

The NBER Digest

NATIONAL BUREAU OF
ECONOMIC RESEARCH, INC.

September 1990

Better Schools Pay Students Back

School quality pays off, according to a new study by NBER Research Associates **David Card** and **Alan Krueger**. Those who were educated in a state with more teachers per enrolled students, a longer school term, and higher-paid teachers earn more throughout their working lives than those educated elsewhere.

In earlier work, researchers have found that measures of school quality similar to those used by Card and Krueger have little or no effect on test scores. But in **Does School Quality Matter? Returns to Education and the Characteristics of Public Schools** (*NBER Working Paper No. 3358*), the authors conclude that better school characteristics increase the economic return to education. "We believe that success in the labor market is at least as important a yardstick for measuring the performance of the education system as success on standardized tests," they state.

Card and Krueger estimate the effect on earnings of additional years of schooling for a large sample of American men born between 1920 and 1949. They find that this "earnings effect" is higher than among those who were educated in states with higher-quality schools, regardless of where they currently live. For example, a decrease from 25 to 20 pupils per teacher in a class translates into 2.3 percent higher earnings in every year of a high school graduate's working career. Similarly, a 20 percent increase in teachers' pay is associated with a 1 percent increase in earnings. The benefits of higher-quality schools are much larger in the aggregate because they accrue to each student in the class.

Card and Krueger also find that the return to edu-

cation is higher for students who attended schools in states where teachers have higher average levels of education, and where the fraction of female teachers is higher. And, improvements in the quality of elementary and secondary schools increase the rewards to post-secondary education.

"Those who were educated in a state with more teachers per enrolled students, a longer school term, and higher-paid teachers earn more throughout their working lives than those educated elsewhere."

Finally, Card and Krueger note that school quality was significantly lower for black students than for white students in the segregated southern states in the 1920s and 1930s. By the early 1950s, however, most southern states had reduced or even eliminated this gap in school quality. Card and Krueger's analysis suggests that the rapid improvement in schools for black students substantially increased their returns to education, so that today the additional earnings per year of schooling are very similar for blacks and whites.

In their study, Card and Krueger use a national sample of over one million men from the 1980 Census. They use measures of school quality reported in the *Biennial Survey of Education* and the *Digest of Education Statistics*.
DRF

When Short-Term Rates Rise, Beware

Increases in short-term interest rates are bad news for investors who hold stocks, bonds, commodities, and assets denominated in foreign currencies. According to NBER researcher **Ken Froot**, since World War II an increase of one percentage point in short-term rates has been associated with an average decline of about 3 percent in the subsequent return on a broad range of long-term assets. For example, an increase from 8 to 9 percent in 12-month interest rates not only reduces the *current* prices of stocks, bonds, commodities, and foreign exchange, but also causes them to perform 3 percent more poorly over the next year.

In **Short Rates and Expected Asset Returns** (*NBER Working Paper No. 3247*), Froot finds a striking similarity in this diminished performance over different time periods and assets. For five foreign currencies (the pound, Deutsche mark, Swiss franc, French franc, and yen), three fixed-income instruments (Treasury bonds, 30-year mortgages, and newly issued municipals), the U.S. stock market (measured by the S&P500 and the NYSE value-weighted index), and three commodities (silver, lead, and nickel), a strategy of buying when interest rates are low and selling when rates are high yields a much higher return than a simple buy-and-hold strategy does.

The standard view is that if such strategies are to beat buy-and-hold, they must have high perceived risks. Otherwise, many investors would be inclined to buy long-maturity assets when interest rates fell, thereby driving up current asset prices and eliminating the strategy's return. By this logic, high interest rates are associated with *low* riskiness of other assets. However, that conclusion runs counter to experience, since stocks and bonds are more volatile when interest rates are *high*. During the 1970s, for example, high short-term interest rates were associated with increased volatility in bonds and stocks. Thus, there is no direct evidence that the standard explanation is correct.

Why else might investors do well to buy long-maturity assets when interest rates are low? Perhaps as short-term rates fall, some investors will believe erroneously that other asset returns also will fall. Those investors reduce the demand for, and therefore the current price of, other assets, leading to higher returns over the subsequent period. Indeed, it is possible that short-term interest rates are determined partially by the beliefs of these traders. When these traders feel optimistic, they borrow to finance the purchase of stocks, bonds, foreign exchange, and commodities. Therefore, short-term interest rates

may rise as a consequence of their overly bullish sentiments. Whatever the reason, if short rates reflect the sentiment of a major group of traders, then they may move inversely with other asset returns.

“An increase of one percentage point in short-term rates has been associated with an average decline of about 3 percent in the subsequent return on a broad range of long-term assets.”

Looking for evidence of this view, Froot uses surveys of investor expectations about stocks, bonds, and foreign exchange. He finds that the survey results fit the description of these traders closely: when interest rates are low, survey respondents expect stocks, bonds, and foreign exchange to perform poorly. By making systematic mistakes, these traders thus can induce a negative comovement between interest rates and asset returns.

Therefore, Froot suggests that investors can earn a better return by taking advantage of this strategy. Of course, those investors who have been exploiting this pattern all along could not have eliminated it completely, because they are wisely unwilling to bet very large fractions of their portfolios on it. Nevertheless, Froot concludes that portfolio performance is improved by moving out of long-maturity assets when interest rates are high.

Are Japanese Stock Prices Too High?

At the end of 1989, Japanese industrial stocks sold for an average of 53.7 times their annual earnings, compared with a multiple of 15.3 for similar U.S. firms. Differences in accounting practices between Japan and the United States make reported price/earnings (P/E) ratios for Japanese firms systematically higher than those for their U.S. counterparts, according to a new study by NBER Research Associates **Kenneth French** and **James Poterba**. These differences are not sufficient, however, to explain fully the disparity in P/E ratios between the two markets.

In Are Japanese Stock Prices Too High? (*NBER Working Paper No. 3290*), French and Poterba attempt to explain the wide divergence between Japanese and U.S. P/E ratios. While the magnitude of the P/E gap has varied over time, Japanese shares sold at higher multiples through most of the 1980s, with particularly rapid increases between 1985 and 1987.

French and Poterba find that the accounting rules followed by U.S. and Japanese firms differ in two significant ways. First, Japanese firms often report earnings only for the parent firm. These unconsolidated earnings do not include the undistributed profits of partly owned subsidiaries. Intercorporate shareholding is far more common in Japan than in the United States. About 30 percent of the shares on the Tokyo Stock Exchange are held by nonfinancial corporations and another 20 percent are held by banks. Therefore, the resulting errors in reported earnings can be substantial. Correcting for such consolidation effects would reduce the late-1989 Japanese P/E ratio from 53.7 to 35.9, the authors estimate.

“Differences in accounting practices between Japan and the United States make reported price/earnings (P/E) ratios for Japanese firms systematically higher than those for their U.S. counterparts.”

The importance of corporate cross-holdings in Japan also biases standard measures of the size of the U.S. and Japanese stock markets. Reciprocal holdings inflate the value of the Japanese stock market relative to the value of underlying corporate assets. Standard calculations suggest that Japanese equities comprised 40 percent of the world equity market at the end of 1989, compared with 31 percent for the U.S. markets. After correcting the market values of each nation for intercorporate shareholdings, however, French and Poterba conclude that Japan's share of world equity value was only 25 percent, compared with 38 percent for the United States.

The second major accounting difference between the two nations is in depreciation practices. Japanese firms use the same accelerated depreciation schedules to prepare financial statements and to compute taxable income. In contrast, U.S. financial statements use slower depreciation rates than U.S. corporate tax returns and slower rates than in Japan. For growing firms, the Japanese practice reduces reported earnings relative to what they would be under the slower depreciation schedules used for U.S. financial reporting. Given the actual investment history of Japanese firms, differences in depreciation rules can explain a further reduction in the P/E ratios from 35.9 to 23.8. Other, less substantial, accounting

factors would bring the Japanese multiple down to 22.9.

Although these accounting corrections yield Japanese P/E ratios that are much closer to their U.S. counterparts than the unadjusted data suggest, they cannot explain the full disparity between average P/E ratios in the two nations. The authors note that such differences could be caused either by higher expected growth rates for Japanese earnings than for U.S. earnings, or by lower required returns in the Japanese than in the U.S. equity market. The first explanation is not very promising, however. Although growth expectations historically have been higher in Japan than in the United States, there is no evidence for such a shift in expectations during the mid-1980s when Japanese P/E ratios soared. This suggests the potential importance of differences in the required return demanded by investors in the two equity markets.

French and Poterba show that when P/E ratios are high, small differences in required returns can result in large changes in stock prices. Thus relatively small changes in the required returns of Japanese investors could explain the Tokyo stock price run-up of the 1980s. However, French and Poterba do not find other evidence of such changes in required returns. Part of the increase in Japanese share prices by the end of 1989 remains a puzzle.

Finally, commenting on the 30 percent decline in Japanese share prices between January and August 1990, French and Poterba note that this is likely to bring the adjusted P/E for Japan much closer to the current level in the United States.

Does '86 Tax Reform Discourage Marriages?

Both economic and demographic variables—including wealth, potential wages, age, and race—affect a young person's decision to leave home and form a household. When government policies change the underlying economic variables, the decision to live independently also may change. For example, the Tax Reform Act of 1986 (TRA86) is estimated to have raised real rents on apartments and other housing by 10 to 20 percent. If this estimate is correct, then there are roughly 250,000 to 500,000 fewer households headed by people in their twenties than would have existed otherwise, according to a recent NBER study.

In Real Rents and Household Formation: The Effect of the 1986 Tax Reform Act (*NBER Working Paper*

No. 3309), NBER Research Associate **Patric Hendershott, Donald Haurin, and Dongwook Kim** study household formation in a sample of 2355 youths aged 22-29 in 1987. They find that rents that are high relative to earnings discourage young people from setting up their own households. Hendershott and his coauthors estimate that if rental costs rise 20 percent, there will be a 10 percent increase in youths living with their parents and a 5 percent reduction in newly married couples.

The authors note that TRA86 lengthened tax depreciation lives of rental property, raised capital gains rates, treated construction period interest and tax expenses less generously, and tightened passive loss rules. As a result, TRA86 is estimated to raise real rents by 10 to 20 percent. There were 38.9 million youth in their twenties in 1986. The authors predict that the total reduction in households formed by this group will be as much as 2 percent, or nearly 500,000 households.

Hendershott, Haurin, and Kim also find that young

"The Tax Reform Act of 1986 (TRA86) is estimated to have raised real rents on apartments and other housing by 10 to 20 percent. If this estimate is correct, then there are roughly 250,000 to 500,000 fewer households headed by people in their twenties than would have existed otherwise."

people are more likely to leave home, or to get married, as they get older. Also, women are more likely to move out of their parents' house, or to get married, than men their age. Perhaps surprisingly, having attended college makes a young person less likely to leave home, abstracting from the possibility that college attendance increases potential wage. Having left, though, former college students are more likely to live with a group of people rather than alone.

NBER

The National Bureau of Economic Research is a private, non-profit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers are:

Chairman—George T. Conklin, Jr.

Vice Chairman—Paul W. McCracken

Treasurer—Charles A. Walworth

President and Chief Executive Officer—Martin Feldstein

Executive Director—Geoffrey Carliner

Director of Finance and Administration—Sam Parker

Contributions to the National Bureau are tax deductible. Inquiries concerning contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

The NBER Digest summarizes selected Working Papers recently produced as part of the Bureau's program of research.

Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision. The Digest is issued for similar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the Digest has been reviewed by the Board of Directors of the NBER. Preparation of the Digest is under the supervision of Donna Zerwitz. The article indicated by DRF was prepared with the assistance of David R. Francis.

Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates. For all others, there is a charge of \$3.00 (\$4.00 outside of the U.S.) per paper requested. Advance payment is required on orders. Please do not send cash. For further information, please contact: Working Papers, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138; (617) 868-3900. Abstracts of all current National Bureau Working Papers appear in the NBER Reporter.