of individual stocks and portfolios. "Moreover," he states, "when several of these systematic risk influences are used together, a far better explanation of differences in expected returns is found than can be obtained using any single measure alone." And, Malkiel concludes, the best single risk measure appears to be the dispersion of analysts' forecasts rather than the traditional beta measure.

One implication of this finding, Malkiel maintains, is that so-called "yield-tilted index funds" may be a serious investment error. Such funds try to match closely the general composition of one of the broad stock indexes, such as the Standard & Poor's (S&P) 500 Stock Index, but their portfolios are tilted toward relatively high-yield stocks. Such funds were especially recommended for tax-exempt investors, since dividends are generally taxed more highly than capital gains. In addition, since the market equilibrium is presumably achieved on the basis of aftertax returns, the equilibrium pretax returns for stocks that pay high dividends ought to be higher than for securities that produce lower dividends and correspondingly higher capital gains. However, such funds use beta measures to match the S&P index. Beta may not provide a full measure of systematic risk in the market, and a yield-tested portfolio may be especially vulnerable during periods of rising inflation and interest rates. In fact, such funds did perform significantly worse than the market in 1979–80.   DF

Why the Decline in Black Teens' Employment?

In 1950, one of every two black male teenagers (aged 16–19) was employed; in 1970, one in three was employed and, in 1978, one in four. In *NBER Working Paper No. 683,* **The Decline in Black Teenage Employment: 1950–70, John Cogan** looks at the data and asks why the period from 1950 to 1970 saw such a fall in the employment of black teens.

Cogan first considers some explanations that are frequently suggested. For example, perhaps the growing decay of northern central cities has been the culprit. While it is true that the number of black teenagers living in the North increased 215 percent from 1950 to 1970, and that more than 90 percent of these teenagers lived in urban areas, Cogan finds that employment ratios for black teens in the northern industrial centers did not decline during this period. So, urban decay is not a valid explanation.

Another suggested explanation for declining black teenage employment is the growth of welfare. But welfare participation rates grew more than three times faster in the North than in the South during the 1960s, while employment ratios there held firm.

All of the decline in black teenage employment rates from 1950–70 was in the South. "Northern industrial labor markets showed a remarkable ability to absorb the large influx of black teenagers," Cogan observes. Even the 1950–70 increases in the black population and expanding school enrollments among black teens were fairly insignificant factors in the employment decline.

> "Virtually all of the observed loss in black teenage employment from 1950-70 was in the agricultural sector and in the South.... employment ratios for black teens in the northern industrial centers did not decline ..."

The primary cause of the dramatic decline in black teenage employment, Cogan's study shows, was the demise of the market for low-skilled agricultural labor. In 1950, over 45 percent of black teenagers who worked were employed in the agricultural sector; in the South, that figure was over 50 percent. Virtually all of the observed loss in black teenage employment from 1950–70 was in the agricultural sector and in the South.

This twenty-year period, from 1950–70, was one of rapid growth in agricultural technology. The capital/labor ratio nearly tripled, and output per worker more than tripled. Farm employment in the South declined by 65 percent, mainly due to technological progress, and this source of work for black teens virtually ceased to exist.

Moreover, black teenagers were not absorbed by the nonagricultural sector. In the South, the federal minimum wage acted as a barrier to that absorption. In sum, the two factors that were responsible, in equal measure, for the decline in black teenage employment from 1950 to 1970 were technological progress in agriculture and increased coverage of the minimum wage.

Modern Commercial Policy under Floating Exchange Rates

A new analysis of foreign trade policy, **Four Observations on Modern International Commercial Policy under Floating Exchange Rates,** *NBER Working Paper No. 715* by **J. David Richardson,** suggests that U.S. import barriers may be far more costly than generally believed. Richardson's conclusion is that quantitative commercial policies, such as "voluntary" import restrictions and "trigger prices" on foreign steel, reduce U.S. consumption possibilities more than most people realize, discourage capital formation, and have significant effects on exchange rates.

Using a model with parameters that approach U.S. values, Richardson finds that policies that shrink U.S. imports by 10 percent cause real income to drop by 1.6 percent. That is significantly larger than most other estimates of the welfare cost of trade barriers. Virtually all of the welfare loss comes in the form of higher prices for imported goods; contrary to intuition, barriers also cause the value of the dollar to fall.

Richardson's calculations also imply that equilibrium real wealth in the United States falls so that both present and future purchasing power decline. There are two reasons for real wealth to fall. First, it falls because real income falls. Second, it falls because of the change in prices brought on by barriers that reduce Tobin's *q,* resulting in less aggregate investment and lower capital stock than would have been the case without the change in trade policy.

A number of more general propositions also emerge in Richardson's analysis:

(1) The income transfers implicit in modern commercial policies (such as quotas) are more intricate and less innocuous than the transfers implicit in old-fashioned tariffs. Under tariffs, all of the transfer is collected by the country protecting an industry. In contrast, some or even all of the windfall revenues resulting from a quota will flow to foreign producers, since they can get higher prices for their output. The

distribution of these revenues can affect both private incentives and national economic welfare.

(2) Income transfers created by quantitative trade barriers force adjustments in commodity and asset prices, including the exchange rate. The changes in prices and exchange rates in turn affect real trade, including trade in financial assets.

(3) Modern commercial policy can either strengthen or weaken a currency in the foreign exchange market. Its impact on commodity trade generally strengthens domestic currency, but its impact on asset trade generally weakens it.

(4) Import barriers can either encourage or discourage aggregate capital formation by altering Tobin's *q* —the ratio of the value of productive capital to its replacement cost. That happens because barriers can have differing effects on the value of the current capital stock and domestic commodity and output prices. In most empirically relevant cases, barriers will reduce Tobin's *q* and discourage aggregate investment. The long-run result will be less capital per worker and lower real incomes.

Observations two, three, and four, which are most at odds with conventional wisdom, hinge on the ability of foreign exporters to capture some or all of the income transfers created by modern commercial policy. The usual view is that floating exchange rates diminish the effectiveness of trade barriers. If barriers do reduce imports, that improves the current account balance, which in turn strengthens domestic currency and makes imports comparatively more attractive again, frustrating the original goal of the barriers. Moreover, floating rates are occasionally said to be a self-corrective system that fosters trade balance (via appreciation or depreciation of a currency) and discourages protectionism.

> **"…policies that shrink U.S. imports by 10 percent cause real income to drop by 1.6 percent."**

Richardson maintains that looking only at the direct effects of quotas on commodity trade is too limited a perspective because it ignores the effects that a change in trade policy will also have on international asset preferences. Exchange rate adjustment will also be influenced by changes in capital flows, international portfolios, and domestic prices of globally traded assets that come in response to the change in trade policy. Richardson believes that this is where the international transfer perspective becomes most important.

If import barriers cause a short-run capital account deficit that exceeds the beneficial effect on the current account, a country's currency could depreciate. Or, if barriers raise domestic demand for tradable assets, then the domestic currency may depreciate in order to restore global equilibrium in the demand and supply of asset stocks. Finally, changes in exchange rates will cause capital gains and losses. The real value of equity claims on the domestic capital stock, as well as foreign financial assets and liabilities, will be affected by the exchange rate.   AE

American Industrialization, 1820-1850

"Industrialization . . . proceeds first in areas whose agriculture, for various reasons, puts a low value on females and children relative to adult men," according to the relative productivity hypothesis. In *NBER Working Paper No. 722,* **The Relative Productivity Hypothesis of Industrialization: The American Case, 1820-1850,** NBER Research Associate **Claudia Goldin,** and **Kenneth Sokoloff** of UCLA, examine the applicability of that hypothesis to the U.S. industrialization experience of the early 19th century. They observe that women and children in the early 19th century were relatively less productive in the Northeast than they were in the South, and it was indeed the Northeast where the factory system first evolved in the United States.

The authors rely largely on data from industrial censuses, such as the McLane Report of 1832 and the 1850 Census of Manufactures. According to the data, during the years between 1820 and 1850, the Northeast industrialized rapidly while the South remained predominantly agricultural. The proportion of the total U.S. labor force in agriculture dropped from 79 to 55 percent, while the decline was from 75 to 30 percent in the Northeast.

Prior to industrialization, the authors note, the relative productivity of women and children was low in northern agriculture (that is, the hay, wheat, and dairy sectors) and higher in the South (in cotton, rice, sugar, and tobacco growing regions). At that time, women and children in the North were earning about 30–35 cents for every dollar earned by a man, as compared to about 58 cents in the South. During the period of industrialization in the North, the relative wage for women and children rose to over 50 cents, still lower than in the South.

Between 1810 and 1832, the proportion of women aged 10 to 29 employed by factories rose from near zero to between 10 and 30 percent (depending upon the location). By 1850, 27 to 30 percent of the young women in Massachusetts and Rhode Island were working in manufacturing. Female and child labor comprised over 40 percent of the total manufacturing work force in New England in 1832, declining somewhat by 1850.

Women and children were able to move into factories in part because of the invention of new types of capital equipment and in part through a movement toward a greater division of labor in production. Southern firms tended to be smaller, allowing for a less intricate division of labor than in the North. As northern industry grew, more women than men migrated to it relative to their share of the total labor force. The women were young and single and able to leave their rural homes for brief periods of time.

As women moved into industry, their relative wages rose. They gained an average of 1.5 percent per year from 1815–1850, finally reaching 58 percent of men's wages by 1885 (where they have remained ever since).

At the same time the value of manufacturing output grew quickly in the North. By 1860, the ratio of mining and manufacturing to agricultural output was 8.7 times larger outside the South than in it.

> "...women and children in the early 19th century were relatively less productive in the Northeast than they were in the South, and it was indeed the Northeast where the factory system first evolved in the United States."

In sum, the authors observe in the North compared to the South: a lower relative productivity among women and children within agriculture; an earlier evolution of manufacturing; sharp increases in the relative wages of women and children; and, an expansion in the amount of manufactured goods produced. They conclude that "factors with low relative productivity in agriculture were instrumental in the initial adoption of the factory system and of industrialization in general in the United States. . . ." The economic position of women and children in the agricultural and traditional sectors appears to have strongly influenced various features of economic development. Thus, Goldin and Sokoloff suggest that their results may be applicable to contemporary phenomena in some developing countries.