Are dividends disappearing? Dividend concentration and the consolidation of earnings [☆]

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Abstract

Aggregate real dividends paid by industrial firms increased over the past two decades even though, as Fama and French (J. Financial Econ. 60, 3) (2001a) document, the number of dividend payers decreased by over 50%. The reason is that (i) the reduction in payers occurs almost entirely among firms that paid very small dividends, and (ii) increased real dividends from the top payers swamp the modest dividend reduction from the loss of many small payers. These trends reflect high and increasing concentration in the supply of dividends which, in turn, reflects high and increasing earnings concentration. For example, the 25 firms that paid the largest dividends in 2000 account for a majority of the aggregate dividends and earnings of industrial firms. Industrial firms exhibit a two-tier structure in which a small number of firms with very high earnings collectively generates the majority of earnings and dominates the dividend supply, while the vast majority of firms has at best a modest collective impact on aggregate earnings and dividends.

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1. Introduction

In their intriguing study, "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?," Fama and French (2001a) document a large decline over 1978–1998 in the number and percent of nonfinancial and nonutility firms (hereafter, industrials) that pay dividends. Their analysis indicates that this dramatic change in dividend practices is due both to changes in the population of firms that are now publicly held (with many more public firms now exhibiting the characteristics of firms that historically have not paid dividends), and to a reduced propensity to pay dividends by firms whose characteristics historically would have led them to distribute cash to stockholders. Although Fama and French carefully state that their findings show a reduction in the number and percent of dividend-paying *firms*, their evidence is commonly interpreted as indicating that *dividends* themselves are disappearing.[1] The latter view seems more than plausible, given the striking fact that the number of dividend-paying industrials has declined by more than 1,000 firms (over 50%) over the last 20–25 years.

Although our evidence confirms a radical transformation in corporate dividend practices over the last two decades, it does not indicate that dividends are disappearing. Rather, dividends paid by industrial firms actually *increased* over 1978–2000, both in nominal and in real terms (by 224.6% and 22.7% respectively for our sample). Why did aggregate real dividends increase despite a 50%-plus decline in the number of payers? The answer is twofold: (i) the large reduction in payers occurred almost entirely among firms that paid very small dividends, with the loss of these firms' dividends having at best a minor impact on the aggregate supply, and (ii) dividends simultaneously increased substantially among the largest payers, reflecting a marked increase in their real earnings. In short, the increase in real dividends paid by firms at the top of the dividend distribution swamps the dividend reduction associated with the loss of many small payers at the bottom.

These secular changes reflect high and increasing dividend concentration. For example, the 25 largest dividend payers, all of which are "old line" established firms, collectively supplied over half (54.9%) of aggregate industrial dividends in 2000. Moreover, the earnings that underlie these high dividend payments are themselves highly concentrated. The total earnings of the 25 top dividend payers constitute 51.4% of aggregate industrial earnings in 2000 and, in real terms, are more than double their 1978 level. The dividends paid by these 25 firms in 2000 exceed their 1978 level by $9.2 billion in real terms ($24.3 billion in year 2000 dollars), an increase

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[1] For example, The New York Times and The Economist report that dividends have become less relevant and perhaps irrelevant, citing the findings of Fama and French (2001a) as well as low dividend yields and the popularity of stock repurchases ("Dividends Are Fading as Market Signals, Too," The New York Times, November 7, 1999, "Shares Without the Other Bit: In Corporate America, Paying Dividends Has Gone Out of Fashion," The Economist, November 20, 1999, and "Economics Focus: Dividends End," The Economist, January 20, 2002). Time cites low dividend yields and an increased incidence of dividend omissions by healthy electric utility firms as evidence that "dividends have become only slightly more relevant than the gushing palaver in an annual report" ("Disappearing Dividends? Ending Payouts May Be a Good Thing for Investors," Time, February 2, 1998).

that is greater than the $7.1 billion aggregate real increase for all industrial firms. (Here and throughout the paper, we compare dividends and earnings for 1978 and 2000 by converting 2000 dollars into 1978 dollars using the consumer price index.) This evidence shows that a relative handful of firms now both dominates the supply of dividends and generates the preponderance of earnings, and that both dividend and earnings concentration have increased substantially from the (already high) level of two decades ago.

Changes in the cross-sectional distribution of earnings—especially among firms at the top end of the distribution—are the fundamental reason why real dollar dividends paid by industrial firms have increased even though, as Fama and French (2001a) conclude, industrial firms now exhibit a reduced propensity to pay dividends (i.e., they are now more likely to pay zero dividends, controlling for earnings and growth opportunities). We find that 100% of the firms with at least $1 billion in real earnings paid dividends in 1978, whereas 85.7% paid dividends in 2000, consistent with Fama and French's reduced propensity to pay. However, although a smaller proportion of firms with high real earnings now pays dividends, top earners continue to exhibit a very strong tendency to do so. And since top-end firms now produce so much more in real earnings, on net this group shows a large increase in real dividends even though a few very large earners, primarily technology firms, have been slow to initiate dividends. The end result is that aggregate dividends paid by industrial firms increased over 1978–2000 despite the reduced propensity to pay dividends.

Overall, the supply of dividends by industrial firms exhibits a two-tier structure in which a small number of firms with very high earnings collectively generates the majority of earnings and dominates the dividend supply, while the vast majority of firms has at best a modest collective impact on aggregate earnings and dividends. We discuss the implications of the two-tier structure for the dividend clientele and signaling hypotheses and for the evolution of corporate payout practices in Section 7. Section 2 begins the paper by describing our sampling procedure, and it also details the aggregate dividend increase from 1978 to 2000 for industrial firms. Section 3 documents the concentration of dividends and the consolidation therein that has occurred over the last two decades, while Section 4 does the same for earnings. Section 5 identifies the top payers, the top nonpayers, and the firms with the highest earnings in 2000. Section 6 documents how many of the 1978 dividend payers continued to pay dividends in 2000, the strong influence of these continuing payers on the 2000 dividend supply, and what happened to the remaining firms (primarily, they were acquired).

2. Sampling procedure and aggregate dividends, 1978–2000

Shoven (1986, Table 2) reports that US government data show a near doubling of nominal dividends for the corporate sector as a whole over 1978–1985. And this trend continues, with aggregate nominal dividends increasing 647.2% over 1978–2000, nearly twice the contemporaneous 330.0% increase in GDP, and with aggregate real dividends increasing 182.9% (all data from Economic Report of the

President, 2001). These data paint a very different picture from the impression one forms from Fama and French's (2001a) finding that the number of dividend payers has fallen by more than 50% since 1978 (see footnote 1 above). Of course, the government population is not confined to publicly traded industrials, the sample that Fama and French study, since it also includes private firms and publicly held financials and utilities. However, as we show below, aggregate dividends also increased for publicly traded industrials, thereby posing the conundrum that we study in this paper: why have aggregate dividends increased in the face of a radical decline in the number of payers?

Following Fama and French (2001a), we sample CRSP industrial firms with SIC codes outside the ranges 4900–4949 and 6000–6999 (financials and utilities). We call nonfinancial and nonutility firms ''industrials,'' while recognizing that this group also includes service firms, conglomerates, and perhaps other companies not conventionally labeled industrials. Like Fama and French (2001a), we restrict attention to NYSE, AMEX, and NASDAQ firms with CRSP share codes 10 or 11 for at least one month of each year in question, and with nonmissing December share price and quantity data. We consider only CRSP firms with dividends and earnings on Compustat (the CRSP/Compustat sample). Our sample sizes differ slightly from those of Fama and French because we place different requirements on the availability of specific data items, and probably also because of differences in how we implement sampling criteria regarding the monthly observation of CRSP share and/or SIC codes. Fama and French examine trends over 1978–1998, while we employ data that became available after publication of their study and therefore examine trends over 1978–2000.

Table 1 shows that the large decline in the number of dividend payers from 1978 to 2000 is confined to industrial firms. While the number of dividend-paying industrials fell 58.8%, from 2,250 in 1978 to 926 in 2000, the number of payers among financial/utility firms increased by 9.5%, from 852 to 933. Although not shown in the table, the proportion of dividend-paying financials/utilities on CRSP fell from 79.9% to 71.6% over 1978–2000, a decline that occurred because the increase in listed firms proportionately exceeds the increase in these payers. Because the precipitous decline in the number of dividend-paying industrials is not matched by a similar decline for financials/utilities, it cannot simply reflect a general increase in managers' reluctance to pay dividends, but must instead relate to some underlying fundamental change(s) largely confined to industrial firms. For example, income tax law changes that had similar effects on nonindustrial and industrial firms' incentives to pay dividends cannot explain the secular trends in Table 1.

Fig. 1 tracks aggregate dividends, earnings, and losses for industrial firms on CRSP/Compustat over 1950–2000, as well as total earnings for the subset of dividend-paying industrial firms. The CRSP/Compustat population expands in 1962 (when CRSP added AMEX firms to its coverage of NYSE firms) and again in 1972 (when NASDAQ firms were added), but remains unchanged post-1978, when the number of payers fell by more than 50%. The figure shows that (i) aggregate dividends increased steadily over the full period 1950–2000, including the 1978–2000 subperiod, (ii) the long-term growth in aggregate dividends reflects the underlying

Table 1

Number of dividend-paying firms over 1978–2000: CRSP sample partitioned by industrial versus financial and utility firms

For each year, the table includes NYSE, NASDAQ, and AMEX firms on CRSP that have CRSP share codes 10 or 11 and that meet the other sampling criteria described in the paper. The sample of financial and utility firms includes those with SIC codes in the ranges 4900–4949 or 6000–6999, while the sample of industrial firms includes those with SIC codes outside these ranges.

Year	CRSP industrial firms	CRSP financial and utility firms	CRSP total	NYSE industrials	NASDAQ and AMEX industrials
1978	2,250	852	3,102	1,015	1,235
1979	2,160	841	3,001	1,004	1,156
1980	2,050	835	2,885	982	1,068
1981	1,936	815	2,751	951	985
1982	1,820	780	2,600	911	909
1983	1,712	784	2,496	870	842
1984	1,672	794	2,466	856	816
1985	1,562	817	2,379	815	747
1986	1,434	833	2,267	761	673
1987	1,363	979	2,342	709	654
1988	1,306	1,020	2,326	684	622
1989	1,271	1,015	2,286	663	608
1990	1,234	941	2,175	651	583
1991	1,177	863	2,040	642	535
1992	1,219	865	2,084	679	540
1993	1,218	959	2,177	691	527
1994	1,245	1,042	2,287	717	528
1995	1,265	1,103	2,368	745	520
1996	1,214	1,136	2,350	750	464
1997	1,170	1,110	2,280	744	426
1998	1,111	1,072	2,183	727	384
1999	1,038	1,022	2,060	699	339
2000	926	933	1,859	626	300
Absolute change over 1978–2000	−1,324	+81	−1,243	−389	−935
Percent change over 1978–2000	−58.8%	+9.5%	−40.1%	−38.3%	−75.7%

growth in earnings, although as expected, dividends grew more smoothly than earnings, (iii) dividend payers account for the vast bulk of industrial earnings in all years [as in Fama and French (2001a, p.18)], and (iv) aggregate losses increased markedly from 1978 to the early 1990s, reaching massive levels in the late 1990s. In the remainder of the paper, we compare aggregate industrial dividends for 1978 and 2000, since the former year marks the beginning of the long-term decline in the number of payers and the latter year has the latest available data. As Fig. 1 shows, there is nothing unusual about aggregate dividends in these two years. Rather, the increase from 1978 to 2000 is simply part of a steady long-run uptrend in aggregate dividends paid by industrial firms.
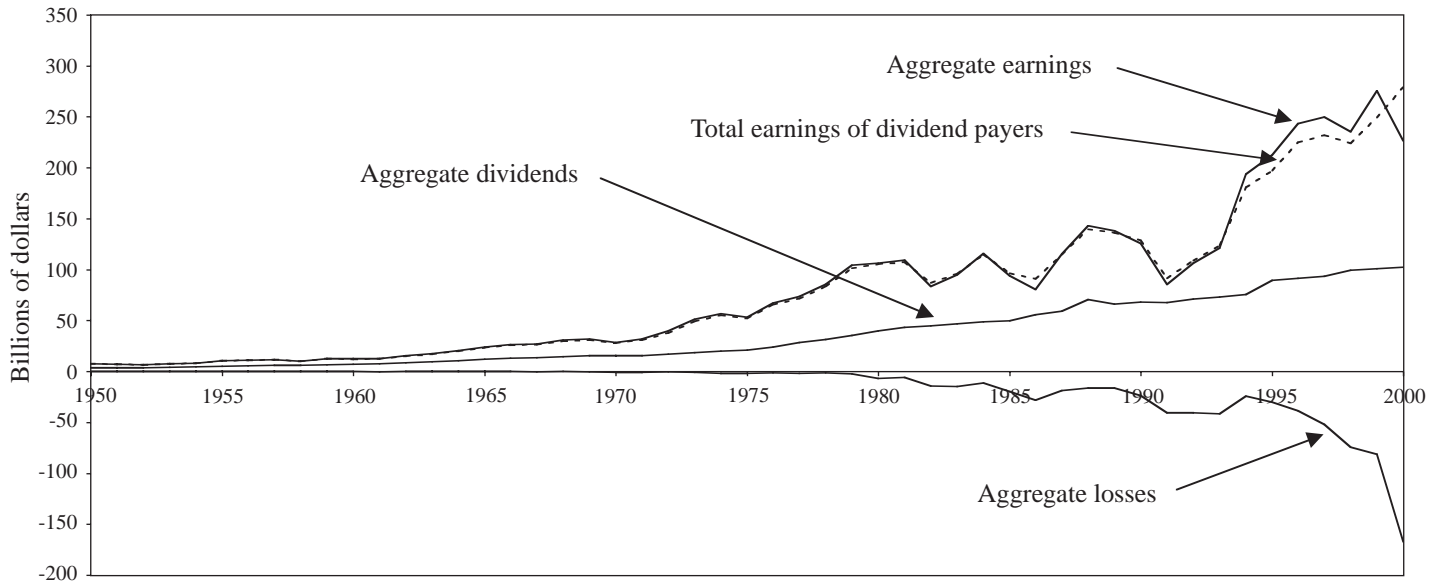
Fig. 1. Aggregate dividends, aggregate earnings, aggregate losses, and total earnings for dividend payers: Industrial firms on CRSP/Compustat, 1950–2000. The sample includes NYSE, NASDAQ, and AMEX firms on CRSP that have share codes 10 or 11. Industrial firms are defined as those with SIC codes outside the ranges 4900–4949 and 6000–6999 (financial and utility companies). The sample is restricted to firms for which Compustat has nonmissing dividends and earnings before extraordinary items (Compustat items 21 and 18) for the year in question. For each year, the data in this figure are based on Compustat's year assignment, whereas the data in all other tables are generated under the Fama and French (2001a, p. 40) convention of assigning financial data to years based on the calendar year in which the fiscal year-end falls. The alternative year-end conventions have little effect on the aggregate dollar magnitudes of the variables that we analyze. Total earnings for dividend payers are the sum of earnings for all firms that pay a positive dividend during the year in question.

Table 2

Aggregate dividends in 1978 and 2000 and related descriptive statistics: Industrial firms on CRSP/Compustat

The sample includes NYSE, NASDAQ, and AMEX firms on CRSP that have share codes 10 or 11, and SIC codes outside the ranges 4900–4949 and 6000–6999. The sample is restricted to firms for which Compustat reports dividends and earnings before extraordinary items (Compustat items 21 and 18) for each year in question. Real dividends in 2000 are nominal dividends converted to 1978 dollars using the consumer price index. The CRSP/Compustat sample assigns each firm to 1978 (or 2000) based on the date of its fiscal year-end, while the CRSP sample assigns a December 31 year-end for all firms. Since most firms have a December 31 year-end, the number of dividend-paying firms on CRSP/Compustat can exceed the number on CRSP (which is the case here for 2000 as a comparison of Tables 1 and 2 indicates).

	1978	2000	Absolute (%) change
1. Aggregate nominal dividends ($ billions)	$31.3 billion	$101.6 billion	$70.3 billion (+224.6%)
2. Aggregate real dividends ($ billions, 1978 base)	$31.3 billion	$38.4 billion	$7.1 billion (+22.7%)
3. Mean real dividend ($ millions, per dividend-paying firm)	$14.4 million	$41.4 million	$27.0 million (+187.5%)
4. Median real dividend ($ millions, per dividend-paying firm)	$1.4 million	$3.6 million	$2.2 million (+157.1%)
5. Number of dividend-paying industrials on CRSP/Compustat	2,176	930	−1,246 (−57.3%)
6. Percent of all CRSP/Compustat industrials that paid dividends	65.1%	19.4%	−45.7%
7. Percent of dividend-paying industrials that are NYSE-listed	45.0%	66.0%	+21.0%
8. Percent of total dollar dividends accounted for by NYSE-listed firms	94.7%	97.4%	+2.7%

Table 2 documents that aggregate nominal dividends increased by 224.6% for CRSP/Compustat industrial firms, from $31.3 billion in 1978 to $101.6 billion in 2000, while aggregate real dividends (here and throughout denominated in 1978 dollars) increased by 22.7%, to $38.4 billion.[2] The mean real dividend paid (per dividend-paying firm) increased from $14.4 million in 1978 to $41.4 million in 2000, while the median increased from $1.4 million to $3.6 million. The difference in mean and median—and the large expansion in that difference over 1978–2000—reflects substantial dividend concentration in 1978 and a large increase therein over 1978–2000, both of which we document in the next section. NYSE firms account for 66.0%

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[2] Fama and French's (2001a) approach of screening for firms with CRSP share codes 10 or 11 and matching with Compustat data offers protection against the possibility that changes in Compustat's coverage over time drive the results. For example, since Compustat has recently added many foreign firms with ADRs that pay large dividends, the aggregate dividend increase for the full Compustat population is misleadingly large. The aggregate dividend comparisons in Table 2 do not suffer from this problem, as they were generated using Fama and French's sampling approach. Nor are they substantively affected by the loss of CRSP firms with data unavailable on Compustat. Using CRSP dividend data for the latter firms, we find that the $7.1 billion real dividend increase from 1978 to 2000 (reported in Table 2) narrows by only $129 million, so that real dividends increased for the full set of CRSP firms.

of payers and 97.4% of aggregate dividends in 2000, up respectively from 45.0% and 94.7% in 1978. The fact that NYSE firms pay the overwhelming majority of industrial dividends likely reflects the tendencies for older and more stable (thus typically dividend-paying) firms to list their shares on the NYSE, and for young and growing (thus typically not dividend-paying) firms to trade on NASDAQ.

3. Dividend concentration and the increase therein over the last two decades

Table 3 ranks dividend-paying industrial firms by cash dividends paid in 1978 and 2000, in groups of 100 firms. For each ranked group in 1978 and 2000, the first two

Table 3
Concentration of total dollar dividends paid by industrial firms in 1978 and in 2000
Firms are ranked from the largest to smallest total dollar dividends paid in each year (per Compustat). The sample includes NYSE, NASDAQ, and AMEX firms on CRSP that have share codes 10 and 11 and SIC codes outside the ranges 4900–4949 and 6000–6999. A firm is included only if Compustat reports dividends and earnings before extraordinary items for the year in question (Compustat items 21 and 18). A firm's dividends are the amounts reported for the fiscal years ending in 1978 or 2000. For 2000, the row corresponding to firms ranked from 901 to 1000 has 30 firms because there are 930 dividend payers that meet our sampling criteria in 2000. Each cell amount is rounded to the nearest significant digit, which explains a few minor discrepancies across row or column total figures.

Dividend ranking	Percent of total dividends (%)		Cumulative % of total dividends (%)		Real dividends ($ millions, 1978 base)	
	1978	2000	1978	2000	1978	2000
Top 100	67.3	81.8	67.3	81.8	$21,111	$31,477
101–200	11.8	10.1	79.1	92.0	3,691	3,889
201–300	6.3	3.9	85.4	95.8	1,970	1,492
301–400	4.0	1.9	89.4	97.7	1,247	748
401–500	2.8	1.0	92.2	98.8	865	401
501–600	1.9	0.6	94.0	99.4	585	223
601–700	1.4	0.3	95.4	99.7	431	132
701–800	1.0	0.2	96.4	99.9	325	70
801–900	0.8	0.1	97.2	99.9	249	29
901–1000	0.6	<0.1	97.8	100.0	192	1
1001–1100	0.5		98.3		153	
1101–1200	0.4		98.7		120	
1201–1300	0.3		99.0		96	
1301–1400	0.2		99.3		76	
1401–1500	0.2		99.5		61	
1501–1600	0.2		99.6		49	
1601–1700	0.1		99.7		40	
1701–1800	0.1		99.8		31	
1801–1900	0.1		99.9		23	
1901–2000	0.1		99.9		16	
2001–2100	<0.1		99.9		10	
2100–2176	<0.1		100.0		2	
Total for all firms	100.0	100.0	100.0	100.0	$31,343	$38,461
Number of firms					2,176	930

columns report the percent of dividends paid, the middle two columns report the cumulative percent, and the last two columns report total real dividends. Overall, a relatively small number of firms pays the overwhelming majority of aggregate industrial dividends, and this concentration has increased substantially over the last two decades. For example, in 2000, the top 100 dividend payers distributed 81.8% of dividends, up from 67.3% in 1978. The $31.5 billion in real dividends paid by the top 100 dividend payers in 2000 ($83.2 billion in year 2000 dollars) exceeds the $31.3 billion paid in 1978 by *all* 2,176 dividend payers. For the top 100, dividends increased by $10.4 billion (49.1%), or more than triple the $3.3 billion dividend decline for all ranks below the top 100. Since virtually all of the increased dividend concentration is driven by the top 100 or 200 payers, this concentration increase is obviously not an artifact of the reduction in the number of payers.

Table 4 summarizes the cross-sectional distributions of dividends in 1978 and in 2000, with dividend-paying firms categorized by real dollar dividends paid, ranging from $500 million-plus per year to less than $1 million per year. The table documents that the number of firms paying dividends of $100 million-plus increased by 34 over 1978–2000, for a dividend increase of $12.6 billion. Over the same period, the number of firms paying less than $100 million decreased by 1,280 and this decline manifests primarily in the two smallest dividend classes, with the 1,069 net reduction in firms paying less than $5 million per year accounting for 85.8% of the overall net decline of 1,246 firms. And while the 1,069-firm reduction in small payers is large in *number*, the dollar magnitude of the $1.1 billion in dividends lost is dwarfed by the $12.6 billion in dividends gained from the 34-firm increase for the $100 million-plus category.

In sum, the top categories of dividend payers now contain more firms and these firms now pay substantially higher total dividends, while the bottom categories now contain many fewer firms and these firms now pay modestly lower total dividends. The net result is a large decrease in the number of payers accompanied by an increase in aggregate dividends, which reflects the fact that the top-end firms dominate, while the bottom-end firms have little impact on the aggregate dividend supply. Black and Scholes (1974) and Miller (1977) argue that what matters to investors is the aggregate supply of securities with particular characteristics (e.g., dividends, taxable interest returns, etc.), and not the number of firms delivering that supply or the quantity delivered by any one firm. In their view, the decline in the number of payers is of little consequence so long as sufficient dividends are supplied to meet the demand for dollars delivered currently in that form. Since aggregate real dividends increased over 1978–2000, the decrease in the number of payers was not caused by a reduction in aggregate demand, but instead must reflect changes in the factor(s) that determine firms' dividend supply decisions.

4. Dividend and earnings concentration and payout ratios

Lintner's (1956) finding that firms' dividend supply decisions primarily depend on earnings suggests that the high/increasing dividend concentration we observe may be the result of high/increasing earnings concentration. The evidence reported in this

Table 4

Number of firms and real dividend payments in 1978 and in 2000 for samples of industrial firms that paid given amounts of real dividends ($ millions, 1978 dollars)

The sample is comprised of NYSE, NASDAQ, and AMEX firms on CRSP with share codes 10 or 11 and SIC codes outside the intervals 4900–4949 and 6000–6999. A firm is included only if Compustat reports dividends and earnings before extraordinary items for the year in question (Compustat items 21 and 18). A firm's dividends are the amounts reported for the fiscal years ending in 1978 or 2000. Real dividends are given in millions of dollars, and are nominal payments converted to 1978 dollars using the consumer price index. Each cell amount is rounded to the nearest significant digit, which explains a few minor discrepancies across category totals.

	Real dividend payment (1978 dollars)	Number of firms 1978	Number of firms 2000	Change from 1978 to 2000	Percent change from 1978 to 2000 (%)	Real dividends 1978	Real dividends 2000	Change from 1978 to 2000	Percent change from 1978 to 2000 (%)
1.	$500 million or more	6	16	10	166.7	$9,095	$17,591	$8,496	93.4
2.	$400–$499.9 million	4	4	0	0.0	1,717	1,829	112	6.5
3.	$300–$399.9 million	4	6	2	50.0	1,441	2,005	564	39.1
4.	$200–$299.9 million	9	13	4	44.4	2,099	3,094	995	47.4
5.	$100–$199.9 million	19	37	18	94.7	2,630	5,062	2,432	92.5
6.	$80–$99.9 million	18	10	−8	−44.4	1,591	879	−712	−44.8
7.	$60–$79.9 million	24	21	−3	−12.5	1,649	1,462	−187	−11.3
8.	$40–$59.9 million	55	36	−19	−34.5	2,642	1,744	−898	−34.0
9.	$20–$39.9 million	108	66	−42	−38.9	3,003	1,883	−1,120	−37.3
10.	$10–$19.9 million	161	94	−67	−41.6	2,233	1,337	−896	−40.1
11.	$5–9.9 million	187	115	−72	−38.5	1,344	812	−532	−39.6
12.	$1–$4.9 million	633	276	−357	−56.4	1,523	655	−868	−57.0
13.	Less than $1 million	948	236	−712	−75.1	375	106	−269	−71.7
	Total	2,176	930	−1,246	−57.3	$31,342	$38,461	$7,118	22.7
	$100 million and above	42	76	34	81.0	$16,982	$29,582	$12,600	74.2
	Less than $100 million	2,134	854	−1,280	−60.0	14,360	8,878	−5,482	−38.2
	Less than $5 million	1,581	512	−1,069	−67.6	$1,898	$761	−$1,137	−60.0

and the next section strongly supports this hypothesis, indicating that (i) 1978 earnings are highly concentrated and 2000 earnings are considerably more so, (ii) the cross-sectional distribution of 2000 earnings is dominated by firms at the extremes, (iii) 28 firms with $1 billion-plus in real earnings generated the majority of 2000 aggregate earnings, (iv) these 28 top earners paid 50.1% of aggregate dividends in 2000, although 14.3% are nonpayers (up from 0.0% nonpayers among the top earners in 1978), (v) 2000 aggregate earnings exceed those of 1978, with most of the increase coming from firms at the top end of the earnings distribution, and (vi) for dividend-paying firms, the typical payout ratio is little changed over the past two decades.

Table 5 ranks dividend-paying firms by their earnings in 1978 and 2000, in a format similar to that of Table 3. Like dividends, earnings were highly concentrated in 1978, and substantial additional earnings concentration has occurred among dividend payers over the last two decades. In 1978, the top 100 dividend payers generated 57.5% of the earnings of all payers, while cumulatively the top 200 payers generated 71.0%. The corresponding figures for 2000 are 74.0% and 86.0%. From 1978 to 2000, the total real earnings of the 100 largest payers increased markedly, from $47.5 billion to $80.2 billion. The next two groups also show real increases, albeit of considerably more modest magnitudes, while all remaining groups show decreases. The net result is a 31.0% increase in the real earnings of dividend payers, from $82.7 billion in 1978 to $108.3 billion in 2000 (to $286.0 billion in year 2000 dollars).

4.1. The pooled earnings distribution of dividend payers and nonpayers

As background for our analysis of the earnings of dividend payers and nonpayers, Table 6 summarizes the cross-sectional earnings distribution of all firms (payers and nonpayers) combined. Panel A contains the pooled earnings distributions for 1978 and 2000. Since Lintner's (1956) analysis indicates that dividends tend to be set in response to long-run earnings rather than to a single (possibly aberrant) earnings realization, panel B reports the pooled distribution of average five-year earnings ending in 1978 and in 2000. The five-year averages are especially useful here because in 2000 industrial firms reported remarkably large losses (see Fig. 1), which may be a transitory phenomenon. If so, five-year average earnings better measure firms' long-run ability to pay dividends than do one-year earnings realizations.

Table 6 indicates that earnings in both 1978 and 2000 are concentrated among a relatively few firms at the top end of the distribution, and that such concentration is notably greater in 2000 than it was in 1978. The aggregate real earnings of payers and nonpayers combined increased from $85.0 billion in 1978 to $97.8 billion in 2000 ($258.3 billion in year 2000 dollars), while aggregate five-year average real earnings increased from $75.1 billion to $91.6 billion. These aggregate increases are driven by firms at the top end of the earnings distribution, especially in the $500 million-plus earnings categories, which show a total increase over 1978–2000 of $55.1 billion (182.8%) in one-year earnings, and $30.2 billion (117.2%) in five-year average earnings. These top-end increases far exceed the net aggregate increase in real earnings for all industrials as a group, and they comprise more than three-quarters of

Table 5

Concentration of earnings of industrial firms that paid dividends in 1978 and in 2000

Firms are ranked from the largest to smallest total dollar dividends paid in each year (per Compustat). The table reports the percent of total earnings generated by dividend-paying firms that are accounted for by the top 100 dividend payers, the next largest 100 payers, and so on. The sample includes NYSE, NASDAQ, and AMEX firms on CRSP that have share codes 10 and 11 and SIC codes outside the ranges 4900–4949 and 6000–6999. A firm is included only if Compustat reports dividends and earnings before extraordinary items for the year in question (Compustat items 21 and 18). A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. For 2000, the row corresponding to firms ranked from 901 to 1000 has 30 firms because there are 930 dividend payers that meet our sampling criteria in 2000.

Dividend ranking	Percent of total earnings of dividend-paying industrial firms (%)		Cumulative % of total earnings of dividend-paying industrial firms (%)		Real earnings ($ millions, 1978 base)	
	1978	2000	1978	2000	1978	2000
Top 100	57.5	74.0	57.5	74.0	$47,543	$80,158
101–200	13.5	12.0	71.0	86.0	11,170	12,912
201–300	7.2	6.2	78.2	92.2	5,929	6,733
301–400	5.1	3.0	83.3	95.1	4,242	3,197
401–500	3.8	2.2	87.1	97.3	3,134	2,376
501–600	2.5	1.4	89.6	98.8	2,045	1,540
601–700	2.0	0.5	91.6	99.3	1,694	545
701–800	1.5	0.4	93.1	99.7	1,274	482
801–900	1.4	0.2	94.5	99.9	1,134	263
901–1000	1.0	<0.1	95.5	100.0	819	45
1001–1100	0.8		96.3		694	
1101–1200	0.7		97.1		617	
1201–1300	0.6		97.7		506	
1301–1400	0.5		98.2		440	
1401–1500	0.4		98.6		293	
1501–1600	0.3		98.9		269	
1601–1700	0.3		99.2		248	
1701–1800	0.2		99.4		170	
1801–1900	0.2		99.6		173	
1901–2000	0.2		99.8		138	
2001–2100	0.1		99.9		69	
2101–2176	0.1		100.0		100	
Total for all firms	100.0	100.0	100.0	100.0	$82,701	$108,251
Number of firms					2,176	930

the large total earnings increase among firms with positive earnings. A similar picture emerges for firms with positive one-year earnings, a group that generated $86.1 billion in 1978 and $152.8 billion in 2000 real earnings, for an increase of $66.7 billion, or 77.5%, while those firms with positive five-year earnings generated an increase of $38.5 billion, or 50.9%.

The 2000 earnings distribution is concentrated at both the top and the bottom, with a full 44.7% of firms reporting losses. Strikingly, the dollar masses at the extremes are quite large and are roughly the same order of magnitude, although they are generated by a radically different number of firms. The 28 firms at the top earned

Table 6

Cross-sectional distributions of firms' real earnings (1978 dollars) in 1978 and in 2000:
Industrial firms on CRSP/Compustat

Panel A reports the distributions of real earnings in 1978 and in 2000. Panel B reports the distributions of five-year average real earnings ending in 1978 and in 2000. For example, the panel B figure for a given firm in 2000 equals the average of real earnings over the five years from 1996 to 2000 (or as many of those years that Compustat reports earnings data on that firm). The sample is comprised of NYSE, NASDAQ, and AMEX firms on CRSP with share codes 10 or 11 and SIC codes outside the intervals 4900–4949 and 6000–6999. A firm is included only if Compustat reports dividends and earnings before extraordinary items for the year in question (Compustat items 21 and 18). A firm's dividends and earnings are those amounts reported for the fiscal years ending in 1978 or 2000. Real earnings are nominal earnings before extraordinary items converted to 1978 dollars using the consumer price index.

Panel A. Cross-sectional distributions of real earnings in 1978 or in 2000

Real earnings (1978 dollars)	Number of firms		Real earnings ($ millions)		Real earnings as a % of total (%)	
	1978	2000	1978	2000	1978	2000
1. $1 billion or greater	9	28	$20,781	$64,229	24.4	65.6
2. $500 million - $1 billion	13	30	9,377	21,069	11.0	21.5
3. $250–500 million	28	50	9,716	17,094	11.4	17.5
4. $100–250 million	121	120	18,235	18,555	21.4	19.0
5. $50–100 million	136	176	9,327	12,120	11.0	12.4
6. $25–50 million	193	238	6,814	8,325	8.0	8.5
7. $10–25 million	388	427	6,261	6,880	7.4	7.0
8. $0–10 million	2,146	1,582	5,601	4,567	6.6	4.7
9. Negative earnings	306	2,144	−1,148	−54,991	−1.4	−56.2
Total	3,340	4,795	$84,964	$97,848	100.0	100.0
Total positive earnings only	3,034	2,651	$86,112	$152,839	—	—

Panel B. Cross-sectional distributions of five-year average real earnings ending in 1978 or in 2000

Five year average real earnings (1978 dollars)	Number of firms		Real earnings ($ millions)		Real earnings as a % of total (%)	
	1978	2000	1978	2000	1978	2000
1. $1 billion or greater	9	21	$18,541	$42,709	24.7	46.6
2. $500 million - $1 billion	10	21	7,261	13,328	9.7	14.6
3. $250–500 million	22	45	8,115	15,230	10.8	16.6
4. $100–250 million	106	92	15,734	14,663	20.9	16.0
5. $50–100 million	128	149	8,916	10,243	11.9	11.2
6. $25–50 million	179	213	6,425	7,424	8.6	8.1
7. $10–25 million	348	367	5,480	5,798	7.3	6.3
8. $0–10 million	2,147	1,742	5,260	4,862	7.0	5.3
9. Negative earnings	391	2,145	−627	−22,685	−0.8	−24.8
Total	3,340	4,795	$75,105	$91,572	100.0	100.0
Total positive earnings only	2,949	2,650	$75,732	$114,256	—	—

$64.2 billion (65.6% of aggregate earnings), while the 2,144 firms at the bottom lost $55.0 billion (−56.2%). This $55.0 billion in losses far exceeds the $1.1 billion total lost by 306 firms in 1978. This large upsurge in losses is consistent with the findings of Hayn (1995), Burgstahler and Dichev (1997), Fama and French (2001a,b), and Ritter and Welch (2002) who document a substantially increased loss incidence in recent years. While in 2000 most firms (1,554, not reported in Table 6) lost less than $10 million, 94 firms lost at least $100 million. Technology firms are prominent among the latter group, which includes Amazon, Web MD, Webvan, Priceline, Covad, Akamai, Ariba, JDS Uniphase, Earthlink, Broadcom, PSINet, MP3.Com, and CMGI. DeAngelo and DeAngelo (1990) and DeAngelo, DeAngelo, and Skinner (1992) document that losses play a key role in dividend cuts and omissions. These findings, combined with recent years' large increase in the incidence of losses, help explain why so many fewer industrial firms now pay dividends.

4.2. The separate earnings of dividend payers and nonpayers

The strong link between losses and the failure to pay dividends is evident from Table 7, which partitions the pooled distributions of real earnings from Table 6 into separate distributions for dividend payers and for nonpayers. Virtually all (2,056 of 2,144, or 95.9%) firms that reported losses failed to pay a dividend in 2000 (row 9 of panel A). The view that losses have driven many more firms to forego dividends is further supported by the fact that in 2000 nonpayers as a group lost $10.4 billion, while dividend payers as a group earned $108.3 billion.

Both panels of Table 7 document a strong positive relation between the level of earnings and the proportion of firms paying dividends, and they also show that the relation in 2000 is weaker than it was in 1978. For example, only 2.3% of the firms with earnings of $100 million-plus failed to pay dividends in 1978, compared to 28.1% in 2000. The fact that a smaller proportion of firms with a given level of real earnings paid dividends in 2000 than did so in 1978 is consistent with Fama and French's (2001a) conclusion that industrial firms now exhibit a lower propensity to pay dividends (although, unlike the estimates of Fama and French, our numbers do not control for growth opportunities). In 2000, a number of firms with large positive earnings failed to pay dividends (see rows 1–3 in both panels of Table 7), whereas no firms with comparably large earnings failed to do so in 1978.

Despite this reduced propensity to pay, aggregate real dividends increased by $7.1 billion from 1978 to 2000 (per Table 2). Several factors are jointly responsible. Most fundamentally, aggregate real earnings increased from 1978 to 2000 and, while earnings are concentrated in 1978, they are more so in 2000. Second, although the percentage of firms with earnings of $1 billion-plus that pays dividends has fallen from 100.0% in 1978 to 85.7% in 2000, the percentage remains high, and these firms' earnings have increased substantially, from $20.8 billion in 1978 to $55.7 billion in 2000. Importantly, this group's dividends increased by $8.9 billion (not reported in the table), despite its reduced fraction of payers, and this amount exceeds the entire $7.1 billion increase in aggregate dividends from 1978 to 2000. In sum, the substantial increase in real earnings at the top end of the distribution, coupled with

Table 7

Real earnings (1978 dollars) for industrial firms in 1978 and in 2000: Sample partitioned into dividend payers and nonpayers

Panel A reports the distribution of real earnings for payers and nonpayers in 1978 and in 2000. Panel B reports the distribution of average real earnings over the five-year period ending with 1978 (or 2000), or over as many of those years as Compustat provides earnings data. The sample consists of NYSE, NASDAQ, and AMEX firms on CRSP with share codes 10 or 11 and SIC codes outside the intervals 4900–4949 and 6000–6999. A firm is included in a given year only if Compustat reports data on dividends and earnings (Compustat items 21 and 18). A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. Real earnings are nominal earnings before extraordinary items converted to 1978 dollars using the consumer price index. The "percentage from payers" columns report the percent of total earnings that comes from dividend-paying firms. Amounts have been rounded to the nearest significant digit, which accounts for a few minor discrepancies across category totals.

Real earnings (1978 dollars)	1978 Number of firms			2000 Number of firms			1978 Earnings ($ millions)			2000 Real earnings ($ millions)		
	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)
Panel A. Real earnings distribution for payers and nonpayers in 1978 and in 2000												
1. $1 billion or greater	9	0	100.0	24	4	85.7	$20,781	$0	100.0	$55,687	$8,542	86.7
2. $500 million - $1 billion	13	0	100.0	23	7	76.7	9,377	0	100.0	16,207	4,862	76.9
3. $250–500 million	28	0	100.0	38	12	76.0	9,716	0	100.0	13,091	4,003	76.6
4. $100–250 million	117	4	96.7	79	41	65.8	17,619	616	96.6	12,242	6,313	66.0
5. $50–100 million	130	6	95.6	95	81	54.0	8,961	365	96.1	6,543	5,577	54.0
6. $25–50 million	185	8	95.9	113	125	47.5	6,519	295	95.7	3,933	4,392	47.2
7. $10–25 million	358	30	92.3	154	273	36.1	5,802	459	92.7	2,531	4,350	36.8
8. $0–10 million	1,284	862	59.8	316	1,266	20.0	4,404	1,197	78.6	1,178	3,389	25.8
9. Negative earnings	52	254	17.0	88	2,056	4.1	−480	−668	41.8	−3,160	−51,831	5.7
Total	2,176	1,164	65.1	930	3,865	19.4	$82,701	$2,263	97.3	$108,251	−$10,403	—
Panel B. Five-year average real earnings distribution for payers and nonpayers ending in 1978 and in 2000												
1. $1 billion or greater	9	0	100.0	20	1	95.2	$18,541	$0	100.0	$40,563	$2,145	95.0
2. $500 million - $1 billion	10	0	100.0	19	2	90.5	7,261	0	100.0	11,933	1,395	89.5
3. $250–500 million	22	0	100.0	34	11	75.6	8,115	0	100.0	11,579	3,651	76.0
4. $100–250 million	105	1	99.1	75	17	81.5	15,579	155	99.0	12,218	2,445	83.3
5. $50–100 million	123	5	96.1	96	53	64.4	8,569	347	96.1	6,730	3,513	65.7
6. $25–50 million	171	8	95.5	114	99	53.5	6,127	298	95.4	4,046	3,378	54.5

Table 12. (*Continued*)

Real earnings (1978 dollars)	1978 Number of firms			2000 Number of firms			1978 Earnings ($ millions)			2000 Real earnings ($ millions)		
	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)	Payers	Non payers	Percentage from payers (%)
7. $10–25 million	330	18	94.8	168	199	45.8	5,200	280	94.9	2,770	3,028	47.8
8. $0–10 million	1,387	760	64.6	361	1,381	20.7	4,376	884	83.2	1,444	3,418	29.7
9. Negative earnings	19	372	4.9	43	2,102	2.0	−52	−575	8.3	−628	−22,057	2.8
Total	2,176	1,164	65.1	930	3,865	19.4	$73,716	$1,389	98.2	$90,656	$916	99.0

the continued strong tendency of top earners to pay dividends, is sufficient to generate an aggregate dividend increase despite both the large reduction in the number of small dividend payers and the modest increase in the number of firms with very large earnings that fail to pay dividends.

4.3. Payout ratios and the propensity to pay dividends

The term ''reduced propensity to pay'' seems to imply that dividend-paying firms now distribute a lower proportion of their earnings than they used to.[3] That there has *not* been a reduced propensity to pay in this sense is clear from the essentially flat payout ratio data in Table 8. Row 1 of the table reports that the ratio of aggregate dividends to aggregate earnings of payers and nonpayers combined increased slightly, both when current year earnings are used in the denominator (from 36.9% to 39.3%), and when five-year average earnings are used (from 41.7% to 42.0%).[4] A shortcoming of the row 1 payout ratios is that they combine the earnings of payers and nonpayers and thus provide no information about the time series behavior of the payout ratios of dividend-paying firms.

Table 8's remaining payout ratios remedy this deficiency by incorporating only the earnings of dividend-paying firms. Row 2 reports the ratio of aggregate dividends to the total earnings of dividend payers, while row 3 presents the median of individual firms' payout ratios. Rows 4 and 5 report the same statistics for the ''constant composition sample'' of 474 firms that paid dividends in both 1978 and 2000. Although the latter sample suffers from a survivorship bias, it also likely captures genuine changes in payout policy as opposed to differences over time in the population of dividend-paying firms. The payout ratios in rows 3 and 5 give equal weight to all observations, while those in rows 2 and 4 give more weight to firms with large dividends and earnings.

Overall, payout ratios exhibit little change over the last two decades, with some of the ratios in Table 8 exhibiting slight increases and others slight decreases. Row 2 shows that the ratio of aggregate dividends to total earnings of payers declined 2.4%, from 37.9% in 1978 to 35.5% in 2000, based on a single year's earnings, while the ratio based on five-year average earnings decreased 0.1%, from 42.5% to 42.4%. Row 3 indicates that the median payout ratio increased 2.2%, from 26.2% to 28.4%, based on the one-year earnings measure, and decreased 0.7%, from 31.1% to 30.4%, based on five-year average earnings. For the constant composition sample in rows 4

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[3] Fama and French (2001a) use ''reduced propensity to pay'' in a different sense, to represent the idea that there are now more firms that pay zero dividends than would have done so historically based on their economic fundamentals. The payout ratio evidence discussed below is consistent with that of Fama and French (2001a, p. 38) who find no indication of a decline over 1978–1998 in the ratio of aggregate dividends to the total earnings of payers.

[4] When we calculate an aggregate dividend payout ratio using the summed earnings of all payers and nonpayers with positive earnings, we find a decline from 36.4% in 1978 to 25.2% in 2000 (from 41.4% to 33.7% using five-year average earnings). But these declines reflect the fact that the earnings divisor of this payout ratio includes the positive earnings of firms that paid no dividends in 2000, including a small number of very large earners such as Microsoft, which we discuss in Section 5. Hence, these declines are not evidence that firms that do pay dividends now have lower payout ratios.

Table 8

Aggregate and median dividend payout ratios for industrial firms on CRSP/Compustat, 1978 and 2000
The payout ratios in rows 1 and 2 are based on aggregate dividends paid by industrial firms in 1978 or in 2000. Row 1 takes the denominator to be the sum of earnings for all industrials (payers and nonpayers), while row 2 takes the denominator to be the sum of earnings for payers only. Row 3 reports the median firm's payout ratio within the set of firms that paid dividends. The payout ratios in row 4 and 5 are based on dividends and earnings for the constant composition sample of 474 firms that paid dividends in both 1978 and in 2000. Row 4 defines the payout ratio in a given year as (1) total dividends paid by firms in the constant composition sample divided by (2) total earnings of all firms in that sample. Row 5 reports the median firm's payout ratio within the constant composition sample. The columns marked ''One-year earnings'' report payout ratios based on earnings in the year in question. The columns marked ''Five-year average real earnings'' report payout ratios based on a firm's average real earnings over the five years ending with the year in question (or as many of those years that Compustat reports earnings data for the firm). For example, for a given firm in 2000, the earnings variable is the average of earnings over the five years 1996–2000, with each year's earnings converted to 2000 dollars using the consumer price index. The full sample of industrial firms consists of NYSE, NASDAQ, and AMEX firms on CRSP with share codes 10 or 11 and SIC codes outside the intervals 4900–4949 and 6000–6999. A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. A firm is included in a given year only if Compustat has data on dividends and earnings (Compustat items 21 and 18). Earnings are before extraordinary items.

	One-year earnings (%)		Five-year average real earnings (%)	
Payout ratio measure	1978	2000	1978	2000
1. Aggregate dividends/aggregate earnings (payers and nonpayers pooled)	36.9	39.3	41.7	42.0
2. Aggregate dividends/total earnings of dividend payers	37.9	35.5	42.5	42.4
3. Median firm's payout ratio (dividend payers)	26.2	28.4	31.1	30.4
4. Constant composition sample of firms that paid dividends in both 1978 and 2000: total dividends/total earnings of these dividend payers	41.3	37.7	47.0	43.6
5. Constant composition sample of firms that paid dividends in both 1978 and 2000: median firm's payout ratio	27.5	33.0	33.7	31.9

and 5, three of four payout ratios decreased (by 3.6%, 3.4%, and 1.8%) while the other increased (by 5.5%). For this last sample, the median change in the payout ratio (as opposed to the change in the median, which is reported in Table 8) is 5.2% from 1978 to 2000 based on one-year earnings and 2.3% based on five-year average earnings (details not in table). In sum, we find little indication of a substantial change (up or down) over the last two decades in the payout ratios of dividend-paying firms.[5]

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[5] Fama and French (2001a, p. 35) study the recent upsurge in stock repurchases and find that repurchase activity is dominated by dividend-paying firms, so that repurchases increase the ''already high'' cash payouts of payers. Thus, although repurchases have increased in recent years (both absolutely and relative to dividends), dividend payers have apparently used repurchases to increase the overall fraction of earnings distributed to stockholders.

5. The identity of the top payers, nonpayers, and earners in 2000

Table 9 identifies the 25 industrials that paid the largest dividends in 2000, ranked in descending order of dividends paid. These primary dividend suppliers are well-established firms such as Exxon Mobil and General Electric, with 14 of the 25 included in the Dow Jones Industrial Average (DJIA). The top 25 payers distributed 54.9% of aggregate industrial dividends in 2000, and their $9.2 billion real dividend increase over 1978–2000 markedly exceeds the $7.1 billion aggregate increase for industrials as a whole (per Table 2). Their dominance of the aggregate dividend supply reflects these 25 firms' $50.3 billion in real earnings ($132.8 billion in year 2000 dollars), which is 51.4% of aggregate industrial earnings, and represents a $26.2 billion real earnings increase from 1978 to 2000. Nineteen of the top 25 payers had $1 billion-plus in real earnings for 2000, and the real earnings increases of the top three alone totaled $9.7 billion over 1978–2000. In short, a handful of "old line" firms now both generates over half of industrial earnings and dominates the associated supply of dividends.

While earnings concentration is striking among dividend payers, it is also very high among nonpayers. Table 10 ranks the 25 nonpayers with the highest 2000 earnings, and reports their cumulative share of the earnings of all nonpayers with positive income. Four nonpayers—Microsoft, the only nonpayer in the DJIA, Oracle, WorldCom, and Cisco—reported real earnings of more than $1 billion in 2000, and these firms alone account for 20.6% of all positive earnings of nonpayers. The top 10 and top 25 nonpayers respectively generated 31.0% and 43.2% of such earnings, and just 39 nonpayers accounted for a majority (50.1%, not reported in Table 10).[6] That a handful of technology firms dominates the earnings of nonpayers is clear from scanning the identities of the 25 firms in Table 10, and any dampening of the aggregate dividend supply in recent years is due in no small part to their failure to initiate dividends.

These firms' decisions to forgo dividends more likely reflect their continued high growth prospects than a reduced propensity to pay dividends and, as their growth prospects decline, they will likely come under pressure to pay dividends. Microsoft, widely viewed as a bellwether technology company, has recently announced plans to institute a regular dividend, and Qualcomm and Fedex have also initiated dividends, so that three of the top 25 nonpayers in Table 10 would now be reclassified as payers. Additionally, the numerous corporate scandals uncovered in the last year or so may prompt growth firms to initiate dividends at an earlier stage, in order to increase investor confidence in their reported earnings. Moreover, President Bush's January 2003 proposal to eliminate the dividend tax penalty would, if enacted, surely put more pressure on firms to pay dividends. All these recent developments suggest that a future reversal of the decline in the number of dividend-paying industrials is a reasonable possibility.

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[6] The earnings of the top 25 nonpayers represent 11.7% of the earnings of all firms (payers and nonpayers combined) with positive income, and 18.3% of aggregate industrial earnings.

Table 9
Dividends and earnings in 1978 and in 2000 for the 25 industrial firms that paid the largest dividends in 2000

The table lists the 25 industrial firms on CRSP/Compustat that paid the largest total dividends in 2000, with firms ranked in descending order of dividends paid. All but three of these firms are in our 1978 sample and also paid dividends in that year. [Verizon (Bell Atlantic), SBC, and BellSouth were subsidiaries of AT&T in 1978, and are "baby bells" that were spun off in 1984. AT&T's real dividends and earnings in 2000 would be well above their 1978 levels if we added back the dividends and earnings of the spun off "baby bells."] Real dividends and earnings in 2000 are nominal values converted to 1978 dollars using the consumer price index. A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. The next-to-last and last columns respectively give year 2000 dividends and earnings in nominal terms (i.e., denominated in year 2000 dollars).

		Real dividends ($ millions, 1978 base)			Real earnings ($ millions, 1978 base)			Nominal dividends and earnings ($ millions)	
		1978	2000	Change	1978	2000	Change	2000	2000
1.	Exxon Mobil	$1,472	$2,318	$846	$2,763	$6,054	$3,291	$6,122	$15,989
2.	General Electric	570	2,138	1,568	1,230	4,822	3,592	5,647	12,735
3.	Philip Morris	125	1,722	1,597	409	3,222	2,814	4,548	8,510
4.	Verizon	—	1,672	1,672	—	4,093	4,093	4,416	10,810
5.	SBC	—	1,304	1,304	—	3,017	3,017	3,444	7,968
6.	Merck	132	1,100	968	308	2,583	2,275	2,905	6,822
7.	Ford	417	1,036	619	1,589	2,048	460	2,736	5,409
8.	Pfizer	82	973	890	206	1,408	1,202	2,570	3,719
9.	AT&T	3,038	941	−2,097	5,273	1,768	−3,505	2,485	4,669
10.	Bristol Myers Squibb	77	731	654	203	1,551	1,348	1,931	4,096

No.	Firm								
11.	Johnson & Johnson	101	653	552	299	1,817	1,518	1,725	4,799
12.	Chevron	435	639	205	1,106	1,963	857	1,688	5,184
13.	Coca-Cola	215	638	423	375	824	450	1,685	2,176
14.	Procter & Gamble	223	636	413	512	1,341	829	1,680	3,542
15.	Du Pont	348	551	203	787	876	89	1,455	2,314
16.	BellSouth	—	539	539	—	1,598	1,598	1,424	4,220
17.	General Motors	1,713	490	−1,223	3,508	1,686	−1,822	1,294	4,453
18.	American Home Products	207	455	248	348	−341	−690	1,202	−901
19.	Abbott Labs	47	446	399	149	1,055	906	1,178	2,786
20.	Eli Lilly	116	439	322	277	1,158	880	1,159	3,058
21.	Texaco	543	370	−173	852	962	110	977	2,541
22.	3M	234	348	114	563	703	140	919	1,857
23.	IBM	1,763	344	−1,419	3,111	3,064	−46	909	8,092
24.	Wal-Mart	2	337	335	22	2,111	2,089	890	5,575
25.	Schering-Plough	65	304	239	194	917	724	803	2,422
	Total for 25 firms	$11,925	$21,124	$9,198	$24,084	$50,300	$26,219	$55,792	$132,845
	Total as a % of aggregate for all industrials	38.0%	54.9%		28.3%	51.4%		54.9%	51.4%

Table 10

2000 earnings for the 25 nondividend-paying industrial firms with the highest reported earnings

The table lists the 25 nondividend-paying industrial firms on CRSP/Compustat with the highest earnings in 2000, ranked in descending order of earnings in that year. WorldCom is classified by Compustat as not paying dividends, even though the tracking stock for its MCI unit did pay dividends in 2000. Our empirical work employs Compustat dividend amounts for all sample firms. The recent accounting scandal at WorldCom implies that its year 2000 Compustat earnings are overstated. Real earnings are nominal earnings in 2000 converted to 1978 dollars using the consumer price index. A firm's earnings for 2000 is the amount reported for the fiscal year ending in that year. The last column gives the cumulative total earnings as a fraction of the total earnings in 2000 of all nondividend payers with positive earnings in that year. All earnings figures are before extraordinary items.

		Real earnings in 2000 ($ millions, 1978 base)	Nominal earnings in 2000 ($ millions)	Cumulative earnings as a percent of total earnings of all nonpayers with positive earnings in 2000 (%)
1.	Microsoft	$3,567	$9,421	8.6
2.	Oracle	2,384	6,297	14.4
3.	WorldCom	1,580	4,174	18.2
4.	Cisco Systems	1,010	2,668	20.6
5.	Applied Materials	781	2,064	22.5
6.	Comcast	774	2,045	24.4
7.	Cox Communications	729	1,925	26.1
8.	Sun Microsystems	702	1,854	27.8
9.	EMC	675	1,782	29.5
10.	Dell Computer	631	1,666	31.0
11.	Micron Technology	570	1,504	32.4
12.	AOL Time Warner	466	1,232	33.5
13.	Amgen	431	1,139	34.5
14.	Safeway	413	1,092	35.5
15.	Advanced Micro Devices	381	1,006	36.4
16.	ADC Telecommunications	329	868	37.2
17.	Federated Department Stores	301	795	38.0
18.	Apple Computer	298	786	38.7
19.	AMR	295	779	39.4
20.	Tellabs	288	760	40.1
21.	Agilent Technologies	287	757	40.8
22.	Fedex	261	688	41.4
23.	Qualcomm	254	670	42.0
24.	Xilinx	247	652	42.6
25.	Alliance Semiconductor	245	648	43.2
	Total for 25 firms	$17,899	$47,273	43.2

Table 11 identifies the 28 firms with $1 billion-plus in real earnings in 2000, which is just over $2.5 billion in year 2000 dollars. Together, these 28 firms account for almost two-thirds (65.6%) of 2000 aggregate industrial earnings. In 2000, 24 of these firms paid dividends, and in total their dividends represent a majority (50.1%) of the industrial dividend supply. The 28 largest earners are primarily "old line" firms that

Table 11

Dividends and earnings in 1978 and in 2000 for the 28 industrial firms with at least $1 billion in real earnings in 2000

The table lists the 28 industrial firms on CRSP/Compustat that report at least $1 billion in real earnings in 2000, with firms ranked in descending order of 2000 earnings. Real dividends and earnings in 2000 are nominal values converted to 1978 dollars using the consumer price index. A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. The next-to-last and last columns respectively give year 2000 dividends and earnings in nominal terms (i.e., denominated in year 2000 dollars). WorldCom is classified by Compustat as not paying dividends in 2000, even though the tracking stock for its MCI unit did pay dividends in that year, and we follow Compustat's classification. Verizon (Bell Atlantic), Microsoft, SBC, Oracle, BellSouth, WorldCom, UPS, and Cisco are not in our 1978 sample. However, Verizon, SBC, and BellSouth are "baby bells" that were spun off from AT&T in 1984, and thus in 1978 were subsidiaries of AT&T (which is in the 1978 sample). The numbers are rounded to the nearest significant digit, which accounts for a few discrepancies across category totals.

		Real dividends ($ millions, 1978 base)			Real earnings ($ millions, 1978 base)			Nominal dividends and earnings ($ millions)	
		1978	2000	Change	1978	2000	Change	2000	2000
1.	Exxon Mobil	$1,472	$2,318	$846	$2,763	$6,054	$3,291	$6,122	15,989
2.	General Electric	570	2,138	1,568	1,230	4,822	3,592	5,647	12,735
3.	Verizon	—	1,672	1,672	—	4,093	4,093	4,416	10,810
4.	Intel	0	178	178	44	3,989	3,945	470	10,535
5.	Microsoft	—	0	0	—	3,567	3,567	0	9,421
6.	Philip Morris	125	1,722	1,597	409	3,222	2,814	4,548	8,510
7.	IBM	1,763	344	−1,419	3,111	3,064	−46	909	8,092
8.	SBC	—	1,304	1,304	—	3,017	3,017	3,444	7,968
9.	Merck	132	1,100	968	308	2,583	2,275	2,905	6,822
10.	Oracle	—	0	0	—	2,384	2,384	0	6,296
11.	Wal-Mart	2	337	335	22	2,111	2,089	890	5,575
12.	Ford	417	1,036	619	1,589	2,048	460	2,736	5,409
13.	Chevron	435	639	205	1,106	1,963	857	1,688	5,184
14.	Johnson & Johnson	101	653	552	299	1,817	1,518	1,725	4,799
15.	AT&T	3,038	941	−2,097	5,273	1,768	−3,505	2,485	4,669
16.	Tyco	1	32	31	12	1,711	1,699	85	4,519
17.	General Motors	1,713	490	−1,223	3,508	1,686	−1,822	1,294	4,453
18.	BellSouth	—	539	539	—	1,598	1,598	1,424	4,220
19.	WorldCom	—	0	0	—	1,580	1,580	0	4,173

Table 12. (*Continued*)

		Real dividends ($ millions, 1978 base)			Real earnings ($ millions, 1978 base)			Nominal dividends and earnings ($ millions)	
		1978	2000	Change	1978	2000	Change	2000	2000
20.	Bristol Myers Squibb	77	731	654	203	1,551	1,348	1,931	4,096
21.	Pfizer	82	973	890	206	1,408	1,202	2,570	3,719
22.	Hewlett-Packard	14	242	228	153	1,348	1,195	639	3,560
23.	Procter & Gamble	223	636	413	512	1,341	829	1,680	3,542
24.	Texas Instruments	40	53	13	140	1,169	1,029	140	3,087
25.	Eli Lilly	116	439	322	277	1,158	880	1,159	3,058
26.	UPS	—	298	298	—	1,111	1,111	787	2,934
27.	Abbott Labs	47	446	399	149	1,055	906	1,178	2,786
28.	Cisco	—	0	0	—	1,010	1,010	0	2,668
	Total for 28 firms	$10,368	$19,261	$8,892	$21,314	$64,229	$42,916	$50,872	$169,629
	Total as a % of aggregate for all industrials	33.1%	50.1%		24.8%	65.6%		50.1%	65.6%

pay very large dividends, but they also include some profitable younger technology firms that pay either modest or no dividends. Of the four large earners that failed to pay 2000 dividends, Microsoft has since initiated a dividend, Oracle and Cisco have said they would consider doing so, and WorldCom's accounting fraud implies that its #19 ranking in Table 11 substantially overstates its true earnings position in 2000.

Overall, industrial firms are characterized by a two-tier structure based on earnings, with 25 or so firms (about one-half of 1% of all industrials) accounting for most earnings and dividends in 2000, and with the vast majority of firms collectively delivering small earnings and dividends. Tables 9–11 show that the top handful of earners generated the bulk of corporate earnings and, despite some large earners like Microsoft that did not pay dividends, also supplied the majority of industrial dividends in 2000. We also know from Table 6 that 3,726 firms or 77.7% of all industrial firms in 2000 individually earned $10 million or less, and these firms as a group lost about $50 billion. These 3,726 firms paid total dividends of $2.1 billion, or 5.5% of the aggregate industrial supply. More than half of this $2.1 billion total was paid by seven large firms with current losses or very low earnings, and more than three-quarters was paid by 30 firms in a similar situation (including American Home Products, Xerox, Lockheed, USX, Dow Jones, and Pennzoil). Therefore, in 2000, some 3,700 firms (over three-quarters by number) collectively paid dividends of about $0.5 billion (1.3% of the aggregate), whereas the top 25 payers (0.5% by number) paid roughly 40 times that amount.

6. What happened to the dividend payers of 1978?

Table 12 classifies the 2,176 firms that paid dividends in 1978 (column (1)) according to whether they also paid dividends in 2000 (column (2)), remained listed in 2000 but did not pay dividends in that year (column (3)), and the primary reasons for delisting, either financial distress (column (4)) or acquisition (column (5)). Financially distressed delists include all firms with CRSP delist codes 500–599 (delisted or stopped trading) or 400–499 delist codes (liquidations) for which The Wall Street Journal Index (WSJI) provides no clear indication that the firm was acquired. Acquisition delists include all firms with delist codes 200–299 (mergers), or 300–499 (security exchanges and liquidations) for which the WSJI indicates that the company was acquired.[7]

Although much reduced in number, the set of 474 firms that paid dividends in both 1978 and 2000 accounts for a large majority of industrial dividends and earnings in 2000 (79.5% and 83.1% respectively)—another manifestation of the fact

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[7] This classification scheme is similar to that of Fama and French (2001b, Table 4), who treat codes 200–399 as delisted due to merger and 400–599 as delisted for "cause". The 1,647 firm total of columns (3)–(5) in our Table 12 falls 55 firms short of the 1,702 firm difference between columns (1) and (2). The reason is that we omit 40 delists with codes 300–399 that the WSJI did not show as acquired and 15 firms without dividends and earnings on Compustat for 2000. The former firms had paid $136 million in 1978 dividends, while the latter had paid $254 million.

Table 12

Listing and dividend status in 2000 for the 2,176 industrial firms that paid dividends in 1978: Sample partitioned by size of 1978 dividend payment

The sample includes all NYSE, NASDAQ, and AMEX firms on CRSP that have share codes 10 and 11 and SIC codes outside the ranges 4900–4949 and 6000–6999, and that have nonmissing values on Compustat of dividends and earnings before extraordinary items for 1978 (Compustat items 21 and 18). Column (2) contains firms that were in our sample in 1978 and in 2000, and that paid dividends in both years. Column (3) contains firms that paid dividends in 1978 and that remained publicly traded in 2000, but no longer paid dividends. Columns (4) and (5) contain dividend-paying firms that are in our 1978 sample, but that were delisted post-1978 due either to acquisition or financial distress, and thus are not in the 2000 sample. The financially troubled delistings in column (4) include (i) all cases with CRSP delist codes in the range 500–599 and (ii) those cases with delist codes in the range 400–499 for which we found no evidence in the Wall Street Journal Index (WSJI) that the firm was acquired. The acquisition delistings in column (5) include (i) all cases with CRSP delist codes in the range 200–299 and (ii) those cases with CRSP delist codes in the range 300–499 for which we found evidence in the WSJI that the company was acquired. The subsamples in columns (2) through (5) are mutually exclusive, but not exhaustive. They exclude 40 firms with delist codes in the range 300–399 for which we found no evidence in the WSJI that the firm was acquired. They also exclude 15 firms for which Compustat does not report dividends and earnings data for 2000. A firm's dividends and earnings are the amounts reported for the fiscal years ending in 1978 or 2000. Real dividends and earnings in 2000 are nominal values converted to 1978 dollars using the consumer price index.

Dividend payment in 1978	All dividend payers in 1978 (1)	Paid dividends in 2000 (2)	Listed, but not dividend payer in 2000 (3)	Delisted due to financial distress (4)	Delisted due to acquisition (5)
1. $500 million or greater	6	6	0	0	0
2. $400–499.9 million	4	2	0	0	2
3. $300–399.9 million	4	3	0	0	1
4. $200–299.9 million	9	6	0	0	3
5. $100–199.9 million	19	14	0	0	4
6. $80–99.9 million	18	12	0	0	6
7. $60–79.9 million	24	9	5	0	10
8. $40–59.9 million	55	19	4	1	29
9. $20–39.9 million	108	37	7	1	61
10. $10–19.9 million	161	58	5	9	84
11. $5–9.9 million	187	51	9	7	118
12. $1–4.9 million	633	143	43	46	389
13. Less than $1 million	948	114	86	175	542
Total number of firms	2,176 firms	474 firms	159 firms	239 firms	1,249 firms
(% of 1978 industrial total)	(100.0%)	(21.8%)	(7.3%)	(11.0%)	(57.4%)
Total 1978 dividends	$31.3 billion	$19.5 billion	$1.0 billion	$0.4 billion	$10.0 billion
(% of 1978 industrial total)	(100.0%)	(62.3%)	(3.2%)	(1.3%)	(31.9%)
Total 2000 real dividends	—	$30.6 billion	$0.0 billion	—	—
(% of 2000 industrial total)		(79.5%)	(0.0%)		
Total 1978 earnings	$82.7 billion	$47.3 billion	$3.9 billion	$1.3 billion	$28.9 billion
(% of 1978 industrial total)	(97.3%)	(55.7%)	(4.6%)	(1.5%)	(34.0%)
Total 2000 real earnings	—	$81.3 billion	$2.0 billion	—	—
(% of 2000 industrial total)		(83.1%)	(2.0%)		

that dividends and earnings are highly concentrated among "old line" firms. The 159 firms that stopped paying dividends between 1978 and 2000 had paid only $1.0 billion (3.2% of the aggregate) in 1978. These firms' 2000 nonpayments reflect financial distress for at least some companies, since 2000 total earnings were nearly 50% below 1978 earnings for this group. Most of the 239 financially distressed delists were small payers, with 221 firms (92.5%) having paid $5 million or less, and these firms' 1978 dividends totaled $0.4 billion, or 1.3% of the aggregate. So, while financial distress and earnings difficulties together reduced the number of dividend payers by 398 firms between 1978 and 2000, the associated dividend loss is just $1.4 billion. The $10.0 billion (31.9%) dividend loss from acquisition delists is markedly larger, as is the loss in the number of payers due to acquisitions (1,249 firms, or 57.4% of the 1978 payers).

While acquisitions are thus the primary, and financial distress the secondary, reason why so many 1978 payers no longer disburse dividends, these two factors affect aggregate dividends in different ways. The dividends of financially distressed firms are lost, whereas in many cases an acquired firm's dividends are not lost, but are simply relabeled. For example, the issuance of acquirer shares to target stockholders increases the acquirer's total dividend, and thereby continues the target's dividend at least in part.[8] Exxon and Mobil respectively paid $4.0 billion and $1.8 billion in 1998 dividends, while after their November 1999 merger, the new Exxon Mobil paid $6.1 billion in 2000 dividends. In the aggregate, such acquisitions do not eliminate dividends, but simply channel them to investors through a smaller number of firms. Thus, acquisitions reduce the number of dividend-paying firms with no necessary reduction in aggregate dividends, a point that carries special significance here because the post-1978 decline in the number of payers occurred during a massive merger wave.

In fact, the merger wave of the 1980s and 1990s explains a substantial portion of the decline in the number of dividend payers over 1978–2000. The abnormal number of delists attributable to the merger wave equals the actual merger delists (1,249 firms, per Table 12) minus the number of mergers that would have occurred, absent the wave. Fama and French (2001a, Table 2) report that dividend payers were acquired at average annual rates of 3.9% over 1978–1999, 2.7% over 1963–1977, and 0.6% over 1927–1962. The normal merger rate probably lies somewhere between 0.6% and 2.7% since 1927–1962 is a wave-free period, while 1963–1977 includes the conglomerate wave. If 0.6% is the relevant benchmark, the abnormal delists attributable to the recent merger wave is 979 firms, and it is 265 firms if 2.7% is the appropriate benchmark.[9] In either case, a reasonable portion of the actual

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[8] Acquisitions for stock were especially prevalent in the 1990s. Andrade et al. (2001, pp. 104–106) report that 57.8% of acquisitions over 1990–1998 were for all stock, while 70.9% involved at least some stock. They also report that, during the 1980s, 32.9% of acquisitions were for all stock, and 45.6% involved some stock.

[9] We calculate the expected attrition (compounded at either 0.6% or 2.7%) over 22 years starting from a base of 2,176 firms, the number of 1978 payers. The abnormal number of acquisitions equals 1,249 minus the expected attrition. The expected attrition at Fama and French's 3.9% merger rate over 1978–1999 is 1,269 firms, which is virtually identical to the 1,249-firm decline in Table 12.

merger delists, hence of the decline in the number of dividend payers, is due to the recent merger wave. However, as Fama and French (2001a, p.11) point out, since dividend payers and nonpayers were acquired at about the same rates during the last two decades, acquisitions cannot explain the decline in the *proportion* of payers.

7. Summary and implications

This paper reports evidence that industrial firms' dividends are highly concentrated, and that dividend concentration has increased over the past two decades. We document that, while many fewer firms paid dividends in 2000 than did so in 1978, aggregate real dividends increased over that period. The combination of a decreased number of payers and increased aggregate dividends reflects high and increased earnings concentration. In 2000, most firms with very high earnings paid dividends, and the increased real earnings of the largest dividend payers is responsible for the aggregate increase in dividends and the concomitant increase in dividend concentration over 1978–2000. In 2000, nearly half of industrial firms reported losses and, as one would expect, few of these firms paid dividends. The decline over 1978–2000 in the number of dividend payers occurred predominantly among firms that previously paid very small real dividends, and is due primarily to acquisitions and secondarily to financial distress. For example, we find that 57.4% of the firms that paid dividends in 1978 were subsequently delisted because they were acquired, and that the abnormal level of acquisitions during the recent merger wave accounts for much, but not all, of the decline in the number of payers. We also find that the payout ratios of firms that pay dividends exhibit little change over 1978–2000.

These findings collectively suggest that the decline in dividend payers over 1978–2000 is not attributable to factors that put across-the-board downward pressure on dividends or on payout ratios. For example, income tax law changes cannot plausibly underlie the decline in payers, since any increase in the dividend tax penalty that led many more firms to pay zero dividends also should have led dividend payers to markedly reduce their payout ratios, and we observe no such reduction. The same logic implies that the sharp reduction in the number of payers was not caused by demand- and/or supply related factors that generated a cross-sectionally pervasive reduction in the marginal incentive to pay dividends. This inference is reinforced by the fact that the earnings of nonpayers, like those of payers, are highly concentrated, with 25 firms accounting for almost half the total earnings of all nonpayers with positive earnings in 2000. Over one-third of these total earnings come from just 13 firms with a strong technology bent: Microsoft, Oracle, WorldCom, Cisco, Applied Materials, Comcast, Cox Communications, Sun, EMC, Dell, Micron Technology, AOL Time Warner, and Amgen. The decision to forgo dividends by high growth technology firms with substantial earnings more likely reflects industry-specific investment opportunities rather than economy-wide factors that reduced all firms' incentives to pay dividends.

Our findings on dividend concentration cast doubt on the empirical importance of the dividend clientele and signaling hypotheses (Allen and Michaely, 1995, survey the extensive literatures on these two hypotheses). Clientele theories attribute heterogeneity in dividend policies to the demands of different investors who, for tax or behavioral reasons, prefer either to hold or to avoid dividend-paying stocks. Black and Scholes (1974) discuss the difficulties of forming well-diversified portfolios of stocks that pay either high or low dividends, and note the dearth of nondividend payers to service the demands of the many investors who prefer capital gains. While on the surface the large increase since the late 1970s in the number of nondividend-paying firms might appear to rectify this shortcoming, the attributes of the current population of nonpayers suggest that well-diversified portfolios of their stocks are not easily constructed. Among nonpayers in 2000, the majority of firms has negative earnings averaged over 1996–2000, many are newly listed growth firms, and many are from the technology sector. Even if some investors could construct well-diversified but dividend-free portfolios from this population, it is questionable whether the aggregate demands of all clienteles seeking to invest in such portfolios could be met, given the substantial dividend concentration that characterizes today's stock market.

If the demand to satisfy heterogeneous clienteles were truly a first-order determinant of dividend policies, we would expect to observe substantial dividend heterogeneity among the prominent firms whose securities are important components of well-diversified portfolios. As long as high tax bracket investors desire to invest substantial amounts of wealth, we should observe a comparably large set of prominent firms that do not pay dividends, and these nonpayers should be spread across a broad spectrum of industries. And, within any given industry, we should see a mix of large dividend-paying and nonpaying firms. What we observe, instead, is (i) few firms with very high earnings fail to pay dividends, (ii) these firms are mainly bunched in a narrow industry sector (technology), and (iii) very large firms in other industries all tend to pay dividends. The fact that the market does not supply a broad spectrum of dividend heterogeneity either across or within industries suggests that pressure to satisfy heterogeneous clienteles is at best a second-order determinant of dividend decisions. It would seem to follow that clientele pressure can have a major impact only in unusual circumstances, for example, when a controlling stockholder's preferences shape a given firm's dividend policy as, e.g., in DeAngelo and DeAngelo (2000).

Our finding that dividends are highly concentrated among a small number of firms with substantial earnings also raises doubts that signaling is a first-order determinant of corporate dividend policy. If managers use dividends to communicate with stockholders, dividend signaling should occur primarily in small, relatively unknown firms with limited access to the financial press, Wall Street analysts, and other conventional information dissemination outlets. But the vast majority of dividends are paid by prominent corporations like Exxon Mobil and General Electric that enjoy major coverage by analysts and journalists—exactly the firms whose managers should have little need to use financial decisions to communicate with investors. How much of aggregate dividends can be motivated by signaling when 92.0% of industrial

dividends are paid by the top 200 dividend payers? While it is possible that signaling motives may be important on the margin for some prominent dividend-paying firms, it is hard to envision plausible scenarios in which a material portion of aggregate dividends reflects signaling motives.

Our evidence on the high and increasing level of dividend concentration adds to a growing body of empirical research that documents major changes in corporate payout practices over the last 25–50 years. Prior studies have identified a number of other important trends, including (i) a marked reduction in the 1970s in the sensitivity of dividends to earnings, as evidenced by a decline in the typical Lintner (1956) speed-of-adjustment coefficient coupled with target payout ratio stability from the late 1940s through at least the mid-1980s (Choe, 1990, 1991), (ii) the virtual disappearance of special dividends in recent years, despite their prominence in the 1950s and earlier (DeAngelo et al., 2000), (iii) a reduction in firms' propensity to pay dividends over the last two decades of the 20th century (Fama and French, 2001a), (iv) the emergence of stock repurchase as a popular payout technique in the 1960s and early 1970s (Dann, 1981; Masulis, 1980; Vermaelen, 1981), and (v) the massive increase in repurchase activity in the mid-1980s (Bagwell and Shoven, 1989; Allen and Michaely, 1995). The interplay of these trends and their possible relation to the high and increasing concentration of earnings documented here are issues that merit future investigation.

Finally, our evidence reveals that publicly traded industrial firms exhibit a two-tier structure based on dollar earnings. The first tier contains a few very high earners, most of which pay dividends, and these firms' dividends collectively dominate the aggregate supply. The second tier contains many firms which, individually and jointly, have modest earnings and which collectively contribute little to the aggregate dividend supply. In essence, the differing behavior of first- and second-tier firms explains why aggregate dividends increased as the number of payers declined over the past two decades. The two-tier structure also raises a possible inconsistency between the findings of Lintner (1956) and Fama and Babiak (1968) and dividend theories in which supply adjustments play a central role. For example, the Black and Scholes' (1974) equilibrium would seem to periodically require material dividend changes by first-tier firms, since second-tier companies' collective dividends are small. But Lintner and Fama and Babiak show that such well-established firms tend to adjust dividends only marginally and then primarily upward in response to their own earnings increases. The interesting empirical question is whether the apparently "sticky" dividend practices of first-tier firms exhibit sufficient variation (in both directions) to provide the supply adjustments critical to the Black and Scholes dividend theory.

The two-tier structure is perhaps *the* signature characteristic that determines the dividend supply of industrial firms, and it has been so for at least two decades (and probably longer). Although our evidence is limited to dividends, we conjecture that the small set of top-tier firms is also responsible for the majority of cash payouts via stock repurchase. Three observations are consistent with this conjecture. First, Fama and French (2001a) report that stock repurchases are primarily the province of dividend-paying firms. Second, earnings are highly concentrated, with a handful of

firms generating the bulk of industrial earnings and dividends, and these firms may also use their earnings to support repurchases. Finally, for S&P 500 firms in the late 1990s, Liang and Sharpe (1999, fig. 1) document substantial gross (as well as net of stock option exercise) dollar repurchase volume, with gross repurchases the same order of magnitude as dividends—facts consistent with our conjecture that top-tier firms dominate aggregate repurchase activity. Whatever the ultimate verdict on the concentration of repurchase volume, future analyses of payout policy should recognize that a few large earners dominate the dividend supply, while the vast majority of firms collectively contributes little to aggregate earnings and dividends.

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