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Why the Buyout Boom Fizzled Out

Hundreds of publicly traded U.S. companies were taken private through leveraged buyouts (LBOs) during the 1980s. But after the value of leveraged transactions reached \$60 billion in 1988, the peak year for buyouts, there was a sharp decline to less than \$4 billion in 1990. Perhaps potential investors sensed something was amiss. Indeed, in an NBER study of 124 leveraged deals between 1980 and 1989, **Steven Kaplan** and **Jeremy Stein** find that companies that went through leveraged buyouts in the latter part of the 1980s have failed to meet debt payments at a far higher rate than companies involved in buyouts in earlier years.

In **The Evolution of Buyout Pricing and Financial Structure** (*NBER Working Paper No. 3695*), Kaplan and Stein find that, while in 1985 buyers paid shareholders an average of 26 percent above the previous stock price, that premium nearly doubled by 1988, a sign that the buyout market may have been "overheating." At the same time, the riskiness of buyout companies, if anything, increased.

As risk increased, so did debt burdens. From 1980 through 1983, nearly half the companies involved in buyouts raised at least 10 percent of their capital through an issue of common stock. In 1987, by contrast, half the companies taken private issued common stock for less than 4 percent of their capital, and raised a correspondingly greater share of their financing in the debt markets. These debt burdens became onerous by mid-decade, when buyout deals commonly required that large amounts of takeover debt be repaid within two years.

During the years of peak LBO activity, 1986 through 1988, the financial projections for most buyouts assumed that the company's earnings would not be adequate to service its debts, and that asset sales would be necessary in order to make debt payments. During those same years, however, debt service requirements became far less flexible as bank debt receded in importance while high-yield bonds took on a greater role. This made it more difficult for companies to restructure their debts if anticipated asset sales did not materialize. All of those developments made default more likely for later LBOs than for those occurring in the early 1980s.

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As prices and capital structures changed, so did management incentives. Kaplan and Stein find that, while the share of post-buyout equity held by firm managers was fairly consistent through the decade, executives in post-1984 buyouts earned far more from selling their shares in the prior, publicly held company than managers in earlier buyouts. This great opportunity to "cash out" may have given the

managers a greater incentive to go along with buyouts that were badly structured or simply overpriced.

Bankers and investment bankers may have had similar incentives. Starting in 1985, investors and lenders began taking a much larger proportion of their compensation in up-front fees that did not depend upon the venture's ultimate success, weakening their interest in making sure that deals were structured soundly. "The initial success of early buyouts generated increased competition for later transactions with the resulting prices and more poorly structured deals. Our results strongly suggest that, in aggregate, investors should have expected lower returns in later deals," Kaplan and Stein conclude.

The authors examine buyouts in which the transaction value exceeded \$100 million, the firm became an independent entity, and at least one member of the previous management held equity in the new private company. The total value of the buyouts in their sample is \$132 billion, accounting for over three-quarters of the value of all private buyouts during the decade. ML

Productivity in the Transportation Sector

Since 1973, productivity growth has slowed in many sectors of the U.S. economy. Until they were revised recently, official estimates showed that the growth of multifactor productivity (MFP) in the transportation sector declined sharply: from 2.4 percent per year in 1948-73 to -0.1 percent per year in 1973-87. (MFP is the ratio of output to the three major inputs—labor, capital, and fuel—and generally is interpreted as measuring the efficiency of resource use in the economy.) The quoted figures indicate that efficiency in transportation actually declined after 1973, in sharp contrast to the widespread claims that deregulation in the transportation sector spurred efficiency. These figures also are part of the much-discussed productivity slowdown in the service sector that is widely viewed as undermining the recent and future growth of the American standard of living.

NBER Research Associate **Robert Gordon** has developed new data and concepts that indicate that the annual growth rate of MFP in the transportation sector after 1973 actually was 1.9 percent per year, not the -0.1 percent previously estimated by the government statisticians. Gordon's estimates of the pre-1973 growth rate of MFP at 2.4 percent are the same as the government's.

In **Productivity in the Transportation Sector** (NBER Working Paper No. 3815), Gordon provides a separate analysis of postwar MFP growth in railroads, trucking, and airlines. He finds that, after deregulation began in the late 1970s, productivity growth rose greatly for railroads, but fell significantly for airlines and trucking.

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Deregulation allowed railroads to abandon unprofitable track, to merge with other companies, and to reduce featherbedding. As a result, the number of carriers fell from 65 in 1977 to 15 in 1988. Inputs of labor, capital, and fuel also fell sharply. Gordon calculates that MFP in railroads rose 4.5 percent during 1979-87. By contrast, he estimates, railroad MFP rose by 2.3 percent annually during 1969-78, and by 3.3 percent annually during 1948-69.

Gordon notes that the improvement in productivity represented trends that had started in the 1940s. "By the late 1980s railroads carried one-third more freight traffic than in the late 1940s with only one-sixth as many workers and much less capital and fuel input," he writes.

For the trucking industry, deregulation resulted in a shift from less-than-truckload general freight carriers to truckload firms. These firms use nonunion driver teams and relays on high-density traffic corridors, and thus have high vehicle use, low costs, and higher productivity. But the effect of this shift was offset by the decline in average highway speed caused by the 55-mile-per-hour speed limits set during the 1974 oil crisis. The net result was an actual increase in MFP in trucking of about 0.9 percent during 1978-87. This compares with an annual increase of about 1.9 percent during 1948-78, largely caused by improvements in the efficiency and durability of diesel engines during that earlier period.

Finally, Gordon finds that, in spite of deregulation, annual total factor productivity growth in the airline industry declined to 1.3 percent during 1978-87 from 3.3 percent in 1948-78. He notes that there have been minor increases in capacity utilization and in airplane size since deregulation. But both of these developments are dwarfed by the growth in airplane size and the shift to jets prior to 1970.

Gordon also examines recent changes in the quality of airline service. He finds that the spread of hub-and-spoke routing systems has decreased inter-airline connections, allowed passengers to use airports closer to their homes, and added more non-stop flights to small nonhub cities, while causing

only a negligible drop in the number of nonstop flights between large nonhub cities. On balance, deregulation has not lengthened passenger trips in time duration. Gordon therefore concludes that "hubbing" has not decreased the quality of airline service.

Technology May Explain Increasing Wage Dispersion

Inequality in wages earned by U.S. manufacturing workers, even among workers of equal experience and education and of the same gender, has increased dramatically and continuously since the late 1960s. According to an NBER study by **Steve Davis** and **John Haltiwanger**, over half of the overall wage dispersion in U.S. manufacturing can be explained by wage dispersion *between* plants. Moreover, wage dispersion between plants accounts for 48 percent of the growth of wage dispersion in manufacturing.

In **Wage Dispersion Between and Within U.S. Manufacturing Plants, 1963-86** (*NBER Working Paper No. 3722*), Davis and Haltiwanger report that between-plant dispersion accounted for most of the overall wage dispersion for production workers. More than 90 percent of the increase in wage dispersion among production workers between 1975 and 1986 also was attributable to differences between plants. For nonproduction workers, on the other hand, dispersion *within* the plant accounted for most of their overall wage dispersion, and for most of the increase in dispersion over that same time.

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What factors cause the dispersion of wages between plants? Most of the dispersion at a point in time, and most of the increase in dispersion over time, can be explained by differences in plant characteristics. These include plant size, age, region, type of ownership, and cost of energy. Of these factors, the most important is plant size, Davis and Haltiwanger find. Workers in large plants always have earned more, on average, than those in small plants. But the "plant size differential" has increased. In 1963, production workers in plants with 5000 or more employees earned \$3.53 (in 1982 dollars) an hour more than their counterparts in plants with only 20

to 49 workers. By 1986, this differential had risen to \$6.31, or 69 percent of the average paid to production workers.

Based on their study of over 900,000 manufacturing plants, the authors suggest that technical change in manufacturing, which increases the demand for skilled workers, could be the major reason for the increasing wage inequality in the United States.

DRH

Forecasting Foreign Exchange Rates

Banks, multinationals, and anyone else who participates in international currency markets could use more accurate forecasts of foreign exchange rates. Yet predictions in this area have been notoriously bad. It often has been found that investors would do better to ignore current forecasts. Instead, they could view the exchange rate as an unpredictable random walk, just as likely to rise as to fall.

Now a new study by NBER Research Associate **Jeffrey Frankel** and **Menzie Chinn** finds that professional forecasts, under certain conditions, can help to predict changes in exchange rates.

Frankel and Chinn examine the monthly predictions from an average of about 45 forecasters regarding the currencies of 25 developed and developing countries between February 1988 and February 1991. The data come from *Currency Forecasters' Digest*. Frankel and Chinn also examine monthly predictions for these currencies based on the value of their exchange rates in forward markets, where participants promise to exchange currencies in the future at a specified price.

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In **Are Exchange Rate Expectations Biased? Tests for a Cross Section of 25 Currencies** (*NBER Working Paper No. 3807*), Frankel and Chinn report that the prediction based on forward markets is wrong more often than not. Both the three-month-ahead predictions and the 12-month-ahead predictions of exchange rate shifts have the wrong sign more than half the time. The average of the professional forecasters when they look either three or 12 months ahead across the 25 currencies, on the other hand, is right more than half the time.

Recent NBER Books

Two New Volumes from University of Chicago Press

Politics and Economics in the Eighties, edited by Alberto Alesina and Geoffrey Carliner, is available now from the University of Chicago Press. The cloth-bound version is \$45.00; the paperback is \$17.95.

This volume, developed from a May 1990 conference, asks what political factors led to the changes in economic policies during the 1980s. The papers were written by political scientists and discussed by economists. Among the topics explored are voting patterns, the budget deficit, monetary policy, welfare spending, tax reform, international trade policy, minimum wage legislation, and the thrift crisis.

Alesina is an NBER faculty research fellow and an assistant professor of economics and government at Harvard University. Carliner is executive director of the NBER.

Economic Challenges in Higher Education, by Charles T. Clotfelter, Ronald G. Ehrenberg, Mal-

colm Getz, and John J. Siegfried, also is available now for \$39.95. This book offers an accessible analysis of three crucial economic issues: the growth and composition of undergraduate enrollments; the supply of faculty in the academic labor market; and the cost of operating colleges and universities.

Clotfelter is an NBER research associate and professor of public policy studies and economics at Duke University. He also is a former vice chancellor of that institution. Ehrenberg is an NBER research associate and a professor of economics and industrial relations at Cornell University. Getz is an associate professor of economics and associate provost for information science and technology at Vanderbilt University. Siegfried is a professor of economics at Vanderbilt University.

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