

Global Diversification, Industrial Diversification, and Firm Value

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ABSTRACT

Using a sample of 44,288 firm-years between 1984 and 1997, we document an increase in the extent of global diversification over time. This trend does not reflect a substitution of global for industrial diversification. We also find that global diversification results in average valuation discounts of approximately the same magnitude as those for industrial diversification. Analysis of the changes in excess value associated with changes in diversification reveals that increases in global diversification reduce excess value, while reductions in global diversification increase excess value. These findings support the view that the costs of global diversification outweigh the benefits.

A CONSIDERABLE FRACTION OF U.S. CORPORATIONS diversify their operations, either across multiple lines of business (industrial diversification), across different national markets (global diversification), or both. Over the past decade, an extensive academic literature has developed documenting the causes and consequences of industrial diversification. Studies in this literature report that, on average, diversified firms are valued at a discount relative to a portfolio of comparable, single-segment firms. This value discount appears to stem, in part, from inefficient investment policies. In addition, the evidence indicates a trend towards less industrial diversification since the mid-1980s, as well as a gain in shareholder value associated with refocusing strategies.¹ Because industrial diversification potentially benefits corporate managers through increased power and prestige, through compensation arrange-

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¹ For evidence on the valuation effects of industrial diversification, see Lang and Stulz (1994), Berger and Ofek (1995), and Servaes (1996). Evidence on the investment policies of diversified firms can be found in Scharfstein (1998); Shin and Stulz (1998); Denis and Thothadri (1999); and Rajan, Servaes, and Zingales (2000). For evidence on the trend towards increased corporate focus and the valuation consequences of this increased focus, see Comment and Jarrell (1995).

ments, or through personal risk reduction, a plausible interpretation of the evidence is that industrial diversification represents a cost of the agency relationship that exists between managers and shareholders.²

Considerably less attention has been focused on the causes and consequences of global diversification, and virtually none on the relation, if any, between the two forms of corporate diversification. These issues are interesting for at least three reasons. First, global diversification is quite pervasive. In the broad cross section of U.S. firms that we study, 31 percent of the firm-year observations exhibit some degree of global diversification. This compares with 18 percent of the firm-year observations that exhibit some degree of industrial diversification over the same period. Second, as is the case with industrial diversification, theoretical arguments suggest that global diversification can have both value-enhancing and value-reducing effects. To date, the empirical evidence on the valuation effects of global diversification is somewhat limited and has produced mixed findings. Finally, it is plausible that the increased integration of global economies has changed the relative costs and benefits of industrial and global diversification. While the opening of new markets has increased the feasibility of global diversification, heightened global competition has arguably forced more firms to focus on their core lines of business. This line of argument suggests that global diversification has increased over time and is correlated with the decline in industrial diversification over the same time period. To our knowledge, however, there is little evidence on either time-series trends in global diversification or on correlations between industrial and global diversification.

We provide evidence on trends in global diversification, the correlation between industrial and global diversification, and the valuation consequences of both forms of diversification. Our sample comprises 44,288 firm-year observations of U.S. corporations between 1984 and 1997. We document a substantial increase in the extent of global diversification over the sample time period. Among firms that are in the sample in 1984, the fraction of firms that are globally diversified increases from 0.29 to 0.45. This change is statistically significant at the 0.01 level. In addition, among firms that are globally diversified, the fraction of total sales that comes from foreign operations increases from 0.21 to 0.29 between 1984 and 1997. Again, the difference is significant at the 0.01 level. Thus, the observed increase in the prevalence of global diversification over time stems from both an increase in the fraction of firms operating in multiple national markets, and, conditional on the existence of global diversification, the fraction of total firm sales that are attributable to foreign operations.

² Further support for this interpretation comes from Denis, Denis, and Sarin (1997), who find that (a) diversified firms are characterized by lower managerial equity ownership and lower equity ownership by outside blockholders, and (b) decreases in industrial diversification are often precipitated by market disciplinary forces such as corporate control threats. We discuss alternative interpretations of the evidence in Section IV.

Contrary to the hypothesis that increased global diversification substitutes for industrial diversification, we find no evidence of a negative correlation between the two forms of diversification at the individual firm level. In fact, global diversification is positively correlated with industrial diversification at the firm level. Moreover, firm-year changes in global diversification are positively correlated with changes in industrial diversification. Thus, if anything, the sample firms appear to treat the two forms of diversification as if they are complements rather than substitutes.

Finally, we explore the valuation consequences of global diversification using a variation of the measure of excess value first proposed in Berger and Ofek (1995) and later modified in Bodnar, Tang, and Weintrop (1999). We find that, on average, globally diversified firms trade at a discount relative to a portfolio of single-segment, domestic firms operating in the same industries. Moreover, multivariate analysis reveals that, after controlling for other factors that potentially affect excess value, global diversification is associated with a discount that is similar in magnitude to that associated with industrial diversification. Our point estimates place the discount at 0.20 for firms that are industrially but not globally diversified, 0.18 for firms that are globally but not industrially diversified, and 0.32 for firms that are both industrially and globally diversified. The discount associated with global diversification remains relatively constant over time and is robust to alternative estimation techniques that control for the endogeneity of the diversification decision, alternative measures of value, and alternative benchmarks. Further, we find that increases in global diversification are associated with significant reductions in excess value, while reductions in global diversification are associated with increases in excess value. We thus conclude that global diversification, like industrial diversification, is associated with a reduction in value for the average firm.

The remainder of the paper is organized as follows. Section I outlines the theoretical costs and benefits of global diversification and reviews the existing empirical evidence. We also develop hypotheses for the relation between industrial and global diversification. Section II describes our sample selection process and measures of diversification and reports some descriptive statistics. Section III presents our primary empirical results. Section IV discusses the interpretation of our findings in the context of similar findings in the industrial diversification literature. Section V concludes.

I. Theory and Prior Evidence on Global Diversification

Theoretical arguments suggest that global diversification can have both positive and negative effects on firm value. In addition, the relative costs and benefits of global diversification have, in theory, changed over time. In this section, we review the theoretical arguments on these issues and discuss the related empirical evidence.

A. Potential Costs and Benefits

Previous authors hypothesize that global diversification enhances shareholder value by exploiting firm-specific assets, by increasing operating flexibility, and by satisfying investor preferences for holding globally diversified portfolios.

Morck and Yeung (1998) propose that the value of diversification has its roots in the internalization theory of synergy, proposed initially by Caves (1971). According to this theory, synergistic benefits stem from the existence of valuable information-based assets within the firm. Because these assets have increasing returns to scale and are difficult to sell, it is optimal for firms possessing information-based assets to internalize the markets for these assets. Global diversification can be viewed as one mechanism for bringing buyers and sellers of information-based assets together within the same firm. According to this view, therefore, global diversification increases value in the presence of substantial intangible assets, such as superior production skills, marketing skills, and management quality.

Global diversification might also increase value by creating the flexibility within the firm to respond to changes in relative prices, differences in tax codes, and other institutional differences. For example, a multinational firm has the flexibility to shift production to the country in which production costs are lowest, or shift distribution to the country in which market demand is highest. This argument is similar to Stein's (1997) "winner-picking" model of investment decisions in industrially diversified firms. Similarly, the multinational firm has the ability to lower the firm's overall tax liability by exploiting differences in tax systems across countries, and, assuming some degree of market segmentation, can choose to raise capital in the country in which the costs of doing so are lowest.

Finally, the benefits of global diversification can arise from investors' diversification preferences. To the extent that corporations can diversify internationally at a lower cost than can individuals, investors will be willing to pay a premium for globally diversified firms, *ceteris paribus*.

There are equally plausible reasons to believe that global diversification will reduce shareholder wealth. A globally diversified organization is more complex than a purely domestic firm. This complexity can lead to high costs of coordinating corporate policies. Harris, Kreibel, and Raviv (1982) and Myerson (1982) discuss costs of information asymmetry between corporate headquarters and divisional managers in multisegment organizations. In addition, Bodnar et al. (1999) hypothesize that the monitoring of managerial decision making can be more difficult in a complex, globally diversified firm.

As is the case with industrial diversification, global diversification can also lead to the inefficient cross-subsidization of less profitable business units. Meyer, Milgrom, and Roberts (1992), Rajan and Zingales (1995), Rajan et al. (2000), and Scharfstein and Stein (2000) present models in which divisional managers exert influence to increase the assets under their control. This

leads, in some cases, to less profitable divisions being subsidized by, and at the expense of, more profitable divisions.

It is worth noting again that managers may have the incentive to adopt and maintain value-reducing diversification strategies, even if doing so reduces shareholder wealth. Managers can benefit from global diversification in at least three ways. First, managing a large, multinational corporation confers greater power and prestige on the manager (see, e.g., Jensen (1986) and Stulz (1990)). Second, levels of managerial compensation tend, on average, to be positively correlated with firm size (see, e.g., Jensen and Murphy (1990)). Third, to the extent that the cash flows of global segments are imperfectly correlated, global diversification reduces the risk of the manager's relatively undiversified personal portfolio (see, e.g., Amihud and Lev (1981)). If these private benefits exceed the manager's private costs, the firm may pursue value-reducing global diversification.

B. Trends in Diversification over Time

Prior evidence suggests that the degree of industrial diversification has been decreasing over time (Comment and Jarrell (1995)). Several possible reasons for this trend have been proposed. Shleifer and Vishny (1991) argue that the relaxation of antitrust enforcement in the early 1980s allowed firms to focus more on their core line of business, thereby diminishing the value of industrial diversification. Liebeskind and Opler (1994) suggest that increased focus on core lines of business may have been necessitated by increases in global competition. Yet another view is that decreases in industrial diversification represent forced reversals of prior diversification mistakes (see, e.g., Jensen (1993)). Under this view, the active market for corporate control in the 1980s and enhanced corporate governance practices have limited the ability of managers to pursue value-reducing industrial diversification strategies.

To our knowledge, there has been no similar evidence regarding trends in global diversification. The increased integration of world product markets over time has made global diversification more feasible. *Ceteris paribus*, this suggests that we should observe increases in global diversification over time. In addition, the aforementioned reductions in industrial diversification may have freed managerial time and attention to be focused on global diversification. This suggests not only an increase in global diversification, but also a negative correlation between changes in industrial and global diversification over time.

Recall that one argument for why global diversification can be value increasing is that corporations can diversify internationally at a lower cost than can individual investors, thereby providing those investors with valuable portfolio diversification. As world capital markets have become increasingly integrated, the cost of international portfolio diversification has arguably been reduced for investors. This effect predicts a decrease in the value of global diversification over time.

Finally, as we discussed earlier, it is possible that the decision to diversify globally is made for managerial reasons. Managers can achieve many of the same private benefits with global diversification that they can with industrial diversification. The implications of this for the trend in global diversification over time are unclear. If global diversification is recognized as value reducing, on average, we would expect the same corporate governance factors that have led to decreases in industrial diversification to force similar decreases in global diversification. On the other hand, if global diversification is value increasing, or if the fact that it is value reducing is not yet well understood, we might observe an increase in global diversification over time as global diversification becomes more feasible. Furthermore, we would expect a negative correlation between changes in industrial and global diversification, as managers substitute global diversification for the industrial diversification they were forced to reduce.

C. Prior Empirical Evidence

Several prior studies have examined the valuation effects of global diversification and have produced mixed results. Using samples of multinational firms only, Errunza and Senbet (1981, 1984) document a positive relation between their measure of excess firm value and the firm's degree of internationalization. They interpret their findings as evidence that global diversification completes the market for investors who otherwise face barriers to international capital flows. Like Errunza and Senbet (1981, 1984), Morck and Yeung (1991) document a positive relation between firm value and internationalization. However, Morck and Yeung find that this positive association is present only for those firms with firm-specific intangible assets. Thus, they interpret their findings as support for the view that global diversification enhances firm value because it allows firms to exploit their firm-specific skills on a global level.

One drawback to these earlier studies is that they employ relatively small samples of firms from the 1970s. As we argued earlier, it is likely that the valuation consequences of global diversification have changed over time due to the integration of global capital and product markets. Using a slightly more recent time period and focusing on the effects of exchange rate volatility, Christophe (1997) finds that multinational firms have lower Tobin's q ratios than domestic firms. However, his study is still limited to the 1978 to 1984 period, it does not control for industrial diversification, and it does not compare the qs of multinational firms with those of domestic firms operating in the same industry. Hence, the valuation effects of global diversification over the last two decades remains an unresolved issue.

We address this issue by studying a large sample of firms from the 1980s and 1990s and employing a methodology that (a) compares the value of globally diversified firms with that of comparable single-segment, domestic firms operating in the same industries, and (b) controls for other determinants of value (including industrial diversification). In addition, we examine trends

in global diversification over time and the correlation between global diversification and industrial diversification. As noted earlier, there is, to our knowledge, no evidence on these latter two issues.

Three contemporaneous working papers also examine the valuation effects of global diversification and produce mixed results. Like us, Christophe and Pfeiffer (1998) and Click and Harrison (2000) find that multinational companies are valued at a discount relative to domestic companies. However, neither study attempts to compare the value of the multinational firm to a portfolio of single-segment firms operating in the same industry. Using a valuation methodology similar to ours, Bodnar et al. (1999) find that global diversification is associated with higher firm value.

II. Sample Selection and Diversification Measures

A. Sample Selection

Beginning in 1977, U.S. firms are required to report audited financial information for individual industrial and foreign segments that account for more than 10 percent of consolidated sales, profits, or assets. Compustat reports this information on its Industry Segment and Geographic Segment tapes.³ The accounting data that is available by segment on each tape are sales; operating profit; depreciation, depletion, and amortization; capital expenditures; and identifiable assets.

In each year from 1984 through 1997, we identify all firms for which there is data on both the Industry Segment and the Geographic Segment tapes. We eliminate utility and financial firms (SIC codes 4900–4999 and 6000–6999, respectively) and firms incorporated outside of the United States. We also eliminate firm-years in which any industrial segment has sales less than \$20 million and firm-years in which the total of either industrial or global segment sales is not within one percent of total reported firm sales for that year.⁴ This results in a sample of 44,288 firm-years associated with 7,520 firms.

Table I reports descriptive statistics on various diversification measures for the overall sample and for the subsamples that are industrially and globally diversified. We report three different measures of industrial diversification: the reporting of more than one business segment, the average number of business segments, and a sales-based Herfindahl index. In 18 percent of the sample firm-years, more than one industrial segment is reported, that

³ *Compustat* defines geographic segments based upon operations at the country level. Authors of prior research on diversification across countries also frequently term such diversification to be “geographic.” However, because “geographic” diversification could also suggest diversification across regions of a country, we prefer to use the term “global” diversification.

⁴ These sales-related requirements are associated with the calculation of the excess value measures that will be utilized in the paper. The requirement that all industrial segments have sales of at least \$20 million avoids the problem of comparing very small segments to much larger single-segment firms. The requirement that segment sales total within one percent of total firm sales ensures that all firm sales have been allocated to individual business and global segments.

Table I
Measures of Global and Industrial Diversification

Mean and median measures of industrial and global diversification for 44,288 firm-years over the period 1984–1997.

	All Firm-Years (<i>n</i> = 44,288)		Industrially Diversified (<i>n</i> = 7,905)		Globally Diversified (<i>n</i> = 13,530)	
	Mean	Median	Mean	Median	Mean	Median
Industrial diversification						
Fraction of firm-years industrially diversified	0.178	N.A. ^a	1.000	N.A.	0.290	N.A.
Number of segments	1.331	1.000	2.853	3.000	1.583	1.000
Sales-based Herfindahl index	0.915	1.000	0.526	0.516	0.856	1.000
Global diversification						
Fraction of firm-years globally diversified	0.306	N.A.	0.496	N.A.	1.000	N.A.
Fraction foreign sales	0.084	0.000	0.123	0.000	0.274	0.230

^a N.A.: Not applicable.

is, the firm is industrially diversified in that year. Among the subsample of firm-years that are globally diversified, 29 percent are also industrially diversified. The average number of industrial segments is 1.33 overall, 2.85 among industrially diversified firm-years, and 1.58 among globally diversified firm-years. It should be noted that Compustat limits the number of industrial segments to 10; however, there are only 11 firm-years in which 10 industrial segments are reported. Finally, the average sales-based Herfindahl index is 0.92 overall, 0.53 among industrially diversified firms, and 0.86 among globally diversified firms.

Global segment data provided by Compustat are much less detailed than industrial segment data. There is no requirement by either the Financial Accounting Standards Board (FASB) or the Securities and Exchange Commission (SEC) regarding groupings for geographic areas. Consequently, two companies operating in the same countries might report their operations very differently.⁵ Moreover, Compustat limits the number of global segments to four, including the domestic segment, that is, no more than three foreign segments are reported for any firm, regardless of the number of countries in which it operates. Compustat first classifies the actual global segments reported by the firm into one of seven geographic regions. They then aggregate

⁵ According to FASB 14, "For purposes of this Statement, foreign geographic areas are individual countries or groups of countries as may be determined to be appropriate in an enterprise's particular circumstances. No single method of grouping the countries in which an enterprise operates into the geographic areas can reflect all of the differences among international business environments. Each enterprise shall group its foreign operations on the basis of the differences that are most important in its particular circumstances."

gate these regions as necessary to fit the arbitrary limit of four global segments. Thus, an individual segment reported on Compustat might represent a single country, or it might represent a very broad geographic region.

Given these limitations, the number of global segments in which a firm operates has limited meaning and we do not report it as a measure of global diversification. In addition, because the database does not specify the individual countries that are included in each segment, we are unable to use the number of countries as a measure of global diversification.

Table I reports summary statistics for two measures of global diversification: the fraction of firms that are globally diversified and the fraction of total sales that comes from foreign subsidiaries.⁶ We classify a firm as globally diversified if it reports any sales by foreign subsidiaries.⁷ Thirty-one percent of the sample firm-years are globally diversified; among the subsample of firm-years that are industrially diversified, this rises to 50 percent. The average firm in the average year derives 8 percent of its sales from foreign operations; for industrially diversified firms, the corresponding figure is 12 percent. Among firms that are globally diversified, foreign sales average 27 percent of total annual sales.⁸

In Table II, we report descriptive statistics on several firm characteristics. We partition the sample firm-years into four subsamples on the basis of whether the firm is globally or industrially diversified in that year. Firms are classified as multisegment if they report more than one segment on

⁶ Note that export sales by the domestic subsidiary are not treated as foreign sales. As is the convention in the literature, we distinguish those situations in which a company actually has foreign operations from those in which a company simply sells its products in a different market. The former is more pertinent to the issue of diversification because it represents situations in which a company has expanded the boundaries of the firm by substituting managerial control of assets for market transactions. We thank the editor for helping to clarify this point. We examine the robustness of our findings to the inclusion of export sales in Section III.C.6.

⁷ An alternative means of identifying globally diversified firms is to utilize footnote information on income tax expense. The SEC requires firms to make a separate disclosure of pretax income, current taxes, and deferred taxes for U.S. and non-U.S. operations if any of the three measures account for more than five percent of the firm's consolidated total (see Bodnar and Weintrop (1997) for further details). Using this information would potentially allow us to identify firms with smaller foreign operation than we identify using the Geographic Segment File. However, this additional sample would be biased towards more successful foreign operations, since the alternative measure is based on income and tax measures rather than assets and sales. Hence, we do not use the footnote information to identify globally diversified firms. An ancillary benefit of our approach is that our identification of globally diversified firms is then consistent with the manner in which we identify industrially diversified firms.

⁸ Compustat reports sales for each of the four global segments, as well as total foreign sales. However, there are 1,617 firm-years for which the global segment that includes the domestic operations also includes some foreign operations. Compustat reports total foreign sales for these firms as missing because it cannot isolate foreign from domestic sales in that one segment. We adjust total foreign sales for these firms to equal the sum of sales in the three segments that do not include any domestic operations. By doing so, we appropriately label these 1,617 firms as globally diversified. Their foreign sales, however, will be understated by the amount of foreign sales that is included with the domestic segment. Our results are qualitatively identical if we exclude these 1,617 firm-years.

Table II
Firm Characteristics

Descriptive statistics on various firm characteristics for the sample of 44,288 firm-year observations over the period 1984–1997. The sample is partitioned into four groups on the basis of whether the firm is industrially or globally diversified in the given firm-year. Firms are classified as multisegment (i.e., industrially diversified) if they report more than one business segment on Compustat's Industry Segment File. Firms are classified as multinational (i.e., globally diversified) if Compustat's Geographic Segment File reports any foreign sales for the firm. R&D and advertising expenses are set to zero if missing. Market value of total capital is defined as the market value of equity plus the book value of total assets minus the book value of equity. Means are reported with median values in italics below.

Firm Characteristic	Single-segment Domestic	Multisegment Domestic	Single-segment Multinational	Multisegment Multinational
Market value of total capital (\$mill.)	672.385 <i>125.974</i>	1801.495 <i>456.303</i>	1526.708 <i>258.654</i>	4784.908 <i>1427.741</i>
Long-term debt/ total assets	0.162 <i>0.111</i>	0.193 <i>0.169</i>	0.116 <i>0.063</i>	0.163 <i>0.139</i>
EBIT/sales	0.122 <i>0.097</i>	0.119 <i>0.099</i>	0.121 <i>0.120</i>	0.136 <i>0.125</i>
Capital expenditures/ sales	0.097 <i>0.038</i>	0.068 <i>0.038</i>	0.072 <i>0.043</i>	0.064 <i>0.046</i>
R&D/sales	0.022 <i>0.000</i>	0.006 <i>0.000</i>	0.054 <i>0.023</i>	0.021 <i>0.011</i>
Advertising/sales	0.012 <i>0.000</i>	0.010 <i>0.000</i>	0.015 <i>0.000</i>	0.015 <i>0.000</i>

Compustat's Industry Segment File and are classified as multinational if they report any foreign sales on Compustat's Geographic Segment File. Not surprisingly, multisegment, multinational firms are the largest firms, with a median market value of total capital three times that of any of the other subsamples. Single-segment, multinational firms have lower leverage and invest more in research and development (R&D) and advertising.⁹ Multinational firms (both single-segment and multisegment) also have higher median capital expenditures. We later control for these differences in characteristics when estimating the valuation effects of the different forms of diversification.

B. Diversification Trends

One purpose of this study is to document trends in diversification among U.S. corporations. In Table III, we document industrial and global diversification measures by calendar year. Panel A presents results for the sample as a whole. The fraction of the sample firms that are industrially diversified

⁹ We set R&D and advertising expenditures to zero when there are missing values. However, our qualitative conclusions are not sensitive to this choice.

Table III
Average Annual Industrial and Global Diversification Measures

The sample includes 44,288 firm-years over the period 1984–1997. The number of industrial segments and Herfindahl measures are for the subsample of firms that are industrially diversified. The fraction foreign sales measure is for the subsample of firms that are globally diversified. The 1984 sample includes those firms for which there is Compustat data available in 1984. We then follow this set of firms between 1984 and 1997.

Year	N	Fraction Industrially Diversified	Industrially Diversified Firm-Years Only		Fraction Globally Diversified	Globally Diversified Firm-Years Only
			Number of Industrial Segments	Sales-based Herfindahl		Fraction Foreign Sales
Panel A: Full Sample						
1984	2,356	0.263	3.176	0.486	0.292	0.211
1985	2,522	0.244	3.110	0.497	0.284	0.220
1986	2,643	0.233	2.992	0.506	0.288	0.242
1987	2,771	0.216	2.940	0.512	0.287	0.256
1988	2,752	0.207	2.907	0.525	0.289	0.271
1989	2,749	0.199	2.875	0.528	0.293	0.277
1990	2,807	0.192	2.846	0.533	0.300	0.291
1991	2,925	0.182	2.765	0.536	0.304	0.280
1992	3,161	0.170	2.784	0.537	0.308	0.284
1993	3,391	0.161	2.744	0.537	0.302	0.278
1994	3,658	0.150	2.717	0.538	0.312	0.274
1995	4,084	0.138	2.706	0.542	0.319	0.291
1996	4,259	0.130	2.656	0.549	0.331	0.295
1997	4,210	0.123	2.606	0.557	0.329	0.296
Panel B: 1984 Sample						
1984	2,356	0.263	3.176	0.486	0.292	0.211
1985	2,059	0.254	3.134	0.494	0.303	0.215
1986	1,872	0.256	3.031	0.504	0.324	0.240
1987	1,719	0.250	3.016	0.506	0.338	0.251
1988	1,568	0.250	2.954	0.517	0.344	0.272
1989	1,421	0.253	2.919	0.523	0.353	0.278
1990	1,337	0.258	2.948	0.529	0.361	0.293
1991	1,275	0.260	2.870	0.534	0.372	0.287
1992	1,227	0.264	2.895	0.532	0.394	0.288
1993	1,180	0.264	2.836	0.536	0.401	0.289
1994	1,131	0.261	2.820	0.540	0.409	0.288
1995	1,063	0.262	2.860	0.538	0.427	0.301
1996	1,022	0.267	2.795	0.541	0.443	0.299
1997	940	0.256	2.759	0.543	0.449	0.291

declines steadily over the period, from 0.26 in 1984 to 0.12 in 1997. Furthermore, the degree of diversification observed among those firms that are industrially diversified also declines over the period. The average industrially

diversified firm in 1984 has 3.18 segments, while the average industrially diversified firm in 1997 has only 2.61 segments. The decline is steady and monotonic, with the exception of a small increase in the average number of segments in 1992. The sales-based Herfindahl index increases from 0.49 to 0.56 over the period, again consistent with a decrease in the degree of industrial diversification. For all three industrial diversification measures, the change from 1984 to 1997 is significant at the 0.01 level. These results confirm and extend those of Comment and Jarrell (1995), who document increases in industrial focus over the 1978 to 1989 time period.

The Panel A results for global diversification measures suggest a modest trend towards increased global diversification. The fraction of sample firms that are globally diversified increases over the sample period from 0.29 in 1984 to 0.33 in 1997. Among those firms that are globally diversified, the fraction of sales that comes from their foreign operations increases over time, on average, from 0.21 in 1984 to 0.30 in 1997. The change over the whole period is significant at the 0.01 level.

The Panel A results could be somewhat misleading. The increasing number of firms indicates a net addition of firms over time. If new firms are less likely to be either industrially or globally diversified than those firms already in the sample, there will be a bias towards reductions in average diversification over time even if individual firms are not altering their diversification status. To avoid this bias, we examine those firms that are in the sample in 1984. We follow the diversification status of this subsample from 1984 to 1997, allowing firms to exit the subsample, but not allowing any new firms to enter the subsample. We label this the 1984 sample.

The results for this subsample, reported in Panel B, indicate that the fraction of firms that are industrially diversified declines from 0.263 in 1984 to 0.256 in 1997; this decline is statistically insignificant. In contrast, there is a pronounced and statistically significant (at the 0.01 level) increase in the fraction of firms that are globally diversified in this subsample: from 0.29 to 0.45. The Panel B results with respect to the degree of diversification are essentially the same as those in Panel A. The degree of industrial diversification declines significantly over the sample period, while the degree of global diversification increases significantly.¹⁰

C. The Relation between Global and Industrial Diversification

The results of the previous subsection establish that there is a decline in the degree of industrial diversification and an increase in the degree of global diversification over the sample period. As discussed earlier, there are at least two reasons to think that these trends could be related at the firm level. First, the increased feasibility of global diversification might lead firms to substitute global for industrial diversification, perhaps because resources

¹⁰ We also examine, but do not report separately in the table, a subsample of firms that are in the sample in both 1984 and 1997. The trends in diversification for this "constant composition" subsample are qualitatively similar to those in Panel B.

Table IV
Correlations among Measures of Global and Industrial Diversification

The sample includes 44,288 firm-years between 1984 and 1997. Panel A presents the average of the time-series correlation between firm-year levels of global and industrial diversification, Panel B presents correlations among changes in diversification in individual firm-years, and Panel C presents correlations among changes in diversification between 1984 and 1997 for the subsample of firms that are included in the sample in both 1984 and 1997.

Panel A: Time-series Correlation between Firm-Year Levels of Global and Industrial Diversification		
	Multisegment Dummy	Number of Segments
Global dummy	0.309***	0.203***
% foreign sales	0.055	-0.014
Panel B: Correlations between Firm-Year Changes in Global and Industrial Diversification		
	Δ Multisegment Dummy	Δ Number of Segments
Δ Global dummy	0.059***	0.064***
Δ % foreign sales	0.017***	0.020***
Panel C: Correlations Between Changes in Global and Industrial Diversification between 1984 and 1997		
	Δ Multisegment Dummy	Δ Number of Segments
Δ Global dummy	0.070**	0.074**
Δ % foreign sales	0.030	0.028

***, ** Significant at the 0.01 and 0.05 levels, respectively.

limit the ability to pursue both and/or because global competitiveness is enhanced by greater focus on an industrial core. Second, if industrial and global diversification provide similar private benefits to managers, and if industrial diversification has fallen out of favor, managers may substitute global for industrial diversification over time.

Table IV presents a variety of correlations between global and industrial diversification. In Panel A, we compute the time-series correlation between industrial and global diversification for each firm, then report the average of this correlation across firms. The results suggest that industrial and global diversification are, if anything, positively correlated, that is, those firms that are globally diversified are more likely to be industrially diversified as well.¹¹

¹¹ In unreported results, we do find that, among firms that are globally diversified, there is a significant negative correlation between the percentage of sales from foreign segments and both measures of industrial diversification. In other words, among those firms that are globally diversified, the degree of global diversification is higher in firms that are less industrially diversified.

Panel B presents correlations between firm-year changes in the measures of diversification. Once again, the correlations are positive. Firms that increase (decrease) global diversification are more likely to increase (decrease) industrial diversification.

Finally, Panel C of Table IV presents correlations between changes in the measures of diversification between 1984 and 1997 for the subsample of firms that are in the sample in both 1984 and 1997. These correlations are again positive and are significant in some cases. Overall, therefore, our findings in Table IV provide no evidence that increases in global diversification over time are due to a substitution of global for industrial diversification by individual firms.

III. The Valuation Effects of Diversification

A. Univariate Results

We measure the valuation effects of diversification using a variation of the excess value measure originally developed by Berger and Ofek (1995) and modified by Bodnar et al. (1999). We compute the percentage difference between a firm's value of total capital (market value of equity plus book value of total assets minus book value of common equity) and the sum of the imputed values of its industrial segments as stand-alone domestic firms. Imputed segment values are calculated by multiplying the median ratio, for single-segment, purely domestic firms in the same industry and the same year, of total capital to sales by the level of sales for the segment. The industry median ratios are based on the narrowest SIC grouping that yields five single-segment domestic firms that have at least \$20 million in revenue, and for which we have the data necessary to compute ratios.¹² We sum these imputed values across the segments within the firm to obtain an estimated imputed value for the entire firm. Excess value is measured as the log of the ratio of the firm's actual value to its imputed value. Like Berger and Ofek (1995), we exclude "extreme" excess values, defined as those observations for which the firm's actual value is either more than four times its imputed value or less than one-fourth its imputed value.

Table V presents excess value measures for a variety of subsamples defined by diversification status. Overall, global diversification is associated with reduced value. The average (median) excess value for globally diversified firms is -0.034 (-0.047). Both mean and median excess values are significantly different from zero at the 0.01 level. Moreover, both the aver-

¹² Imputed values are calculated using four-digit SIC codes for 47.5 percent of the sample segment-years, three-digit codes for 23.3 percent of the sample segment-years, and two-digit codes for 26.0 percent of the sample segment-years. For 3.2 percent of the sample segment-years, we are unable to calculate an excess value. The end result of these segments for which we are unable to obtain a five-firm comparison sample, along with missing data and extreme outliers, is that we are able to calculate excess values for only 34,200 of the original 44,288 firm-years.

Table V
Excess Value Measures for a Sample of 34,200 Firm-Years
between 1984 and 1997

From the original sample of 44,288 firm-years, we exclude those for which there is insufficient data to calculate excess value. We also exclude outlier observations, defined as those observations for which actual value is either more than four times imputed value or less than one-fourth imputed value. Excess value is measured as the log of the ratio of the firm's total market value to the sum of the imputed market values of its segments. Imputed segment values are calculated by multiplying the median ratio of total capital to sales for single-segment domestic firms in the same industry times the level of sales for the individual segment. Means are reported above medians, with the number of observations in parentheses below. The sample is partitioned by whether or not the firm is industrially diversified, and whether or not the firm is globally diversified in a given firm-year. Firms are classified as multisegment (i.e., industrially diversified) if they report more than one business segment on Compustat's Industry Segment File and as single-segment otherwise. Firms are classified as multinational (i.e., globally diversified) if Compustat's Geographic Segment File reports any foreign sales for the firm and as domestic otherwise. Significance of means and medians are measured using a standard two-tailed *t*-test and a two-tailed Wilcoxon signed rank test, respectively.

	Single-segment	Multisegment	All
Domestic only	-0.000	-0.059***	-0.007**
	0.000 (<i>n</i> = 20,278)	-0.057*** (<i>n</i> = 2,881)	0.000*** (<i>n</i> = 23,159)
Multinational	-0.049***	0.008	-0.034***
	-0.064*** (<i>n</i> = 8,193)	-0.010 (<i>n</i> = 2,848)	-0.047*** (<i>n</i> = 11,041)
All	-0.014***	-0.026***	
	0.003*** (<i>n</i> = 28,471)	-0.035*** (<i>n</i> = 5,729)	

***, ** Significant at the 0.01 and 0.05 levels, respectively.

age and median excess values of globally diversified firms differ significantly from those of firms that are not globally diversified (significance not denoted in the table).

Table V also documents excess values for firms that are and are not industrially diversified. We find that multisegment firms exhibit significantly negative excess values. Industrial diversification is associated with an average (median) excess value of -0.026 (-0.035). These values differ significantly from zero at the 0.01 level. However, the magnitude of the discount for industrial diversification is smaller than in Berger and Ofek (1995) and Lang and Stulz (1994), who find discounts in the 10 percent to 15 percent range.

Because we are interested in the relation between global and industrial diversification, we break the full sample into four subsamples: firm-years that are neither globally nor industrially diversified (domestic, single-segment), firm-years that are both globally and industrially diversified (multinational, multisegment), firm-years that are only globally diversified (multinational, single-segment), and firm-years that are only industrially diversified (domestic, multisegment). This further refinement yields surpris-

ing results. While being either multinational or multisegment (but not both) is associated with significant negative excess value, excess values are statistically insignificant for the multinational, multisegment firms. Although these findings suggest the possibility of some interaction between global and industrial diversification, recall from Table II that there are systematic differences in the characteristics of the firms comprising the four subsamples. To the extent that these other characteristics are correlated with excess value, it is important to control for them in a multivariate framework.

B. Multivariate Regression Results

To provide multivariate evidence on the valuation effects of the different types of diversification, we estimate ordinary least squares regressions of excess value on three dummy variables denoting: (a) firms that are industrially but not globally diversified, (b) firms that are globally but not industrially diversified, and (c) firms that are both industrially and globally diversified. Thus, the regression coefficients on the dummy variables represent the difference in excess value between the firms in each diversification category and the excess values of single-segment, domestic firms.

In addition, we control for other possible determinants of excess value, including firm size, measured as the market value of total capital, the ratio of long-term debt to the market value of total capital, the ratio of capital expenditures to sales, the ratio of earnings before interest and taxes (EBIT) to sales, the ratio of research and development expenditures to sales, and the ratio of advertising expenditures to sales.¹³ Because excess values are measured relative to single-segment domestic firms, we compute relative measures of all independent variables as the difference between the value for the firm and the median value for the domestic single segment firms operating in the same primary industry.¹⁴ As with excess values, industry median values are based on the narrowest SIC grouping that has at least five single-segment domestic firms that have at least \$20 million in revenue. Where there are missing observations for R&D expenditures or advertising expenditures, we set the missing values to zero. Our results are not sensitive to this choice, however. We obtain similar results if we exclude all observations with missing data.

¹³ Following Morck and Yeung (1991), we also interact the advertising and R&D variables with the percent of sales coming from foreign subsidiaries. Unlike Morck and Yeung, we find no evidence that the value of global diversification increases with R&D and advertising expenditures. Moreover, including these interaction terms has virtually no impact on the coefficients of the other independent variables.

¹⁴ Bodnar et al. (1999) use a similar approach. Because of the skewness in the firm size variable, we use the log of the ratio of firm value to the weighted average median firm value of single segment firms. We also estimate all of the multivariate regressions using raw values of the independent variables. Doing so substantially reduces the explanatory power of the regressions: the adjusted *r*-squared drops from 0.27 to 0.09. Our qualitative conclusions are not affected by this choice, but the magnitude of the discount for global diversification is reduced to 0.09, and the discount for firms that are both industrially and globally diversified is reduced to 0.03. Both are significant at the 0.01 level.

Table VI
Multivariate Regression Tests

Ordinary least squares regressions of excess value on dummy variables denoting industrial and global diversification, and a set of control variables. Excess value is measured as the log of the ratio of the firm's total market value to the sum of the imputed market values of its segments. Imputed segment values are calculated by multiplying the median ratio of total capital to sales for single-segment domestic firms in the same industry times the level of sales for the individual segment. A firm is industrially diversified if it reports more than one industrial business segment. Likewise, a firm is globally diversified if Compustat's Geographic Segment File reports any foreign sales for the firm. All control variables are measured as deviations from the median value for domestic single-segment firms in the same industry. The sample includes 34,200 firm-year observations over the period 1984–1997. Coefficient estimates are reported with *t*-statistics in parentheses below. Results are reported for the full sample of firm-years, the subperiods of 1984–1988, 1989–1993, and 1994–1997.

Independent Variables	Full Sample	1984–1988	1989–1993	1994–1997
Intercept	0.002 (0.65)	0.014 (2.26)	0.012 (2.12)	-0.014 (-2.45)
Dummy equal to one if only industrially diversified	-0.204 (-21.67)	-0.245 (-16.20)	-0.190 (-11.91)	-0.166 (-9.10)
Dummy equal to one if only globally diversified	-0.182 (-29.04)	-0.181 (-15.29)	-0.169 (-15.88)	-0.184 (-18.05)
Dummy equal to one if both industrially and globally diversified	-0.322 (-31.27)	-0.393 (-22.82)	-0.284 (-15.91)	-0.276 (-15.13)
Relative market value of total capital	0.127 (67.45)	0.119 (34.06)	0.123 (38.08)	0.134 (43.26)
Relative long-term debt to total capital	-0.409 (-23.99)	-0.235 (-7.58)	-0.492 (-18.09)	-0.468 (-15.54)
Relative capital expenditures to sales	0.415 (26.10)	0.356 (12.55)	0.315 (9.46)	0.486 (20.53)
Relative EBIT to sales	1.041 (46.09)	0.885 (23.42)	1.394 (30.98)	0.997 (27.54)
Relative R&D to sales	1.278 (32.17)	1.333 (12.05)	0.920 (11.37)	1.387 (26.38)
Relative advertising to sales	0.004 (0.05)	0.326 (2.25)	-0.045 (-0.32)	-0.192 (-1.38)
Adjusted R^2	0.267	0.231	0.291	0.283
Number of observations	33,478	9,793	10,942	12,473

In the first column of Table VI, we report the results for the full sample of 34,200 firm-year observations. The multivariate regressions indicate that excess values are significantly lower for firms that are industrially or globally diversified than they are for single-segment, domestic firms. The multivariate results suggest, however, that these discounts are of larger magnitude than those suggested by the univariate results. Point estimates from Table VI place the diversification discounts at 0.20 for industrial diversification and 0.18 for global diversification.

The Table VI point estimate of the diversification discount for firms that are both globally and industrially diversified is 0.32. This discount is significantly larger (at the 0.01 level) than the discounts associated with being either industrially or globally diversified, but not both. This result stands in stark contrast to the Table V univariate result, in which firms that are both globally and industrially diversified do not exhibit any diversification discount, on average. The multivariate result suggests that the insignificant average excess values observed for firms that engage in both types of diversification are due to factors other than their being diversified. The marginal valuation effect of being both globally and industrially diversified is significantly negative.

The coefficient estimates for the other control variables are similar to those documented in prior studies. Excess values are positively related to relative firm size, capital expenditures, EBIT, R&D, and advertising expenditures, and negatively related to the ratio of long-term debt to total assets.¹⁵

C. Sensitivity and Robustness Tests

In this section, we report the results of a battery of sensitivity and robustness checks. In short, these tests indicate that the discount associated with global diversification remains fairly constant over time and is robust to alternative estimation techniques, the use of alternative single-segment benchmark firms, alternative valuation measures, alternative industry definitions, and alternative definitions of global diversification.

C.1. Robustness over Time

In columns 2–4 of Table VI, we examine the robustness of our estimates over time by estimating the cross-sectional regressions for each of the three subperiods, 1984 to 1988, 1989 to 1993, and 1994 to 1997. The results indicate that the discount associated with global diversification has remained relatively stable over time. The subperiod diversification coefficients are all highly significant.¹⁶

By contrast, point estimates of the value discounts associated with industrial diversification decline over time, from 0.25 in the first subperiod to 0.17 in the last subperiod. Similarly, the discount for being both globally and industrially diversified declines over time, from 0.39 in the first subperiod

¹⁵ Diagnostic tests indicate that multicollinearity is not a serious problem. There are no variance inflation factors that exceed 1.5 in any of the regressions.

¹⁶ Christophe (1997) argues that the benefits of global diversification will be reduced during periods of high exchange rate volatility. Consistent with that argument, he finds significantly lower valuation effects of global diversification in the 1980s, a period of high exchange rate volatility, than in the 1970s, a period of lower exchange rate volatility. However, Christophe and Pfeiffer (1998) find that global diversification continues to reduce value in the 1990s, when exchange rate volatility was relatively low. Our results confirm the stability of the discount associated with global diversification over the period of the 1980s and 1990s. Collectively, these results suggest that exchange rate volatility has little impact on the valuation effects of global diversification.

to 0.28 in the last subperiod. These declines are consistent with the overall reduction in industrial diversification over time. Denis et al. (1997) find that the likelihood of refocusing is greater among those diversified firms with lower excess values. As the firms with the lowest excess values have refocused over time, the remaining diversified firms exhibit higher (i.e., less negative) excess values.

C.2. Alternative Estimation Techniques

The pooling of cross-sectional and time-series data in our tests creates a lack of independence in the regression models. This results in deflated standard errors and, therefore, inflated *t*-statistics. To address the importance of this bias, we estimate the regression models separately for each of the 14 calendar years in our sample. We then average the coefficient estimates across the 14 years and compute *t*-statistics of these average coefficients based on the standard deviation of these annual estimates. The results of this test, reported in the first column of Table VII, are similar to our previous findings. Excess values are negatively related to industrial diversification, to global diversification, and to the combination of the two types of diversification. The coefficients and statistical significance of the other control variables are similar to those in the pooled cross-sectional, time-series data.

A related concern is that firm value and the decision to diversify are endogenously related in some way. In other words, firm value and the decision to diversify could be driven by common firm-specific factors. To address this issue, model (2) of Table VII reports estimates of a multivariate regression with firm fixed effects. Although the inclusion of fixed effects substantially increases the explanatory power of the regression, our findings are robust. Excess values continue to be negatively related to industrial diversification, to global diversification, and to the combination of the two types of diversification.

C.3. Benchmark Firms

Our excess value measure calculates imputed values by multiplying the median ratio of total capital to sales for single-segment domestic firms in the same industry times the level of sales for the individual segment. This approach can be problematic if the segments of diversified firms differ systematically from the median single-segment firm. To examine this possibility, we compare earnings before interest and taxes (EBIT), sales revenue, capital expenditures, and total assets for the segments of diversified firm with those of single-segment, domestic firms. We find that the segments of globally diversified firms are substantially larger than single-segment firms. For example, the median sales revenue of segments of multinational firms is \$263 million, as compared to \$107 million for single-segment, domestic firms. The difference is statistically significant at the 0.05 level. Similarly, the segments of multinational firms have significantly greater EBIT, capital expenditures, and assets.

Table VII
Sensitivity and Robustness Tests

Alternative regressions of excess value on dummy variables denoting industrial and global diversification, and a set of control variables. Model (1) reports mean coefficient estimates from annual ordinary least squares regressions. Model (2) reports estimates from a fixed-effects model. Model (3) computes imputed segment values by multiplying the ratio of total capital to sales for the largest (in sales) single-segment domestic firm in the same industry times the level of sales for the individual segment. Model (4) computes imputed values using the ratio of total capital to assets rather than total capital to sales. Model (5) defines industry at the two-digit, rather than four-digit level. A firm is industrially diversified if it reports more than one industrial business segment. Likewise, a firm is globally diversified if Compustat's Geographic Segment File reports any foreign sales for the firm. All control variables are measured as deviations from sales-weighted industry median values. The sample includes 34,200 firm-year observations over the period 1984–1997. Coefficient estimates are reported with *t*-statistics in parentheses below.

Independent Variables	Means of Annual Estimates (1)	Fixed Effects (2)	Largest Single-segment Firm (3)	Value/Assets (4)	2-digit Industry Match (5)
Intercept	0.005 (1.18)	-0.045 (-9.89)	0.113 (22.88)	0.067 (24.45)	-0.013 (-3.74)
Dummy equal to one if only industrially diversified	-0.199 (-17.46)	-0.245 (-17.47)	-0.210 (-16.48)	-0.150 (-5.45)	-0.197 (-20.48)
Dummy equal to one if only globally diversified	-0.177 (-25.12)	-0.203 (-19.13)	-0.120 (-15.55)	-0.145 (-28.07)	-0.148 (-23.23)
Dummy equal to one if both industrially and globally diversified	-0.316 (-19.27)	-0.279 (-16.46)	-0.335 (-24.33)	-0.235 (-7.30)	-0.308 (-29.66)
Relative market value of total capital	0.123 (46.26)	0.222 (65.10)	0.091 (49.01)	0.095 (56.52)	0.128 (67.89)
Relative long-term debt to total capital	-0.401 (-8.79)	-0.411 (-21.75)	-0.278 (-15.87)	-0.984 (-64.54)	-0.393 (-23.06)
Relative capital expenditures to sales	0.422 (9.83)	0.340 (20.41)	0.416 (23.87)	-0.004 (-0.35)	0.459 (28.62)
Relative EBIT to sales	1.150 (13.86)	0.455 (18.04)	0.808 (35.68)	0.462 (27.01)	1.158 (51.03)
Relative R&D to sales	1.281 (12.57)	0.518 (9.50)	0.961 (25.27)	0.426 (14.58)	1.582 (39.54)
Relative advertising to sales	0.058 (0.73)	-0.155 (-1.18)	-0.370 (-4.09)	0.454 (6.29)	0.448 (5.61)
Adjusted R^2	0.272	0.656	0.210	0.256	0.295
Number of observations	14	33,478	26,209	28,895	33,163

To examine whether these size differences affect our valuation inferences, model (3) of Table VII reports coefficient estimates from a regression model in which imputed segment values are calculated based on the largest single-

segment, domestic firm (based on sales), rather than the median firm. Using this alternative benchmarking process, the segments of multinational firms are now smaller than their single-segment peers (\$263 million vs. \$405 million).¹⁷ The results in model (3) indicate that our findings are not sensitive to the size of the benchmark, single-segment firms. Excess values are still negatively related to industrial diversification, to global diversification, and to the combination of the two types of diversification.

An alternative benchmark for international segments might be single-segment firms operating in the same country as the international segment of the diversified firm. However, there are several difficulties with implementing such a procedure using our data. First, as noted earlier, we cannot identify the country of operations from the Compustat Geographic Segment File. Second, we cannot identify from Compustat the industry in which the international segment operates. Third, valuation ratios are likely to be different in different countries due to differences in accounting standards and differences in laws that protect minority investors.¹⁸ For these reasons, an analysis of international benchmark firms is beyond the scope of this study.

C.4. Alternative Valuation Measure

An alternative valuation ratio used in the diversification literature is the ratio of total capital to the book value of assets (see, e.g., Berger and Ofek (1995)). Model (4) of Table VII reports regression results using this alternative valuation measure. Valuation discounts for diversified firms are slightly smaller using this measure. Nonetheless, they remain quite large and statistically significant. The diversification discount is 0.15 for industrial diversification, 0.15 for global diversification, and 0.24 for firms that are both industrially and globally diversified. Thus, our results do not appear to be driven by the choice of valuation measure.

C.5. Industry Definition

We match single-segment firms based on four-digit SIC codes whenever possible. An alternative is to define industry at the two-digit SIC level. Model (5) of Table VII reports regression results using this alternative industry definition. Again, the results are qualitatively identical. Our results are not sensitive to the definition of industry.

¹⁷ The segments of multinational firms now also have lower values for the book value of total assets, EBIT, and capital expenditures.

¹⁸ See, for example, French and Poterba (1991) for an examination of the extent to which differences in accounting conventions can explain differences in the valuation of Japanese and U.S. companies in the late 1980s and early 1990s. LaPorta et al. (2000) find evidence of higher valuation ratios for firms in countries with better protection of minority shareholders.

C.6. Definition of Global Diversification

As noted earlier, our definition of global diversification is based on sales from foreign operations. As such, it excludes export sales. To test the robustness of our findings to this classification scheme, we conduct two additional tests. First, we classify a firm as globally diversified if Compustat reports any sales from foreign operations *or* if export sales account for at least 10 percent of the firm's total sales. This revised classification scheme increases the number of globally diversified firm-years for which we can compute excess values from 11,041 to 14,186. When we reestimate the multivariate regression from the first column of Table VI, our point estimates for the diversification discount are slightly smaller, but remain highly significant. (These results are not reported in a table.) Point estimates place the diversification discounts at 0.19 for industrial diversification, 0.11 for global diversification, and 0.28 for firms that are both industrially and globally diversified. Second, we retain our original classification of global diversification, but exclude as benchmarks single-segment firms for which export sales exceed 10 percent of total sales. These findings (also not reported in a table) are nearly identical to our results in Table VI.

C.7. Alternative Measures of Firm Size

We control for firm size in the multivariate regressions using the firm's market value of total capital. The logic for doing so is that we are attempting to control for those factors that could affect excess value, but do not necessarily have anything to do with diversification. As shown in Table II, globally diversified firms tend to be substantially larger than single-segment domestic firms. To the extent that there are unobserved factors that affect a firm's value and, hence, its excess value, the influence of these factors will be picked up in our firm size variable.

We also estimate, but do not report in a separate table, multivariate regressions using two other size controls: total sales and the book value of total assets. Using either alternative measure of size, the size of the discount for global diversification is reduced from 0.18 to 0.06, but remains significant at the 0.01 level. The discount for firms that are both globally and industrially diversified falls to 0.03, but also remains statistically significant. Thus, although the existence of a global diversification discount is robust, the magnitude of the discount is sensitive to the size control. We conjecture that this is due to sales and the book value of assets incompletely controlling for unobserved factors that affect a firm's value. Because globally diversified firms have, on average, larger market values of total capital, incompletely controlling for this phenomenon will impart a positive bias on the coefficient of the global diversification dummy variable (i.e., there will be a smaller discount).

C.8. The Extent of Global Diversification

Our tests to this point indicate that globally diversified firms are valued at a discount relative to domestic, single-segment firms. An interesting issue is whether the discount differs according to the extent of diversification. To analyze this issue, we replicate the multivariate regressions from the first column of Table VI, but include two interaction terms. The first interacts the global diversification dummy variable with the percentage of sales from foreign operations. The second interacts the dummy denoting firms that are both globally and industrially diversified with the percentage of sales from foreign operations. We find that the coefficients on both interaction terms are significantly negative at the 0.01 level. (These results are not reported in a table.) This indicates that as the extent of diversification increases, the discount for global diversification becomes larger.

D. The Valuation Effects of Changes in Diversification

To complement our cross-sectional tests, we also examine whether changes in diversification status are associated with changes in excess value. From the full sample, we identify any year in which a firm first becomes multinational, ceases to be multinational, first becomes multisegment, or ceases to be multisegment. These changes in diversification status are associated with substantial changes in the firm's asset structure. On average, a firm's book value of total assets increases by 50 percent during the year in which it becomes multinational and by 65 percent in the year in which it becomes multisegment. In contrast, total assets decrease by 5 percent when a firm ceases to be multinational and by 17 percent when the firm ceases to be multisegment.

Table VIII presents year -1 excess values and changes in excess value for the four subsamples for the whole period and for the 1984 to 1988, 1989 to 1993, and 1994 to 1997 subperiods. We label the year in which the firm's diversification status changes as year 0 and measure the change in excess value from year -1 to year 0. The results, as a whole, are largely consistent with the overall negative association between excess value and global and industrial diversification. Firms that become either globally or industrially diversified experience decreases in excess value and firms that cease being either globally or industrially diversified experience increases in excess value. These changes in excess value are statistically significant at better than the 0.10 level with the following exceptions. The change in excess value associated with ceasing to be globally diversified is positive in all subperiods, but is significant only in the 1984 to 1988 subperiod. In addition, becoming globally diversified in the 1984 to 1988 subperiod is associated with a statistically insignificant change in excess value.

The results in Table VIII, thus, suggest that firms generally experience significant declines in excess value in the year in which they become diversified. In addition, data on year -1 excess values show that firms generally have significantly positive excess values in the year before they diversify

Table VIII
Excess Values and Changes in Diversification

Year -1 levels and the change in excess value from year -1 to year 0 are presented. Year 0 is the year in which the firm changes its diversification status. Excess value is measured as the log of the ratio of the firm's total market value to the sum of the imputed market values of its segments. Imputed segment values are calculated by multiplying the median ratio of total capital to sales for single-segment domestic firms in the same industry times the level of sales for the individual segment. Firms are classified as multisegment (i.e., industrially diversified) if they report more than one business segment on Compustat's Industry Segment File and single-segment otherwise. Firms are classified as multinational (i.e., globally diversified) if Compustat's Geographic Segment File reports any foreign sales for the firm and as domestic otherwise. Panel A presents results for the full sample, while panels B, C, and D present results for the 1984-1988, 1989-1993, and 1994-1997 subperiods. Significance of means and medians are measured using a standard two-tailed test and a two-tailed Wilcoxon signed rank test, respectively.

	N ^a	Year -1 Excess Value		Δ Excess Value	
		Mean	Median	Mean	Median
Panel A: Full Sample					
Became globally diversified	511	0.126***	0.102***	-0.077***	-0.056***
Ceased global diversification	150	-0.047	0.009	0.067	0.055
Became industrially diversified	147	0.042	0.005	-0.203***	-0.198***
Ceased industrial diversification	256	-0.085***	-0.087***	0.220***	0.156***
Panel B: 1984-1988					
Became globally diversified	128	0.062	0.019	-0.010	0.046
Ceased global diversification	42	-0.091	-0.037	0.193**	0.102*
Became industrially diversified	39	0.013	0.016	-0.174**	-0.127**
Ceased industrial diversification	86	-0.148***	-0.222***	0.201***	0.103***
Panel C: 1989-1993					
Became globally diversified	166	0.161***	0.167***	-0.084***	-0.088***
Ceased global diversification	49	-0.035	0.049	0.009	0.007
Became industrially diversified	48	-0.035	-0.001	-0.243***	-0.214***
Ceased industrial diversification	74	-0.065	-0.076	0.229***	0.206***
Panel D: 1994-1997					
Became globally diversified	217	0.136***	0.104***	-0.111***	-0.091***
Ceased global diversification	59	-0.025	-0.026	0.026	0.067
Became industrially diversified	60	0.131**	0.029*	-0.191***	-0.189***
Ceased industrial diversification	74	-0.065	-0.076	0.229***	0.206***

^a This represents the number of firms for which we are able to calculate a change in excess value.

***, **, * Significant at the 0.01, 0.05, and 0.10 level, respectively.

globally, and insignificant excess values in the year prior to becoming industrially diversified. Thus, it does not appear that the negative excess values of globally diversified firms are due to poorly performing firms choosing to diversify.

IV. Discussion and Interpretations

Our finding of a discount associated with global diversification is similar to the findings of previous studies that have documented a discount associated with industrial diversification. There are two broad explanations for the diversification discount. First, it could be that diversification and value are endogenously related. That is, either lower valued firms choose to diversify or firms diversify by purchasing lower-valued firms. Second, it could be that diversification causes the diversification discount by somehow destroying value.

Several recent papers examine whether the diversification discount is the result of endogenous choices of firms. Lang and Stulz (1994), for example, find that diversified firms trade at a discount even before they diversify. Graham, Lemmon, and Wolf (2000) find that the discount associated with industrial diversification is driven by firms that diversify through acquisitions. They find that at least half of the diversification discount can be explained by the lower values of the firms that are acquired.¹⁹ Similarly, Campa and Kedia (1999) argue that the diversification discount is substantially reduced (and in some cases, eliminated) with proper controls for the endogeneity of the diversification decision.

One specific causal explanation for the diversification discount is that diversified firms invest inefficiently, investing too much in some segments and too little in other segments. This explanation draws theoretical support from the models of Rajan et al. (2000) and Scharfstein and Stein (2000). In addition, several studies provide empirical support. Both Lamont (1997) and Shin and Stulz (1998) provide evidence that investment in segments of diversified firms is affected by the cash flows of other segments within the firm. This suggests an active reallocation of capital within the firm. In addition, evidence in Rajan et al. and Scharfstein (1998) suggests that this reallocation is inefficient; diversified firms do not reallocate capital to those divisions with the best investment opportunities. Rajan et al. also find a significant relation between firm value and measures of the efficiency of investment allocations within diversified firms.

While the above findings provide support for a causal link between diversification and value, both Chevalier (1999) and Whited (2001) argue that measurement error could account for some of the evidence supporting the inefficient investment explanations. The findings of Lamont and Polk (2001), however, provide perhaps the most convincing evidence to date that the diversification discount is not purely the result of either endogenous firm choices or measurement error. Lamont and Polk employ an exogenous instrument for diversity, the variation in industry investment. They then relate exogenous changes in diversity to changes in firm value and find that changes in

¹⁹ Our findings in Table VIII are consistent with this possibility. Firms that become globally diversified exhibit positive excess values in the year prior to diversification, then exhibit a significant reduction in excess value in the year of diversification.

investment diversity are negatively related to excess value. Moreover, they show that their findings cannot be explained by measurement error. Hence, they conclude that diversification destroys value.

On balance, therefore, the evidence suggests that the association between firm value and diversification is not simply the result of endogenous firm choices. Rather, there appears to be some causal link between diversification and value. The evidence from industrially diversified firms is broadly consistent with models in which divisional managers exert influence to increase the assets under their control.²⁰ This can lead to inefficient investment decisions. Because international divisions are also headed by a separate divisional manager, it seems plausible that similar influence problems exist within multinational firms. Moreover, the costs of coordinating corporate policies in diversified organizations (e.g., Harris et al. (1982) and Myerson (1982)) and the difficulties in monitoring managerial decision making in globally diversified firms (Bodnar et al. (1999)) increase the likelihood that the costs of global diversification outweigh the benefits.

Unfortunately, data limitations prevent us from conducting tests similar to those in the industrial diversification literature to conclusively establish a causal link between global diversification and value. Nonetheless, indirect support for this view comes from Moeller and Schlingemann (2000) who report that bidder gains and post-takeover changes in operating performance are significantly lower for cross-border acquisitions than for domestic acquisitions. Interestingly, they also find that these differences exist primarily during the subperiod in which cross-border takeover activity has increased dramatically (1991 to 1995).

V. Conclusions

Using a sample of 44,288 firm-years over the period 1984 to 1997, we document an increase in global diversification over time: a greater fraction of U.S. firms report international operations in 1997 than in 1984 and, on average, those firms that are multinational derive a significantly greater fraction of their revenues from their foreign operations in 1997 than in 1984. Industrial diversification declines over the same period, although the decline in number of segments is more pronounced than the decline in the fraction of firms that are industrially diversified. We find no evidence, however, that individual firms substitute global for industrial diversification.

Despite the increase in global diversification over time, we find that global diversification is associated with valuation discounts that are economically and statistically significant relative to single-segment, purely domestic firms. These discounts are similar in magnitude to those associated with industrial diversification and are present throughout the entire 1984 to 1997

²⁰ See, for example, Meyer et al. (1992), Rajan and Zingales (1995), Rajan et al. (2000), and Scharfstein and Stein (2000).

period. Moreover, firms that become globally or industrially diversified experience downward revisions in their excess value, while firms that cease being either globally or industrially diversified experience increases in excess value. Thus, a presumed increase in the feasibility of global diversification over time has, in fact, led to a greater incidence and higher levels of global diversification. Increased feasibility has not, however, translated into value-creation opportunities for the single-segment firms that comprise the majority of U.S. firms.

Our findings for global diversification provide an interesting parallel to the findings for U.S. conglomerates in the 1960s. During that time, most commentators and corporate strategists extolled the virtues of conglomerates, and a large fraction of U.S. firms adopted industrial diversification strategies. In retrospect, these strategies appear to have been mistakes. Servaes (1996) shows that conglomerates were valued at a discount, on average, during the conglomerate merger wave of the 1960s. Subsequent academic studies have identified specific sources of the value discount and conglomerates have fallen out of favor. Our evidence suggests that the refocusing of U.S. firms that began in the 1980s continues to this day.

Commentators today often extol the virtues, if not the competitive necessity, of global diversification. Consistent with this general view, our findings indicate that an increasing fraction of U.S. firms have adopted global diversification strategies. However, much like the situation with conglomerates in the 1960s, we find no evidence that these global diversification strategies have created shareholder value, on average. Because managers can derive many of the same private benefits from global diversification that they can with industrial diversification, we conjecture that, on average, global diversification represents a cost of the agency relationship that exists between managers and investors. Further evidence on the determinants of global diversification strategies and of their valuation impact would represent useful contributions.

REFERENCES

- Amihud, Yakov, and Baruch Lev, 1981, Risk reduction as a managerial motive for conglomerate mergers, *Bell Journal of Economics* 12, 605–617.
- Berger, Philip G., and Eli Ofek, 1995, Diversification's effect on firm value, *Journal of Financial Economics* 37, 39–65.
- Bodnar, Gordon M., Charles Tang, and Joseph Weintrop, 1999, Both sides of corporate diversification: The value impacts of global and industrial diversification, Working paper, Johns Hopkins University.
- Bodnar, Gordon M., and Joseph Weintrop, 1997, The valuation of foreign income of U.S. multinational firms: A growth opportunities perspective, *Journal of Accounting and Economics* 24, 69–98.
- Campa, Jose M., and Simi Kedia, 1999, Explaining the diversification discount, Working paper, New York University.
- Caves, Richard, 1971, International corporations: The industrial economics of foreign investment, *Econometrica* 38, 1–27.
- Chevalier, Judith, 1999, Why do firms undertake diversifying mergers? An examination of investment policies of merging firms, Working paper, University of Chicago.

- Christophe, Stephen E., 1997, Hysteresis and the value of the U.S. multinational corporation, *Journal of Business* 70, 435–462.
- Christophe, Stephen E., and Ray J. Pfeiffer, Jr., 1998, The valuation of U.S. MNC international operations during the 1990s, Working paper, George Mason University.
- Click, Reid W., and Paul Harrison, 2000, Does multinationality matter? Evidence of value destruction in U.S. multinational corporations, Working paper, Federal Reserve Board.
- Comment, Robert, and Gregg A. Jarrell, 1995, Corporate focus and stock returns, *Journal of Financial Economics* 37, 67–87.
- Denis, David J., and Bharathram Thothadri, 1999, Internal capital markets, growth opportunities and the valuation consequences of diversification, Working paper, Purdue University.
- Denis, David J., Diane K. Denis, and Atulya Sarin, 1997, Agency problems, equity ownership, and corporate diversification, *Journal of Finance* 52, 135–160.
- Errunza, Vihang, and Lemma Senbet, 1981, The effects of international operations on market value of the firm: Theory and evidence, *Journal of Finance* 36, 401–417.
- Errunza, Vihang, and Lemma Senbet, 1984, International corporate diversification, market valuation, and size-adjusted evidence, *Journal of Finance* 39, 727–745.
- French, Kenneth R., and James M. Poterba, 1991, Were Japanese stock prices too high? *Journal of Financial Economics* 29, 337–364.
- Graham, John R., Michael L. Lemmon, and Jack Wolf, 2000, Does corporate diversification destroy value? Working paper, Duke University.
- Harris, Milton, Charles D. Kriebel, and Artur Raviv, 1982, Asymmetric information, incentives and intrafirm resource allocation, *Management Science* 28, 604–620.
- Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323–329.
- Jensen, Michael C., 1993, The modern industrial revolution, exit, and the failure of internal control systems, *Journal of Finance* 48, 831–880.
- Jensen, Michael C., and Kevin J. Murphy, 1990, Performance pay and top management incentives, *Journal of Political Economy* 98, 225–264.
- Lamont, Owen, 1997, Cash flow and investment: Evidence from internal capital markets, *Journal of Finance* 52, 83–110.
- Lamont, Owen, and Christopher Polk, 2001, Does diversification destroy value? Evidence from industry shocks, *Journal of Financial Economics* 63, 51–77.
- Lang, Larry H. P., and René M. Stulz, 1994, Tobin's q , corporate diversification and firm performance, *Journal of Political Economy* 102, 1248–1280.
- LaPorta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 2000, Investor protection and corporate valuation, Working paper, National Bureau of Economic Research.
- Liebeskind, Julia P., and Tim C. Opler, 1994, Corporate diversification and agency costs: Evidence from privately held firms, Working paper, Ohio State University.
- Meyer, Margaret, Paul Milgrom, and John Roberts, 1992, Organizational prospects, influence costs, and ownership changes, *Journal of Economics and Management Strategy* 1, 9–35.
- Moeller, Sara B., and Frederick P. Schlingemann, 2000, International takeovers and bidder performance, Working paper, Southern Methodist University.
- Morck, Randall, and Bernard Yeung, 1991, Why investors value multinationality, *Journal of Business* 64, 165–187.
- Morck, Randall, and Bernard Yeung, 1998, Why investors sometimes value size and diversification: The internalization theory on synergy, Working paper, Institute for Financial Research, University of Alberta.
- Myerson, Roger B., 1982, Optimal coordination mechanisms in generalized principal–agent problems, *Journal of Mathematical Economics* 10, 67–81.
- Rajan, Raghuram G., Henri Servaes, and Luigi Zingales, 2000, The cost of diversity: The diversification discount and inefficient investment, *Journal of Finance* 55, 35–80.
- Rajan, Raghuram G., and Luigi Zingales, 1995, The tyranny of the inefficient: An inquiry into the adverse consequences of power struggles, Working paper, University of Chicago.
- Scharfstein, David S., 1998, The darker side of internal capital markets II: Evidence from diversified conglomerates, Working paper, Massachusetts Institute of Technology.

- Scharfstein, David S., and Jeremy C. Stein, 2000, The dark side of internal capital markets: Divisional rent-seeking and inefficient investment, *Journal of Finance* 55, 2537–2564.
- Servaes, Henri, 1996, The value of diversification during the conglomerate merger wave, *Journal of Finance* 51, 1201–1225.
- Shin, Hyun-Han, and René M. Stulz, 1998, Are internal capital markets efficient? *Quarterly Journal of Economics* 113, 531–552.
- Shleifer, Andrei, and Robert Vishny, 1991, The takeover wave of the 1980s, *Journal of Applied Corporate Finance* 4, 49–56.
- Stein, Jeremy C., 1997, Internal capital markets and the competition for corporate resources, *Journal of Finance* 52, 111–133.
- Stulz, René M., 1990, Managerial discretion and optimal financing policies, *Journal of Financial Economics* 26, 3–27.
- Whited, Toni M., 2001, Is it inefficient investment that causes the diversification discount? *Journal of Finance* 56, 1667–1691.

