

Trends in Aggregate Concentration in the United States

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Back in 1976, a writer for *New York* magazine considered the wave of corporate mergers and takeovers then taking place and the implication that an increasing share of economic activity was occurring inside fewer corporations and penned a tongue-in-cheek essay titled “March 3, 1998: The Day They Couldn’t Fill the ‘Fortune’ 500” (Tobias, 1976). Little did he know that in the mid-1970s, he had not yet seen the large merger wave of the 1980s and the tsunami merger wave of the late 1990s. The annual total value of large mergers hovered under \$100 billion per year through the 1960s and 1970s, according to the two main sources of data in this area, *Mergerstat Review* and *Mergers & Acquisitions* magazine. During the merger wave of the 1980s, the total value of mergers exceeded \$200 billion per year for a few years in the late 1980s and early 1990s. But from 1998 to 2000, the annual value of large mergers was well over \$1 trillion per year, involving from 8,000 to 10,000 separate deals each year.¹ Even when the annual number or value of these large mergers is adjusted by measures that reflect the larger size of the U.S. economy, the merger wave of the late 1990s looms large in historical perspective.

However, the mergers of the 1980s and 1990s have not yet pressured *Fortune* magazine to trim back on the number of companies in its famous annual list. Indeed, *Fortune* had no trouble in 2001 finding 1,000 large companies to fill out its list that ranked the largest companies across all sectors of the U.S. economy for 2000 by sales

¹ For recent discussions of the merger waves and the data, see Golbe and White (1988, 1993), Black (2000), Holmstrom and Kaplan (2001), White (2001) and Pryor (2002).

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revenue.² The 1,000th company was the Amica Mutual Insurance Company, with revenues in 2000 of \$1.2 billion, \$3.0 billion in assets, and 3,316 employees. The largest company by revenue size was Exxon Mobil, with \$210.4 billion in revenue. The largest company by assets was Citigroup, which had \$902.2 billion in assets.

U.S. merger activity declined in 2001 and is likely in 2002 to remain below the crests of 1998 to 2000. But whenever the U.S. economy experiences major waves of large mergers, as it clearly did in the 1980s and 1990s, it is natural to wonder about the structural consequences. Has the wave of mergers in recent decades significantly changed the size distribution of large firms? Are the largest firms in the economy growing relative to the overall size of the economy? This article will address these questions, employing two rarely used data sets for the 1980s and 1990s.

As a shorthand, the share of some national economic aggregate that is accounted for by the largest X firms in the economy is frequently described as a measure of “aggregate concentration.” Thus, this article will be about aggregate concentration in the United States in the 1980s and 1990s. To preview my findings, the data show clearly and strongly that—despite the recent waves of mergers—aggregate concentration declined during the 1980s and early 1990s and then generally increased after the mid-1990s, but the levels at the end of that decade remained at or below the levels of the late 1980s or early 1990s and well below the levels of the early 1980s. However, average firm size increased steadily from 1988 onward, as did the relative importance of the larger size classes of firms (even though the shares of the giants have not increased), and the size distribution of firms became slightly more skewed toward larger firms. I will document these patterns and offer some tentative hypotheses to explain them.

Why Measure Aggregate Concentration?

Concerns about the economic, political and social power that might be a consequence of the presence and growth of large companies have a long history in U.S. political discourse. They extend back at least to the populist movement of the late nineteenth century and arguably back even to Thomas Jefferson’s support for and concerns about yeomen farmers or earlier to the constitutional requirement that each state, large or small, have two senators.

One manifestation of the populist concern about the economic power of large companies was the 1887 passage of the Interstate Commerce Act and its restrictions

² To be fair, Tobias (1976) did not quite predict, even with tongue in cheek, that there would be fewer than 500 firms in total in the U.S. economy in 1998. “There *were* more than 479 companies in the world [in 1997]. . . . There were still tens of thousands of firms that ranged from one-man shops up to what once would have been considered a fairly good-sized company. But the gap between these and the 479 giants was enormous. It would have looked silly to put even a company with \$248 million in assets on the list, when the next largest . . .—number 479—had assets of nearly \$7 billion.”

on the pricing and activities of railroads. Another was the U.S. antitrust laws, notably the Sherman Act of 1890, the Clayton Act of 1914 and the Federal Trade Commission Act of 1914. A state-level manifestation of the populist concern about the wider social/political influence and power of large and growing companies was the universal prohibition by the states in the nineteenth century on interstate branching by banks and the limitations by most states on intrastate banking. Many states, especially those that were heavily agricultural, limited their banks to a single location (“unit banking”). The intent clearly was that banks should be kept small and locally focused (White, 1993, 1995).

The populist concern about the growth of large corporations and the concomitant decrease in the relative importance of small enterprises finally found its broad national expression in the New Deal legislation of the 1930s, following the stock market crash of 1929–1933 and the onset of the Great Depression. The manifestations were primarily in measures to aid and preserve small enterprises. The National Industrial Recovery Act of 1933 had this intent, with the National Recovery Administration (NRA) subsequently permitting nearly a thousand industry groups to develop “codes of fair competition” that were intended to discourage price cutting and other aggressive behaviors so that smaller enterprises could survive alongside larger ones. The Robinson-Patman Act of 1936 amended the Clayton Act to strengthen its prohibitions on price discrimination, with the intention of helping small businesses, especially small retailers, by preventing their larger rivals from receiving lower prices from suppliers. The Miller-Tydings Resale Price Maintenance Act of 1937, which permitted the states to authorize resale price maintenance (“fair trade”), was championed by small retailers (especially pharmacists) that wished to limit the price cutting of their larger (chain-store) rivals (Marvel and McCafferty, 1986). Even the Agricultural Adjustment Acts of 1933 and 1936 had the preservation of small (“family”) farms as a major goal.

After World War II, the Eisenhower administration in 1953 established the Small Business Administration, as an agency to aid and to encourage small businesses and various legislative acts, such as authorizations for Defense Department procurement, included “set-asides” for small businesses. Periodic legislative acts to support U.S. agriculture have had the continued goal of supporting the (small) family farm.

Though the recent manifestations have primarily focused on concerns about small businesses, a populist concern about large companies has also been present. In the late 1970s, for example, as political concerns about a new wave of mergers heightened, legislation that would have limited mergers by large firms was seriously considered by the Congress before being dropped. In the Riegle-Neale Interstate Branching Act of 1994, which finally provided federal endorsement for interstate branching, there nevertheless were (and still are) ceilings on the fraction of a state’s bank deposits for which any single bank could account. Frequent references in the media to “big business” and “corporate America” are also indications of a continuing unease about the role of large corporations in the U.S. economy.

Even aside from any populist feelings that might trigger concerns about large

companies, it seems clear that the feel and fabric of an economy where, say, only 100 companies—or even 1,000—accounted for all or virtually all of private sector economic activity would be quite different from one in which economic activity was substantially more dispersed. These differences need not be the consequence of the exercise of market power by the large companies in individual markets. After all, if all 100 of these companies had roughly equal presences in all relevant markets, the measured levels of seller concentrations in those markets would easily satisfy the standard measurements of market concentration that imply perfect or near-perfect competition.³ Nevertheless, with, say, only 100 companies accounting for virtually all of private sector GDP, the average number of employees per company would be over one million, and the average value added per company would be \$80 billion. The landscape for employment opportunities or for the funding of new ideas, for example, would be quite different from that found in a less concentrated economy. Even if there were 1,000 economy-wide companies and the per-company magnitudes were only a tenth as large as just mentioned, we would still be describing a very different landscape than (as we will demonstrate) is present in today's U.S. economy.

Further, even if one were unsure whether aggregate concentration could be a problem (and if so, at which levels), nevertheless, information about *changes* in aggregate concentration level could be useful. After all, if information about levels of aggregate concentration showed no change or a decrease in concentration, then even if one believed that aggregate concentration might pose a problem, at least the problem wouldn't be getting worse.

How to Measure Aggregate Concentration

If one is concerned about the relative share of *economic activity* of large companies, then surely the aggregated value added of the companies is the best all-around measure. Value added is unambiguously comparable across all firms, regardless of the nature of their business.

Some other candidate measures—employment, aggregate wages or payroll, or profits—are simply components (directly or indirectly) of value added. For example, employment can be viewed as an indirect component of value added, since it is employment multiplied by the compensation per worker that yields aggregate labor income, which is a direct component of value added. Although profits in theory are a direct component of value added, it should be noted that accounting profits can be a shaky measure to use in comparing economic activity across firms

³ The huge number of multimarket contacts that this structure would imply might weaken substantially the competitive behavior that the individual market seller concentrations would otherwise imply. For discussions of the potential and actual influence of multimarket contacts, see Feinberg (1985), Rhoades and Heggstad (1985), Bernheim and Whinston (1990) and Evans and Kessides (1994).

or time periods. After all, a company's reported pretax profits can be affected by the vagaries of allowed depreciation and amortization rates—which can vary across firms depending on the types of assets in which they have invested—and its after-tax profits can be further affected by corporate tax rates, which again can vary across firms depending on tax brackets and any special provisions in the tax code. Also, the vagaries of the business cycle may have different effects on the profits of different types of firms, including different sizes.

Aggregate sales revenue of firms is often used as a way of measuring the absolute and relative sizes of enterprises. This method was popularized by its use as the criteria for specifying *Fortune* magazine's "Fortune 500." But the use of sales revenue presents obvious problems of double counting. For example, suppose a firm that both manufactures and distributes its products decides to spin off its distribution activities into a separate enterprise that buys only from its former affiliate. Where there was previously a single manufacturer-distributor that sold $\$X$ in goods per year (embodying $\$0.5X$ in value added), there are now two firms: a manufacturer that sells (say) $\$0.9X$ per year (with $\$0.4X$ in value added) and a distributor that buys the $\$0.9X$ and resells $\$X$ per year. It is far from clear why these latter two firms should each be considered the approximate equal of each other and why the distributor should be considered the larger of the two. Vertical mergers, of course, will reverse this process. Thus, retail firms with relatively thin value added margins would be overrepresented by a sales-based measure; "upstream" firms with greater value added relative to sales would be underrepresented.

Further, the "sales revenue" concept is not well defined for certain service industries. For example, should sales revenue include the securities sales of a brokerage firm on behalf of its customers? Should the concept include the firm's securities sales from its own portfolio? Both? Neither? In practice, neither category is reported as sales revenue. Instead, financial firms register as revenue their interest and fee income, plus any gains from their trading operations. This revenue concept seems appropriate for comparisons with a nonfinancial firm. But the employees of financial firms primarily think of the sizes of their companies in terms of assets—which brings us to another candidate measure.

At first glance, a firm's assets appear to be a plausible method to use in measures of aggregate concentration. After all, assets, like employment, would be an indirect component of a firm's value added; when multiplied by the profit rate on those assets, the firm's profits—a direct component of value added—would be obtained. However, as a practical matter, using firms' assets as the basis for an aggregate concentration measurement presents at least three substantial problems. First, if financial intermediaries, such as banks, insurance companies and mutual funds are included, there is substantial double counting, since the assets of these intermediaries largely consist of the liabilities of the enterprises to which they have lent or in which they have invested, with those liabilities in turn having been used to fund the assets of those enterprises.

Second, the presence of two alternative accounting treatments for mergers and

acquisitions can mean substantially different levels of assets that would appear on an acquiring company's balance sheet, solely because of the acquirer's choice of accounting treatment. In the "pooling" method of accounting, the assets of the acquired company are simply transferred to the acquiring company's balance sheet at their premerger balance sheet values, which would mean relatively lower post-merger asset values. In the "purchase" accounting method, an additional goodwill asset is created and entered on the acquiring company's balance sheet, to reflect the difference between the purchase price and the premerger net asset (balance sheet) value of the acquired company, which would mean relatively higher post-merger asset values. Thus, reported asset values could vary substantially, depending on which accounting treatment was chosen in otherwise identical mergers.

Third, changes over time in accounting and tax treatment of asset depreciation, amortization and write-offs, as well as changes in the expensing-versus-write-off treatment of various categories of costs, could arbitrarily affect reported asset values.

Two additional measurement issues should be mentioned. First, no conventional measure will completely encompass the indirect influences of some large franchise-oriented companies (like fast food restaurant chains or hotel chains), since the structural characteristics of the independent franchisee owners will not be directly included in the company data of the franchiser "parent" (except through royalties and other fees). Second, if the political economy concern that surrounds aggregate concentration is that of corporate influence and control, then the increasing institutionalization of the U.S. stock markets may point instead toward a focus on the few hundred large mutual fund companies and pension fund managers that dominate institutional holdings.

Notwithstanding these last comments, value added is clearly the superior all-around measure of relative economic importance for making comparisons across firms and thus for serving as the basis for measurements of aggregate concentration. Unfortunately, value added data are not widely collected on a systematic basis at the company level. However, society and the political process place a great deal of emphasis on employment—"jobs" and job creation and losses—as well as on wage income. Accordingly, a focus on the employment share and on the aggregate wages (payroll) share of large companies may well be an appropriate runner-up measure to value added.

Actual Measures of Aggregate Concentration

A variety of methods have been used over the years to measure aggregate concentration, some with notably imperfect data.⁴ Still, even with those imperfec-

⁴ Summaries of measurements of aggregate concentration for earlier periods can be found in Scherer (1970, 1980), White (1981), Golbe and White (1988) and Scherer and Ross (1990); see also Pryor (2001). Among the earliest efforts to measure aggregate concentration was that of Berle and Means

tions, what do the data indicate as to the levels and changes in aggregate concentration? In this section, I will present the most commonly used sources for measuring aggregate concentration in the past, as well as two sources of data previously unused for this purpose for the 1980s and 1990s.

The Census of Manufactures Value Added Measure of Manufacturing

The single exception to the rule that data on value added are not widely collected is the Census Bureau's *Census of Manufactures* report of the relative value added of the 50, 100, 150 and 200 largest manufacturing companies (against the base of all manufacturing enterprises). These data are available for the economic census years (plus a few additional years) beginning in 1947 and continuing through the most recently available census in 1997. Table 1 presents this measure of aggregate concentration. The data show a rise in manufacturing aggregate concentration between 1947 and 1954, a far more gradual rise for the next three decades and then a decline in the 1990s. By 1997, the manufacturing aggregate concentration levels were at the levels of 1963.

These data are the cleanest data available on aggregate concentration and the longest time series. But manufacturing, of course, has never constituted the entire private sector or even as much as a third of the private sector, and its relative importance has declined over these 50 years. In 1947, manufacturing constituted 30.8 percent of U.S. private sector GDP. It hit a postwar percentage high in 1955, at 33.1 percent, and has been declining (relatively) ever since. In 1999, the manufacturing sector constituted 20.5 percent of nongovernmental GDP. Consequently, these value added data for manufacturing, though correct in intent and concept, are sorely incomplete as an economy-wide measure of aggregate concentration.

The Federal Trade Commission Measure of Corporate Assets

The Federal Trade Commission compiled data for the assets of the 50, 100, 150 and 200 largest nonfinancial companies from 1958 to 1988. Table 2 presents these data, which indicate a modest decline in aggregate concentration between the late 1950s and the late 1970s and then a steeper decline in the 1980s. This series has been cited and described by Golbe and White (1988), Ginsburg (1986) and Yellen (1998).

These data embody all the drawbacks of attempting to use assets to measure aggregate concentration. Moreover, by excluding financial firms, they are necessarily incomplete, as well.

(1932), who measured the share of all nonfinancial firms' assets that were accounted for by the largest 200 companies, for the years 1909 through 1929. It is noteworthy that Berle and Means made their measurements shortly after the merger wave of the 1920s and that Scherer (1970) extensively reviewed the extant studies shortly after the merger wave of the 1960s.

Table 1

Aggregate Concentration in Manufacturing, as Measured by Value Added, 1947–1997

Year	Share of Total Value Added in Manufacturing Sector			
	Largest 50 Cos.	Largest 100 Cos.	Largest 150 Cos.	Largest 200 Cos.
1947	17%	23%	27%	30%
1954	23	30	34	37
1958	23	30	35	38
1962 ^a	24	32	36	35
1963	25	33	37	41
1966 ^a	25	33	38	42
1967	25	33	38	42
1970 ^a	24	33	38	43
1972	25	33	39	43
1976 ^a	24	33	39	44
1977	24	33	39	44
1982	25	33	39	43
1987	25	33	39	43
1992	24	32	38	42
1997	24	32	37	40

Note: Data are for economic census years.

^aDenotes years that draw on the Census Bureau's Annual Survey of Manufactures.

Source: U.S. Bureau of the Census, Census of Manufactures, various years; Survey of Manufactures, various years.

Fortune Magazine Data on Employment and Profits

The “Fortune 500” lists, first published in 1955 (covering firms’ 1954 data), were based on sales rankings and initially included only “industrial” companies—that is, manufacturing and mining companies. This restriction meant that large utilities (notably, AT&T), banks, insurance companies, railroads and airlines and service companies were initially excluded from the lists. However, the reach of *Fortune*’s 500 and supplementary lists was expanded sufficiently in the early 1970s so that economy-wide aggregate concentration measures of employment and profits could be compiled for the 1970s on a reasonably consistent year-to-year basis. Based on these data, Table 3 shows that during the 1970s, aggregate concentration—based on both employment and corporate profits—was relatively unchanged or may have declined modestly (White, 1981).

Unfortunately, even the expanded version of the *Fortune* data since the 1970s is subject to a number of drawbacks that preclude its use for time series comparisons. The after-tax profit data were subject to the vagaries noted above. More important, *Fortune* changed its coverage sufficiently in the early 1980s so that measurements for these years were not comparable with the measurements of the 1970s, and coverage and definitions continued to change during the 1990s, making time series comparisons problematic. Employment data appeared only sporadically.

Table 2

Aggregate Concentration in the Nonfinancial Private Sector, as Measured by Assets, 1958–1988

Year	Share of Total Assets of Nonfinancial Private Sector			
	Largest 50 Cos.	Largest 100 Cos.	Largest 150 Cos.	Largest 200 Cos.
1958	23.9%	31.6%	36.5%	40.0%
1963	24.2	31.3	36.3	39.9
1967	24.5	31.9	37.1	41.0
1972	23.2	30.5	35.7	39.7
1974	23.2	30.4	35.5	39.2
1975	23.3	30.6	35.6	39.5
1976	23.3	30.4	35.3	39.1
1977	22.7	29.7	34.5	38.3
1978	22.3	29.2	34.0	37.7
1979	21.9	28.9	33.7	37.4
1980	22.4	29.4	34.0	37.7
1981	22.2	28.8	33.3	36.9
1982	21.4	27.7	32.1	35.4
1983	21.0	27.3	31.6	34.9
1984	19.7	26.4	30.7	33.9
1985	19.3	25.8	29.1	32.8
1986	18.6	25.1	29.9	32.2
1987	18.6	25.1	29.1	32.1
1988	18.7	25.1	29.2	32.2

Source: Yellen (1998).

Also, the company data reported by *Fortune* cover only U.S.-based companies, but do include the non-U.S. operations of these companies. Accordingly, any aggregate concentration measure drawn from the *Fortune* data—the fraction of U.S. private sector employment (or profits) that was accounted for by the largest X companies—would involve a numerator that includes some non-U.S. employment (or profits). The problem of excluding non-U.S. firms that have U.S. operations has become a more serious issue in the 1980s and 1990s. For example, when Daimler absorbed Chrysler in 1998, Chrysler disappeared from the *Fortune* list, while Daimler-Chrysler (because it is not headquartered in the United States) did not replace Chrysler on the list. The same phenomenon occurred when BP absorbed Amoco in 1998. The generally increasing involvement of U.S.-based firms in the world market and of foreign-based firms in the U.S. market in recent decades has surely heightened these data problems. Accordingly, for all of these reasons, it is generally difficult to draw consistent time series conclusions about aggregate concentration in the U.S. economy from the *Fortune* data.

The Bureau of the Census Employment and Payroll Data

The Bureau of the Census has developed a publicly available annual series, “Statistics of U.S. Business,” that enumerates the numbers of firms, numbers of

Table 3

Aggregate Concentration in the Entire Private Sector, as Measured by Employment and by Profits, 1972–1980

Year	Share of Total Nonfarm Private Sector Employment			Share of Total Corporate Profits after Taxes		
	Largest 100 Cos.	Largest 200 Cos.	Largest 1,300 Cos.	Largest 100 Cos.	Largest 200 Cos.	Largest 1,300 Cos.
1972	18.2%	23.9%	37.3%	43.3%	55.4%	76.6%
1973	n.a.	n.a.	37.4	n.a.	n.a.	75.1
1974	n.a.	n.a.	37.0	n.a.	n.a.	72.6
1975	n.a.	n.a.	36.5	n.a.	n.a.	71.4
1976	n.a.	n.a.	36.1	n.a.	n.a.	73.8
1977	17.3	22.7	35.5	39.8	50.2	71.4
1978	n.a.	n.a.	34.7	n.a.	n.a.	70.4
1979	16.7	22.6	34.2	39.4	49.9	71.1
1980	16.6	22.1	34.0	44.9	56.5	75.6

Source: White (1981); Golbe and White (1986).

establishments, employment, payroll and sales receipts, drawn from company-level information on virtually all companies' U.S. operations. The data cover nearly all of the private sector economy. They are disaggregated into broad industry categories, using the major one-digit Standard Industrial Classification (SIC) codes through 1997 and the two-digit National American Industry Classification System (NAICS) codes beginning in 1998. The series currently covers the years 1988–1999. Most importantly for our purposes, the data are grouped into company size categories based on a company's number of employees. Thus, there are company (employee) size categories of 0–4, 5–9, 10–19, 20–99, 100–499 and 500-and-above employees. For some years, the size categories are finer. For instance, in 1992, 1998 and 1999, the economy-wide employee size categories also extend to 500–999, 1,000–1,499, 1,500–2,499, 2,500–4,999, 5,000–9,999 and 10,000-and-above employees.⁵

At this author's request, the Bureau of the Census compiled the data for the numbers of firms, employment and payroll from 1988 to 1999 into the complete range of employee size categories that extend to 10,000-and-above employees. In addition, the Bureau of the Census compiled the employment and payroll aggregates for the largest 100, 500 and 1,000 economy-wide companies, for each year.

These data are limited in various ways. They currently cover only twelve years. They encompass only employment and payroll, not value added. They exclude the

⁵ These data can be found at <http://www.census.gov/epcd/www/smallbus.html> and at <http://www.sba.gov/advo/stats/data/html>. The data are described at greater length in Armington (1998), Robb (1999, 2000) and Kwoka and White (2001).

Table 4

Economy-wide Numbers, Employment and Payrolls of Companies, 1988–1999

<i>Year</i>	<i>Aggregate Number of Companies (thousand)</i>	<i>Aggregate Employment (thousand)</i>	<i>Aggregate Payroll (billion)</i>	<i>Average Employment Per Company</i>	<i>Average Payroll Per Company (thousand)</i>
1988	4,955	87,844	\$1,859	17.7	\$375.2
1989	5,021	91,626	1,990	18.2	396.3
1990	5,073	93,469	2,104	18.4	414.7
1991	5,051	92,308	2,145	18.3	424.7
1992	5,095	92,828	2,272	18.2	445.9
1993	5,194	94,774	2,363	18.2	454.9
1994	5,277	96,722	2,488	18.3	471.5
1995	5,369	100,315	2,666	18.7	496.6
1996	5,478	102,187	2,849	18.7	520.1
1997	5,542	105,299	3,048	19.0	550.0
1998	5,579	108,118	3,309	19.4	593.1
1999	5,608	110,706	3,555	19.7	633.9

Source: U.S. Bureau of the Census, "Statistics of U.S. Business."

self-employed,⁶ farms, railroads, the U.S. Postal Service, households (for example, as employers of domestic workers) and large pension, health and welfare funds. They do, however, include nonprofit enterprises generally.

Despite these drawbacks, the data are more comprehensive than most other measures, they are consistent from year to year, and they exclude non-U.S. operations while including the U.S. operations of non-U.S. companies.⁷ Also, these data are the first-ever effort to use payroll information for measuring economy-wide aggregate concentration. These are large pluses in an area that is as plagued by poor data as is the study of aggregate concentration.

Table 4 shows the total number of companies, their total employment and payroll and their average employment and payroll size for 1988–1999. As can be seen, the total number of companies and their employment and payrolls grew over these eleven years. The average employment size of companies grew; their average payroll grew even faster (as would be expected in an era of rising wages).

Table 5 shows the economy-wide aggregate concentration measures of employment and of payroll for the largest 100, 500 and 1,000 U.S. companies for the years 1988–1999. For the employment measure (Panel A), aggregate concentration for

⁶ The Bureau of the Census describes the coverage as encompassing "employer firms." For 1998, the Census Bureau listed 5,579,177 "employer firms" that had 108,117,731 employees. It listed 15,708,727 "nonemployer firms." Many of these latter enterprises represent part-time efforts by individuals who have full-time employment elsewhere in an "employer firm," so the full-time equivalent employment of these "nonemployer firms" is substantially smaller than their aggregate number indicates.

⁷ This restriction limits non-U.S. companies' apparent importance. But short of compiling a global aggregate concentration measure, there is no satisfactory way of handling this issue.

Table 5
**Aggregate Concentration in the Entire Private Sector,
as Measured by Employment and Payroll, 1988–1999**

<i>Year</i>	<i>Largest 100 Cos.</i>	<i>Largest 500 Cos.</i>	<i>Largest 1,000 Cos.</i>
<i>Panel A: Share of Total Private Sector Employment</i>			
1988	11.3%	21.9%	27.1%
1989	11.1	21.5	26.6
1990	11.0	21.4	26.6
1991	11.1	21.6	26.8
1992	10.9	21.3	26.6
1993	10.7	20.8	26.1
1994	10.6	20.7	26.1
1995	10.5	20.7	26.1
1996	10.6	20.9	26.5
1997	10.9	21.2	26.7
1998	10.8	21.5	27.1
1999	11.2	21.8	27.4
<i>Panel B: Share of Total Private Sector Payroll</i>			
1988	13.8%	26.3%	32.4%
1989	13.6	25.6	31.2
1990	13.2	25.3	31.5
1991	13.2	25.4	31.6
1992	12.9	24.9	31.3
1993	12.0	24.1	30.5
1994	11.8	23.6	29.9
1995	11.7	23.6	29.8
1996	11.2	23.3	30.0
1997	11.4	23.4	30.0
1998	10.9	23.4	30.5
1999	11.5	23.9	31.1

Source: Special tabulation by the Bureau of the Census.

the largest 100, 500 and 1,000 companies clearly declined through 1995 and then rose, so that by 1999, their levels were approaching or were only slightly above those of the late 1980s. For the payroll measure (Panel B), the decline in aggregate concentration through the middle 1990s was more pronounced than was true for the employment measure. Despite some increases after 1995 or 1996, aggregate concentration levels in 1999 were lower than they had been in 1988 for the 100, 500 and 1,000 largest companies. Thus, economy-wide aggregate concentration levels for the largest 100, 500 and 1,000 companies, whether measured by employment or by payroll, declined from 1988 through the mid-1990s and then rose; but as of 1999, five of the six indicators were still below their 1988 levels and the sixth (the percentage of employment accounted for by the largest 1,000 companies) was only slightly above its 1988 level.

Another feature of the employment and payroll data is worth noting. Kwoka

and White (2001) found that the fraction of employment accounted for by “small firms” declined between 1988 and 1996. An update of their results shows that the share of total private sector employment at firms with fewer than 100 workers declined from 40 percent in 1988 to 36.2 percent by 1999. Similarly, the share of private sector employment at firms with fewer than 500 workers fell from 54.5 percent in 1988 to 50.3 percent in 1999. The decline is similar if measured by share of payroll. Since the smallest firms were losing their employment and payroll shares, while the largest 100, 500 and 1,000 companies were either losing employment and payroll shares or just keeping pace, the necessary implication is that the firms in between—firms that were larger than the smallest firms but smaller than the giants—were the net gainers.

Table 6 sheds further light on these size distribution questions.⁸ Panel A of Table 6 shows the aggregate numbers of companies in various employment size classes. Panel B shows their relative distribution. The relative *numbers* of companies in the smallest size class in the table (fewer than 19 employees) declined slightly, from 89.7 percent in 1988 to 89.3 percent in 1999; the larger size classes all grew slightly in relative numbers. Panel C shows that all three of the smallest size classes experienced declines in their shares of employment over the 1988–1999 period. The 500–999 employee size class was relatively stable over these years. The next largest size classes—1,000–4,999 employees and 5,000–9,999 employees—showed a modest rise through the period. The largest size class (above 10,000 employees) rose slightly through the mid-1990s and then experienced a sharper rise in the late 1990s. Panel D shows a similar pattern for payroll share, except that the payroll share of the 100–499 and 500–999 employee groups rose modestly, and the payroll share of the largest size group declined through the mid-1990s before rising to a level in 1999 that was higher than that of 1988.

To place this last set of results in perspective and in relation to the aggregate concentration results of Table 5, it is important first to remember that the aggregate concentration results of Table 5 refer to the fractions of employment and payroll accounted for by the largest *X number* of companies, whereas the results of Table 6 refer to the fractions of employment and payroll accounted for by the various (fixed) *size categories* of companies. Let us now imagine a growing economy with a fixed number of firms, where *all* firms grow at the same rate as the economy. For this hypothetical case, we would see aggregate concentration (the employment or payroll share of the largest *X* companies) remain stable, while the number of firms in and the employment and payroll shares of the largest size *category* would likely rise (as the largest firms from the next highest category “graduated” into the largest category), while the number of firms in and the employment and payroll shares of the smallest size category would shrink (as the largest firms in this smallest

⁸ Greater detail for the size distribution measures of Tables 6 and 7, as well as for the Gini coefficients discussed below, can be found in White (2001).

Table 6

Numbers and Percentage Distribution of Companies, Employment Percentages and Payroll Percentages, by Employment Size, 1988–1999

<i>Year</i>	<i>Total</i>	<i><19 Empl.</i>	<i>20–99 Empl.</i>	<i>100–499 Empl.</i>	<i>500–999 Empl.</i>	<i>1,000–4,999 Empl.</i>	<i>5,000–9,999 Empl.</i>	<i>10,000+ Empl.</i>
<i>Panel A: Number of Companies</i>								
1988	4,954,645	4,444,473	430,640	66,708	6,455	5,095	631	643
1989	5,021,315	4,493,875	443,959	69,608	6,926	5,605	678	664
1990	5,073,795	4,535,575	453,959	70,465	6,948	5,666	703	706
1991	5,051,025	4,528,899	439,811	68,338	6,842	5,727	709	699
1992	5,095,356	4,572,994	439,084	69,156	6,892	5,803	723	704
1993	5,193,642	4,661,601	445,900	71,512	7,185	5,995	726	723
1994	5,276,964	4,736,317	452,383	73,267	7,415	6,093	726	763
1995	5,369,068	4,807,533	469,869	76,222	7,566	6,334	768	776
1996	5,478,047	4,909,983	476,312	76,136	7,670	6,329	796	821
1997	5,541,918	4,958,641	487,491	79,707	7,972	6,464	818	825
1998	5,579,177	4,988,367	494,357	80,075	8,055	6,568	869	886
1999	5,607,743	5,007,809	501,848	81,347	8,235	6,698	871	936
<i>Panel B: Percentage Distribution of Companies</i>								
1988	100.0%	89.70%	8.69%	1.35%	0.130%	0.103%	0.013%	0.013%
1989	100.0	89.50	8.84	1.39	0.138	0.112	0.014	0.013
1990	100.0	89.39	8.94	1.39	0.137	0.112	0.014	0.014
1991	100.0	89.66	8.71	1.35	0.135	0.113	0.014	0.014
1992	100.0	89.75	8.62	1.36	0.135	0.114	0.014	0.014
1993	100.0	89.76	8.59	1.38	0.138	0.115	0.014	0.014
1994	100.0	89.75	8.57	1.39	0.141	0.115	0.014	0.014
1995	100.0	89.54	8.75	1.42	0.141	0.118	0.014	0.014
1996	100.0	89.63	8.69	1.39	0.140	0.116	0.015	0.015
1997	100.0	89.48	8.80	1.44	0.144	0.117	0.015	0.015
1998	100.0	89.41	8.86	1.44	0.144	0.118	0.016	0.016
1999	100.0	89.30	8.95	1.45	0.147	0.119	0.016	0.017
<i>Panel C: Percentage Distribution of Employment</i>								
1988	100.0%	20.85%	19.16%	14.53%	5.07%	11.55%	5.03%	23.81%
1989	100.0	20.33	18.94	14.60	5.22	12.16	5.18	23.58
1990	100.0	20.23	18.95	14.49	5.14	12.03	5.21	23.95
1991	100.0	20.27	18.58	14.24	5.11	12.36	5.34	24.11
1992	100.0	20.22	18.44	14.34	5.11	12.54	5.42	23.93
1993	100.0	20.12	18.38	14.59	5.23	12.75	5.33	23.60
1994	100.0	19.85	18.29	14.60	5.30	12.78	5.19	24.00
1995	100.0	19.51	18.36	14.61	5.21	12.85	5.35	24.10
1996	100.0	19.46	18.24	14.34	5.18	12.51	5.39	24.88
1997	100.0	19.11	18.15	14.55	5.22	12.43	5.41	25.15
1998	100.0	18.75	17.92	14.25	5.13	12.24	5.63	26.07
1999	100.0	18.42	17.80	14.13	5.11	12.23	5.48	26.84

Table 6—continued

Year	Total	<19 Empl.	20–99 Empl.	100–499 Empl.	500–999 Empl.	1,000–4,999 Empl.	5,000–9,999 Empl.	10,000+ Empl.
<i>Panel D: Percentage Distribution of Payroll</i>								
1988	100.0%	18.41%	16.99%	13.16%	4.83%	12.18%	5.88%	28.55%
1989	100.0	17.95	16.72	13.27	4.99	12.97	6.00	28.10
1990	100.0	17.84	16.75	13.28	4.90	12.71	6.12	28.40
1991	100.0	17.79	16.41	13.03	4.99	13.13	6.28	28.37
1992	100.0	17.59	16.24	13.12	5.02	13.58	6.43	28.01
1993	100.0	17.57	16.29	13.38	5.13	13.77	6.47	27.38
1994	100.0	17.40	16.40	13.49	5.18	13.86	6.23	27.45
1995	100.0	17.03	16.39	13.54	5.13	13.98	6.45	27.47
1996	100.0	16.89	16.33	13.48	5.13	13.64	6.53	28.01
1997	100.0	16.51	16.23	13.73	5.13	13.66	6.68	28.06
1998	100.0	16.17	16.05	13.49	5.04	13.25	6.72	29.29
1999	100.0	15.80	15.89	13.35	5.11	13.10	6.35	30.39

Source: Special tabulation by the Bureau of the Census.

category “graduated” into the next category).⁹ Average firm size would unambiguously grow.

Now let us imagine a growing economy with firms that remain fixed in size, where the rate of growth in the number of new firms equals the rate of growth in the economy and the employment and payroll distribution of new firms replicates the existing distribution. For this second hypothetical case, aggregate concentration of the largest X companies would fall, while the employment and payroll shares of each size category would remain constant. Average firm size would also remain constant.

The real U.S. economy of Tables 5 and 6 appears to be somewhat of an amalgam of these two hypothetical cases. The number of firms did grow, but at a substantially slower rate than the real growth of the overall private sector. (The overall number of firms grew by 13.2 percent between 1988 and 1999, whereas the real private (nonhousehold) sector grew by 43.6 percent.) The number of firms in every size category grew in absolute numbers, but the relative number of firms in the larger size categories increased, and the average size of firm increased. The employment and payroll shares of the smallest size categories declined, while the employment and payroll shares of the largest size categories increased. But aggregate concentration generally decreased.

A question still unaddressed by this discussion is whether the size distribution of companies may have become more skewed toward larger firms because of the relative growth of the medium-sized or almost-large firms. One way of investigating

⁹ The shares of intermediate size categories would vary depending on the size distribution of firms within each category.

this possibility is to compute Gini coefficients, which are a measure of the inequality of the distribution of a variable across a population. A Gini coefficient takes the value 0.0 if a variable is distributed equally across the population and 1.0 for complete inequality (where $n - 1$ members of the population have nothing, and the n th member has the entire amount).

In the present case, the Gini coefficients measure how the shares of employment and the shares of payroll are distributed across the population of different size companies.¹⁰ The calculations indicate a small but steady growth of Gini coefficients for both categories. The Gini coefficient for employment rose slowly but steadily from 0.8262 in 1988 to 0.8434 in 1999; for payroll, the Gini coefficient rose from 0.8391 in 1988 to 0.8590 in 1999. As a rough numerical equivalent, if there were only two size categories of companies and 91 percent of the firms accounted for 9 percent of employment while the remaining 9 percent of the firms accounted for the remaining 91 percent of employment, this would yield a Gini coefficient of 0.82. A Gini coefficient of 0.84 would be yielded by a similar 92 percent to 8 percent split between the two categories, and a Gini coefficient of 0.86 would be yielded by a 93 percent and 7 percent split. Thus, despite the decline or stability of the economy-wide aggregate concentration measures, there was a mild tendency for the firms in the larger size categories in the economy—though not the giants—to be growing relatively more important.

The Bureau of the Census data can also be arrayed by size of firm within the major sectors of the economy. Table 7 provides the numbers, employment shares and payroll shares of companies with 10,000-and-above employees for 1988 and 1997 (the last year for which the Census Bureau used the SIC system for organizing these data) for eight major sectors. These sectoral data are not additively comparable to the economy-wide data, because a company with 10,000-and-above economy-wide employees might show up in none, one or more than one of the sectors of Table 7, depending on that company's employee distribution across sectors. Nevertheless, the table provides a sense of the underlying trends within these sectors, at least through 1997. As can be seen, the within-sector employment shares of the 10,000-and-above companies fell in manufacturing and in transportation-

¹⁰ The Gini coefficient is the following ratio: the area between the Lorenz curve (which plots the cumulative fractional share of the variable against the cumulative fractional share of the population) and the diagonal (which represents perfect equality of distribution of the variable) divided by the area of the triangle beneath the diagonal (which is 0.5). For the size category data that are available from the "Statistics of U.S. Business," the Gini coefficient is calculated as follows:

$$G = \sum_{i=1}^{m-1} (F_i H_{i+1} - F_{i+1} H_i),$$

where F_i represents the cumulative population (i.e., company) share and H_i represents the cumulative employment (or payroll) share for size category i among the m ($= 11$) size categories.

Table 7

Aggregate Concentration within Major Industry Sectors, as Measured by Share of Private Sector Employment in Companies with More than 10,000 Employees, 1988 and 1997

Major Industry Sector	Number of Companies with More than 10,000 Employees		Percentage of Sector Employment in Companies with More than 10,000 Employees		Percentage of Sector Payroll in Companies with More than 10,000 Employees		Percentage of Private Sector Employment in Each Sector ^a	
	1988	1997	1988	1997	1988	1997	1988	1997
Mining	9	2	17.2%	n.a.	22.1%	n.a.	0.8%	0.6%
Construction	4	2	1.5	n.a.	1.9	n.a.	5.7	5.2
Manufacturing	210	195	31.4	25.7%	39.4	32.8%	21.9	17.7
Transportation, communications and utilities	65	63	41.3	39.9	49.7	46.3	6.0	5.9
Wholesale trade	21	27	6.8	7.7	9.5	8.7	6.8	6.5
Retail trade	124	167	28.1	33.7	27.4	33.1	21.5	20.9
Finance and real estate	78	89	24.8	32.4	27.6	35.0	7.6	7.0
Services	120	248	10.4	16.9	9.9	17.1	28.7	35.5

^aColumn totals do not add up to 100 percent because of an excluded "other" sector that had 0.9 percent and 0.7 percent of private sector employment in 1988 and 1997, respectively.

Source: Special tabulation by the Bureau of the Census.

communications-utilities.¹¹ They rose in the retail, wholesale, finance and real estate and services sectors. The same pattern held for payroll shares, except that they fell for wholesaling, as well. The changing relative employment weights for these sectors are provided in the two right-hand columns of the table. Manufacturing had the largest fall in its economy-wide employment weight, while services had the largest increase in its weight. Together, the changes in within-sector importance and the changes in across-sector weights provide a nuanced view of the countervailing forces that have influenced the relative importance of the very large enterprises with more than 10,000 employees in the U.S. economy in the late 1980s and the 1990s.

There is a final point—somewhat off the track of aggregate concentration measurements, but nevertheless noteworthy—that relates to the relationship between the employment data and the payroll data for the giants in Table 5. Traditionally, larger firms have paid their employees higher wages than has been

¹¹ They also fell in mining and construction through the mid-1990s, after which confidentiality restrictions prevented further data revelation.

the case for smaller firms. An amalgam of reasons have been offered to explain this pattern: greater tendencies of larger firms to be unionized; to employ employees with higher levels of human capital (partly as a consequence of the greater unionization); and to be more inclined to pay above-market “efficiency” wages so as to compensate for the decreased monitoring of individual employees that accompanies larger size. These higher relative wages by large companies can be seen in the comparisons of the aggregate concentration percentages in the early years of the data in Table 5: The giant firms’ share of payroll was larger than their share of employment. Over time, however, this differential narrowed considerably. A similar trend, though less dramatic, can be seen for the 10,000-and-above employees category in Tables 6 and 7.

Lower levels of and weaker unionization among larger firms was surely part of the explanation for this change. Whether changes in relative levels of human capital and of internal monitoring costs, for the giants as compared to smaller companies, also played roles in this reduced wage differential may be a topic for future research.

Forbes Data on Employment and Profits

Forbes magazine has been compiling “500” lists since 1958. The *Forbes* lists are similar to those of their better-known rival at *Fortune* magazine, but distinctive in certain ways. First, from the beginning, *Forbes* did not restrict itself to “industrial” companies, but covered the entire private sector. Second, *Forbes* has annually compiled four “500” lists—based on sales revenue, profits, assets and stock market value. In addition, from 1980 onward, *Forbes* has reported the aggregate employment of all of the companies that ranked in the top 500 on at least one of its lists. (This total number of companies varies from year to year, but is usually in the 770–820 range.) By contrast, the *Fortune* lists have not had consistently broad (economy-wide) inclusion criteria, nor have they had aggregate employment data consistently available for their largest companies for any extensive period.

The *Forbes* lists thus have the major advantages of broad coverage and year-to-year consistency in coverage. But they share with the *Fortune* lists the disadvantage of presenting consolidated company information, which means that the companies’ non-U.S. operations are included, and of excluding companies that are not headquartered in the U.S., even if—say, as in the case of Daimler-Chrysler—such firms have substantial U.S. operations.

For present purposes, the opportunity to use a data set with consistent coverage from 1980 through 2000 for the two major components of corporate value added—profits and employment—is too good to pass up. The other three series in the *Forbes* lists, however, are too flawed for computations of aggregate concentration. The drawbacks to using sales and assets were discussed above. The use of stock market value would restrict the universe over which aggregate concentration would be calculated to only the (approximately) 15,000 publicly traded companies and thus would miss much of what the social/political concern about aggregate concentration is all about.

In the first two columns of Table 8, we present the *Forbes* data on after-tax profits for the largest 500 U.S. companies (ranked by profits) in each year and on employment for all of the companies that entered the four *Forbes* lists in that year, along with the number of such companies. In the next two columns, we present the relevant national aggregates—total U.S. after-tax corporate profits¹² and private sector employment. The final two columns present the relevant aggregate concentration ratios. As measured by the profits of the largest 500 companies, aggregate concentration generally trended downward through 1998, and then rose;¹³ but the percentage values for 1999 and 2000 were well below the values of the early 1980s and were in the range of the early 1990s percentages. The employment percentages trended downward through 1995 and then rose;¹⁴ the percentage in 2000 was well below that of the early 1980s and was comparable to those of the late 1980s and early 1990s.

Thus, the aggregate concentration estimates drawn from the *Forbes* lists indicate that aggregate concentration declined from the early 1980s through the mid-1990s and a modest increase in the late 1990s brought aggregate concentration levels only back to where they were in the early 1990s and still well below the levels of the early 1980s.

¹²The IRS *Statistics of Income, Corporations* publications are the source of these data. The IRS data are compiled from corporate tax returns, which should make them reasonably comparable to the company-reported after-tax profits of the *Forbes* lists. An alternative source of after-tax corporate profits data, the national income accounts, also include inventory valuation and capital consumption adjustments. The IRS profits data, however, are currently available only through 1998. To estimate the 1999 and 2000 values, I regressed the IRS profits data (π_{IRS}) against the national income profits data (π_{NI}) for the years 1980–1998 and used that ordinary least squares equation and the national income profits figures for 1999 and 2000 to estimate the IRS profits figures. That estimating equation is as follows (*t*-statistics are in parentheses):

$$\Pi_{IRS} = -97.19 + 1.45\Pi_{NI} \\ (2.91) \quad (14.49) \quad R^2 = 0.93.$$

¹³ The 1982 ratio of greater than 100 percent is due to the IRS data's showing large numbers of companies with losses for that year, so that the aggregate (net) profits for all corporations were below the profits of the largest 500 (who were selected by *Forbes* to be those with the largest profits and thus none of whom had losses).

¹⁴ The varying number of companies from which the *Forbes* employment aggregate is calculated might seem to create an excessive margin for error for the employment calculations. However, the ending-year number of companies (817 companies in 2000) was virtually identical to the beginning-year number of companies (818 companies in 1980), which facilitates beginning and ending comparisons. Further, with the exception of the anomalous 895 companies in 1999, the number of companies for the remaining years all fell within the range of 774–818 companies. Though *Forbes* does not list the employment levels for each company, *Fortune* does list company employment for its list covering company rankings for 2000. The 45 companies that spanned *Fortune's* 774–818 rankings in 2000 (based on sales revenue) had a total employment of 448,000. This 448,000 constituted only 1.8 percent of the total employment of 24.9 million for the 817 *Forbes* companies shown in Table 8 for 2000. Thus, the modestly varying numbers of companies through the years were unlikely to have affected the clear trends shown in that table.

Table 8

Aggregate Concentration in the Entire Private Sector, as Measured by Corporate Profits and by Employment, 1980–2000

Year	Forbes Data		Private Sector Totals		Large Co. Shares of Totals	
	Profits of Largest 500 Cos. (\$ billion)	Employment (million); No. of Cos.	Corp. Profits (\$ billion)	Employment (million)	Profits	Employment
1980	\$119	22.6 (818)	\$167	74.2	71.3%	21.2%
1981	124	22.4 (798)	157	75.2	79.0	20.9
1982	112	21.6 (808)	109	73.7	102.8	20.5
1983	132	21.9 (808)	136	74.3	97.1	20.7
1984	140	21.2 (785)	171	78.4	81.9	19.2
1985	133	21.1 (798)	179	81.0	74.3	18.5
1986	141	20.6 (790)	198	82.7	71.2	17.8
1987	156	20.5 (796)	244	84.9	63.9	17.2
1988	167	19.9 (778)	321	87.8	52.0	16.2
1989	182	20.3 (783)	293	90.1	62.1	16.2
1990	171	20.6 (776)	275	91.1	62.2	16.1
1991	155	20.8 (790)	252	89.8	61.5	16.4
1992	179	20.4 (774)	300	90.0	59.7	16.0
1993	204	20.2 (785)	375	91.9	54.4	15.6
1994	250	20.2 (776)	441	95.0	56.7	15.2
1995	285	20.4 (787)	558	97.9	51.1	14.9
1996	325	20.9 (785)	635	100.2	51.2	15.0
1997	356	21.9 (779)	731	103.1	48.7	15.4
1998	364	22.9 (799)	909	106.0	40.0	15.7
1999	451	23.9 (895)	773 ^a	108.6	58.3	16.0
2000	496	24.9 (817)	870 ^a	111.1	57.0	16.3

^aEstimated; see text.Sources: *Forbes* magazine; IRS; BLS.**Conclusions and Hypotheses**

The major goal of this article has been to lay out the data on economy-wide aggregate concentration in the U.S., with a particular focus on the Bureau of the Census and *Forbes* data for the 1980s and 1990s. The results of these data are clear and strong: Aggregate concentration in the U.S. economy—the fraction of private sector economic activity accounted for by the largest 100, largest 500 and largest 1,000 companies—declined during the 1980s, declined further in the early 1990s and then rebounded somewhat in the late 1990s. These economy-wide results for the 1980s and 1990s are consistent with the other available evidence: from the long-term value added data from the Census of Manufactures; from the long-term Federal Trade Commission data describing the assets of nonfinancial corporations; and for analyses of the employment and profits data drawn from *Fortune* magazine for the 1970s.

However, although the giants of the economy have not expanded their shares of aggregate economic activity, the relative importance of the broader category of large companies has increased somewhat. This increase should be kept in context. Between 1988 and 1999, the total number of “employer firms” increased by over 13 percent, and the aggregate numbers of companies and of employment and payroll increased in all size categories. Thus, though small companies were declining somewhat in relative importance, they were far from an endangered species.

The rigorous testing of hypotheses to explain these patterns of aggregate concentration will have to await future research. Nevertheless, we can offer some tentative hypotheses that may help guide that research. We will focus primarily on addressing two questions. Why hasn’t aggregate concentration increased after years of vigorous merger and acquisition activity? Why are moderately large firms increasing in relative importance?

Why Hasn’t Merger Activity Increased Aggregate Concentration?

One approach to answering this question would focus on the advantages and disadvantages of firm size. Very large size may be a disadvantage: The “U”-shape average cost curve (rather than an “L” or even a continually downward-sloping curve) may be an accurate representation of the relative advantages and disadvantages of very large “horizontal” size. Further, the net advantages of much vertical integration may be overblown and economies of scope in most areas may be weak, although these factors will of course vary by industry, technology and even organizational specifics. CEOs who are empire minded or just excessively optimistic, and who are poorly restrained by weak corporate governance procedures, may try constantly to create giant firms through mergers and acquisitions, but economic reality eventually intrudes and forces shrinkage and spin-offs.

Another set of possibilities focuses on the notion that the reported levels of mergers and acquisitions may be misleading, because many of the transactions in these data don’t lead to greater corporate size or a higher level of aggregate concentration in the U.S. economy. About a third of the transactions that are included in the data on mergers and acquisitions are divestitures. Specifically, for 1991–2000, the ratio of divestitures to total mergers and acquisitions listed by *Mergers & Acquisitions* magazine was 35.4 percent; for *Mergerstat*, it was 29.7 percent. Unfortunately, no data are readily available to allow further investigation of divestitures, like the extent to which the divested firm becomes a stand-alone entity or part of a larger or smaller firm than its earlier parent.

Moreover, mergers may involve either U.S. companies’ purchases of non-U.S. companies or foreign companies’ purchases of U.S. firms. For 1991–2000, the ratio of transactions involving a U.S. company’s purchase of a non-U.S. company to total mergers and acquisitions listed by *Mergers & Acquisitions* magazine was 16.6 percent; for *Mergerstat*, the ratio was 14.6 percent. For the same years, the ratio of transactions involving a non-U.S. company purchasing a U.S. company to the total mergers and acquisitions listed by *Mergers & Acquisitions* magazine was 11.2 percent; for

Mergerstat, the ratio was 8.6 percent. (These percentages and the divestiture percentages are not exclusive of each other and contain some overlapping transactions.) The Bureau of the Census data will disregard mergers that involve foreign firms (unless they already have U.S. operations), since these data focus only on employment and payroll in the U.S. economy. The *Forbes* and *Fortune* data focus on employment and profits for U.S.-owned firms, even if these employment and profits happen in other countries. As a result, purchases of foreign companies by U.S. firms tend to increase measures of aggregate concentration derived from these data, while purchases of U.S. companies by foreign firms make the U.S. companies disappear from these data. In these situations, drawing an automatic connection that reported levels of mergers and acquisitions are necessarily increasing aggregate concentration in the U.S. economy can be quite misleading.

The Rising Relative Importance of Moderately Large Firms

Giant firms do not appear to be increasing their share of the U.S. economy, and the share of small firms appears to be declining somewhat. However, a group in the middle of moderately large but not giant firms appears to be gaining in share. Though the advantages of giant size may be overblown, there may nevertheless be advantages to being relatively large.

For example, in some industries, the importance of sunk costs, such as advertising and promotion, may be growing. Indeed, Kwoka and White (2001) argue, following Sutton (1991), that the rising importance of sunk costs may be endogenous—the result of the decisions of the leading firms in those industries. Further, the rising significance of exports for the U.S. economy has likely tended to increase firm size, since the development and maintenance of overseas markets also involves sunk costs and thus scale.

Improved technologies of managing and monitoring may have helped overcome the inherent difficulties of managing larger organizations (Williamson, 1967) and thus encouraged larger enterprises. However, this explanation would need to be calibrated to explain why this effect is seen for moderately large firms, but not for very large firms. One possibility is that these same technology improvements may also allow enterprises to monitor their partners in alliances and joint ventures better and thus reduce the firms' felt necessity to expand internally.

The changing weights of the major sectors of the economy—especially the expanding importance of services and the shrinking relative importance of manufacturing—as well as the changing importance of large firms within the sectors—especially the decreased importance of large firms within the manufacturing sector, but the rising importance of large firms in retailing, finance and services—may also have played a role.

Finally, the size distributions of mergers themselves may be a cause. The size distribution of firms that we have described could have arisen from a tendency for moderately large firms, but not the giants, to be the predominant acquirers.

Verification of this possibility would require a careful examination of the size distribution of acquirers and also of the sizes of their acquisitions.

A Few Final Words

The finding that aggregate concentration in the U.S. economy has not been generally increasing over recent decades, despite recent merger waves, may appear as somewhat of a surprise. Indeed, a final response to this paper might be to search for additional or improved data, in case the data provided here are misrepresenting the true trends in aggregate concentration. But while the existing data on aggregate concentration are imperfect in many ways, as discussed in the paper, it seems unlikely that new data will overturn the basic conclusions here, since there are no apparent biases in these data that would be pushing them to understate aggregate concentration to an increasing extent over time. While further research may refine these aggregate concentration measures, the primary focus should be to shed further light on the possible explanations for their pattern.

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