# Industry Structure and Value-Motivated Conglomeration

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ABSTRACT

Agency problems are often cited to explain why managers diversify their firms even though diversification strategies are often claimed to destroy value. In theory, however, conglomeration can be beneficial and the popular press often discusses conglomeration decisions as being driven by industry conditions. We argue that value maximization theories of conglomeration imply that two industry factors (growth opportunities and industry concentration) are negatively related to predicted degrees of conglomeration and find empirical support in a panel of 50 industries across 20 years. Our study also documents that conglomerate structures are more valuable when industry conditions predict high levels of conglomeration. Although our evidence does not rule out the existence of agency-motivated conglomeration, we conclude that value-maximization plays an important role.

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## INDUSTRY STRUCTURE AND VALUE-MOTIVATED CONGLOMERATION

A firm's decision to modify the scope of its activities – by engaging in diversifying acquisitions, for instance – can significantly affect shareholder value. The effect of scope on firm value has been actively studied and there is substantial literature on whether conglomeration is value driven or is largely the product of agency motives (see Montgomery (1994) and Stein (2001) for a survey of this literature). These studies typically focus on the individual conglomerate firm and examine the firm's organizational structure and investment policies to understand if conglomeration creates or destroys value through its effect on resource allocation. The impact of *industry* structure and investment opportunities on the extent to which firms in an industry are organized under the conglomerate form, however, has received much less attention in the academic literature.

The influence of industry factors becomes apparent when we consider the intertemporal variation in conglomeration in various industries. It is well known that while conglomeration in the U.S. increased during the sixties and seventies (Servaes (1996)), firms have become increasingly focused on their core activities during the eighties and nineties. Comment and Jarrell (1995) document, for instance, that about 56% of exchange-listed firms in 1988 were in only one industry segment, compared to only 38% in 1979.

Consistent with this pattern, evidence in the paper indicates that, on average, industries experienced a decrease in conglomeration. The interesting observation, however, is that despite the average trend the picture at the industry level is more complex, with considerable variation in the pattern of conglomeration across industries. This is apparent from Figure 1, which plots the degree of conglomeration in four selected industries over the period 1978-1997. As indicated, while the degree of conglomeration in the measuring and control devices industry follows the general pattern and steadily declines over this period, the same cannot be said about the other three industries in Figure 1. In the telephone communication industry for instance, the degree of conglomeration generally increases over much of this period, while despite some early fluctuations, there is little overall change in the computer and office equipment industry. In contrast, the motion picture production and services industry exhibits wild swings but a net decline in the degree of conglomeration.

While relatively little attention has been paid to the role of industry structure in the academic literature on conglomeration, and to the degree of conglomeration in entire industries, it is commonplace for the popular press to discuss diversifying or refocusing actions by firms in terms of industry opportunities and technological and strategic considerations. For instance, several mergers between telecommunication firms and cable TV companies or between producers of entertainment products and cable and satellite companies have been analyzed in terms of a convergence in technology across the industries (see Chalm-Olmstead (1998), for example). This suggests that there may be circumstances that favor conglomeration in an industry, i.e., conditions under which fewer of an industry's units are likely to be organized as stand-alone firms rather than as conglomerate divisions. The question that arises then is whether conglomeration is a value-creating activity when such favorable industry conditions exist. Our empirical approach allows us to address this question.

As a first step, we identify industry factors that favor conglomeration from a shareholder value perspective. We do so by drawing upon existing theories that provide a value-creating rationale for conglomeration, and then developing predictions regarding the impact of industry level factors on the degree of conglomeration in an industry. We focus on two primary factors that are predicted by such theories to influence the degree of conglomeration in an industry: the growth opportunities available to firms in the industry, and the competitive environment in the industry, specifically, the degree of concentration in the industry (i.e., the extent to which a few players dominate the industry). As we discuss in more detail later, value theories predict a lower degree of conglomeration in industries with higher growth opportunities and in those that are more concentrated.

These implications are tested using panel data for fifty of the largest industries in the U.S. over the twenty-year period 1978-1997. The median market-to-book value of stand-alone firms in an industry serves as our proxy for the industry's growth opportunities, while an asset-based Herfindahl index (using assets of both conglomerate divisions and stand-alone firms) is used to measure the extent to which an industry is concentrated. The extent of conglomeration in an industry is measured by the number of conglomerate divisions in an industry as a proportion of the total units (conglomerate divisions plus single-segment firms) in that industry.

The empirical results indicate that the two industry factors are significant predictors of the level of conglomeration in the manner predicted by the value theories of conglomeration.

The next step is to investigate whether conglomeration increases value when, on the basis of the industry factors considered, an increase in conglomeration is predicted. This allows us to probe a long-standing question of whether conglomeration can enhance firm value in the right environment, although it may deliver few benefits on average. To measure the relative value of conglomerates operating in a particular industry, we introduce a metric called "industry excess value" that is derived from the excess values of individual conglomerate firms operating in the industry. (The excess value of an individual conglomerate is defined in the usual way, as the market value of the conglomerate relative to the sum of its divisions' values imputed from single-segment firms). We find that conglomeration levels *predicted* by the two industry factors (growth opportunities and industry concentration) and industry excess values are strongly and positively related. Thus, conditions predicted by value theories to be favorable to conglomeration are also conditions under which a conglomerate structure is more valuable.

These findings help to explain changes in conglomeration levels across industries and over time. The results imply that conglomeration increases in industries that face a reduction in growth opportunities and the level of concentration. More importantly, they imply that when increases in industry conglomeration accompany decreases in growth opportunities and the level of concentration in the industry, they increase firm value on average. Collectively, these results prescribe some of the conditions under which conglomeration can add value (or destroy less value). While these results provide support for value theories of conglomeration, they do not refute the notion that agency problems may be responsible for the formation of many value-destroying conglomerates. What our results suggest, however, is that value maximization appears to play a significant role in many conglomeration decisions as well.

The paper is organized as follows. Section 1 provides an overview of the various value-maximization theories of conglomeration and develops predictions for what they imply for the relation between conglomeration levels and industry factors. Section 2 explains the construction of the data and provides definitions of the variables. Section 3 discusses the results. Section 4 considers whether agency theories can explain the relation between the industry structure and the degree of conglomeration. Section 5 concludes.

## 1. Value theories of conglomeration

### 1.1. Review of value theories

In this section we discuss the prevailing value theories of conglomeration. There are three theories that fall under this rubric: market power theories, the resource hypothesis, and internal capital markets theories. The first two theories assume that managers are unconditional shareholder value maximizers and that there are no moral hazard problems between shareholders and managers. These two theories depend on some form of market friction or failure that is not based on agency problems. By contrast, internal capital market theories generally regard the decision to diversify as a value-maximizing response to the conditions arising out of an agency problem. The agency problem is not specific to conglomerates, however, and the conglomeration decision is not divergent from shareholder interests. Therefore, we classify internal capital market theories as value theories, not agency theories. The key is that the conglomeration decision is made in order to maximize firm value and mitigate the negative effects of an agency problem.

Market power theories argue that conglomerates exercise market power through several channels. For instance, they might employ predatory pricing tactics in one market using the profits from another market (i.e., the cross-subsidization or "deep pockets" argument).[1] Or, conglomerates that meet in multiple markets can tacitly collude by competing less vigorously with each other to create spheres of influence in specific markets (Bernheim and Whinston (1990)). The resource hypothesis argues that excess capacity in production factors leads to diversification if the production factors cannot be sold off at value (Penrose (1959) and Teece (1980, 1982)). For example, if a firm possesses indivisible physical resources beyond the optimal need for one product line, it can employ them in other product lines. In some cases, the excess capacity arises in human resources because managers or workers become more efficient

[1] See Bolton and Scharfstein (1990) for a model on how predatory pricing can drive a rival out.

through learning. In some other cases, organizational knowledge that is accumulated in the process of developing a product or process can be used effectively for other products. As Teece (1982) points out, in all these cases there must exist a market failure that prevents the transfer of these excess production resources to other parties. Models by Matsusaka (2001) and Maksimovic and Phillips (2002) are in the spirit of the resource hypothesis. Matsusaka (2001) argues that firms with broad organizational capabilities use diversification as part of a dynamic value-maximizing strategy to seek matches for their capabilities. Maksimovic and Phillips (2002) suggest that firms optimally shift finite organizational capabilities to a more productive activity when diminishing returns to scale reduce the productivity in their primary activity.

Internal capital market theories argue that a conglomerate structure improves the allocation of investment capital. The common feature is that conglomeration provides management with an option to deploy capital to its best uses. This option is valuable because the external capital market, due to some market imperfection, is unable or unwilling to substitute for the internal market. Williamson (1975) argues that external capital markets can sometimes fail and that the internal capital market created by a conglomerate structure can increase allocational efficiency. In Stein (1997), for example, external markets impose a capital constraint on all projects (whether stand-alone or grouped as a conglomerate) because managers are reluctant to return excess cash to shareholders. Headquarters, having better information about project profitability, can allocate the limited capital more efficiently among the firm's projects if the projects are grouped together in a conglomerate structure.[2] Fluck and Lynch (1999) suggest that conglomerates allow marginally profitable projects to obtain funding

[2] It is interesting to note that the internal capital markets theory can be viewed as a variant of the resource hypothesis, wherein the resource in excess is capital and the market imperfection arises from the manager's desire to control capital. Some of the limited capital available to managers might become excessive if external events make the investments in one segment unprofitable. Since the managers have no desire to return it to investors, they seek other avenues of investment to maximize shareholder value.

and survive a period of distress.[3] Khanna and Tice (2001) find that when a rival firm enters the local market, divisions of conglomerates respond with superior investment decisions to those that stand-alone firms make.

1.2. Empirical evidence on value theories

There is a large body of work that investigates whether or not conglomeration adds value. The initial evidence seems to support the notion that conglomerate segments are valued less than "equivalent" single-segment firms. Lang and Stulz (1994) and Berger and Ofek (1995) find that U.S. conglomerates trade at a discount of about 15% relative to a portfolio of median single-segment firms in the same industries. Lins and Servaes (1999) find no significant discount for German firms, but discoutns of around 10% in Japan and 15% in the U.K. In addition, there is some evidence (see Lamont (1997) and Shin and Stulz (1998)) that one of the causes of the value differential might be the inefficiency of internal capital markets in conglomerates that misallocate capital among their segments. Rajan, Servaes, and Zingales (2000) and Scharfstein (1998) find evidence that is consistent with misallocation of capital within conglomerates.[4]

[3] Aron (1988) argues that diversification can enhance shareholder value by mitigating moral hazard as multiple segments provide correlated signals of managerial effort. This theory also falls under the class of value theories since conglomeration is a value-enhancing response to a moral hazard problem prevalent in all firms.

[4] There are several papers that attempt to explain the diversification discount and/or the misallocation of capital. Scharfstein and Stein (2000) argue that capital allocation might be the least costly way to bribe divisional managers who are engaging in value decreasing activities. Rajan, Servaes, and Zingales (2000) provide a theory based on divisional managers' incentive to prefer investments that increase the market value of their human capital at the expense of shareholder value. Headquarters can only allocate resources, and it is unable to enforce optimal rules for sharing any divisional surplus. It turns out in their model that if divisions have very diverse resources, there will be suboptimal investment and headquarters tries to improve shareholder value by making resource allocation less diverse. Goel, Nanda, and Narayanan (2003) suggest that managers with career concerns will overallocate capital to the divisions that enhance their reputation the most.

More recent work has questioned the evidence on both the conglomerate discount as well as capital misallocation. Villalonga (2001) argues that the conglomerate discount disappears when conglomerate segments are evaluated against a more comparable benchmark using propensity scores, instead of a portfolio of median single-segment firms in the same industries. Maksimovic and Phillips (2002), using plant level data, argue that the evidence is consistent with efficient capital allocation in conglomerate. Whited (2001) claims that the observed capital misallocation is an artifact of measurement error arising from the use of Tobin's *q* to proxy for investment opportunities. Correcting for this error, she finds no evidence of capital misallocation in conglomerates. Lamont and Polk (2002), however, argue that they continue to find evidence consistent with inefficient investment even after considering the effects of measurement error. Several researchers argue that the diversification discount might reflect characteristics of firms that choose to conglomerate (see Fluck and Lynch (1999), Matsusaka (2001)). The general flavor of these theories is that firms that are inferior in some way choose to conglomerate, which explains their discount. Empirical support for this endogeneity bias is provided by Diltz and Hyland (2002), Campa and Kedia (2002), Chevalier (2000), and Graham, Lemmon and Wolf (2002). Burch and Nanda (2002), however, study spin-off events and infer the excess value loss from a conglomerate structure (prior to spin-off) and its relation to divisional characteristics. They conclude that the conglomerate structure itself can detract from firm value under some circumstances. The question of selection bias remains in some sense, however, since conglomerates that choose to engage in a spin-off are presumably ones for which management believes the spin-off is likely to create value. In summary, the issue of whether the diversification decision creates or destroys value is still under debate.

1.3. Value theories and the relation between industry structure and degree of conglomeration

In order to investigate whether the cross-sectional and intertemporal variations in conglomeration are the result of shareholder value-maximizing decisions, we first identify two determinants of the degree of conglomeration suggested by the value theories: industry growth opportunities and the degree of concentration. In this section we motivate the implications of the value theories (market power, resource hypothesis, and internal capital markets) for the relationship between each of these variables and the degree of conglomeration.

The market power theory suggests that firms in industries with greater growth opportunities have sufficient value creation opportunities and, therefore, have little incentive to operate under a conglomerate umbrella in order to use the deep pockets of another segment to fund predatory pricing tactics. When growth opportunities abound in an industry, rents are easier to obtain, and the need to engage in predatory pricing is diminished. Furthermore, when there are clear growth opportunities, external capital is more easily available and hence the need to conglomerate to generate internal capital is muted. Therefore, companies in industries with greater growth opportunities are unlikely to acquire segments with deep pockets and, in general, there is little need to conglomerate. The market power theory's predicted relation between conglomeration and industry concentration is also negative, with a similar rationale. Firms that have already obtained market power have less of a need to obtain it through predatory pricing. If there are firms without market power in concentrated industries, they are also unlikely to engage in predatory pricing since the firms with market power, with more resources and stronger market positions, are unlikely to be successfully driven out by such tactics.

The resource hypothesis contends that companies expand into other segments in order to employ underutilized resources that cannot be sold. Since it is less likely that there are excess production resources in a high-growth industry, the resource hypothesis implies that the motivation for conglomeration is diminished in high-growth industries. The implication of the

resource hypothesis regarding industry concentration is more subtle. One might argue that, productive resources are likely to be more fully deployed in concentrated industries and, therefore, there is less need for diversification to deploy these assets. By itself, however, the resource hypothesis does not lead to a strong prediction regarding conglomeration and industry concentration.

The internal capital market theories are based on the idea that conglomeration provides management an option to direct capital to more productive sources. Such an option is not as valuable when the industry has strong growth prospects. The capital markets are more likely to provide capital to firms in clear growth industries, since managers have less cause to waste funds. Hence there is less need for such firms to be subsidized by other divisions within a conglomerate structure, and we would expect companies in growth industries to be less likely to conglomerate. In a concentrated industry, the value of such an option will be lower as well, as the need to exercise the option arises less frequently. The reason is that there is less need, on average, to switch capital from segments operating in concentrated industries since the profitability of those segments, on average, is likely to be high (see Shepherd (1990) for evidence on the positive relation between concentration and profitability). Therefore, the internal capital market theories also imply a negative relation between concentration and conglomeration.

It is worth noting that our discussion about the implications of the value theories has focused on the impact of various factors on the degree of conglomeration of a representative industry. Consider, for instance, the argument that value theories imply a negative relationship between growth opportunities and the degree of conglomeration in an industry. If some firms in an industry with few growth opportunities choose to diversify, this increases the degree of conglomeration not only in the industry under consideration, but also in the industries into which these firms diversify. Since the degree of conglomeration in an industry is influenced by not only conditions in that industry but also by conditions in other industries, one might wonder

if our preceding arguments, which are based on conditions prevailing in one industry, are invalidated. We claim that this is unlikely to be the case. This is because when a firm from an industry diversifies because of fewer growth opportunities, it is more likely to merge with another firm from a different industry which is also interested in diversifying for any of the reasons for conglomeration we have detailed. Hence, both industries are likely to have some of the conditions that promote conglomeration according to the value theories.[5]

In summary, the various value theories suggest that in industries with more growth or investment opportunities, there will be less conglomeration. To varying degrees, all of them also suggest that in more concentrated industries there will be less conglomeration. These predictions are stated in the following empirical hypothesis:

H1: Value theories imply that the conglomeration level in an industry will be negatively related to both its growth opportunities and its degree of concentration.

### 1.4. Role of industry structure in value-creating conglomeration

Any empirical support for Hypothesis (*H1*) provides only partial confirmation of the role of value theories in the conglomeration decision. This is because it is possible that agency and other non-value explanations can have similar predictions regarding the relationship between the industry factors we examine and conglomeration levels. (We discuss the extent to which agency theories are likely to have the same predictions in a later section). To confirm that value theories play a role in conglomeration we, therefore, need evidence that conglomeration actually results in value improvements when the value theories predict such

[5] If firms in industries with conditions favorable to conglomeration combine with those in industries with conditions unfavorable to conglomeration, it would result in no significant relationship between the value of conglomerate firms and factors that measure the desirability of the conglomerate structure. Hence, whether or not firms that increase their conglomeration levels tend to combine with similar firms (in terms of the industry factors we explore) is an empirical question on which our analysis will shed light.

benefits. If Hypothesis (*H1*) is supported, then we can interpret *predicted* conglomeration levels (as predicted by growth opportunities and industry concentration) as proxying for the extent to which industry conditions favor conglomeration. This leads us to our second hypothesis:

H2: The values of conglomerates relative to single-segment firms in an industry should be positively related to the industry's conglomeration level that is predicted by the growth opportunities and concentration in the industry.

## 2. Data sources and construction of variables

### 2.1. Data sources and choice of industries

We use the Compustat Industrial Segment (CIS) database for divisional data and the Compustat annual industrial database for single-segment firm data for the years 1978-1997. Both active and research data are used to avoid survivorship bias. Our intent is to test the hypothesis using the 50 largest U.S. industries, based on the number of market participants (single-segment firms plus divisions of conglomerates in an industry) in 1988.[6] Following the usual practice in the literature, we eliminate financial services and regulated utility industries. We also eliminate all industries that have more than one missing necessary data item over the twenty-year period. We then select the top 50 industries in terms total number of market participants. Excluding the financial services and regulated utilities industries, this results in a sample consisting of 50 of the largest 79 industries (according to the total number of conglomerate divisions and stand-alone firms operating in the industry). In four of these 50 industries there is one missing data point. We relax our variable construction requirements for

[6] This year is chosen as a mid-way point during the time period we study. Results are robust to using alternative years to determine the 50 industries. Using more than 50 industries results in missing data which is problematic for the panel data approach we employ.

these four cases, and the adjustments we make are described in detail in the subsections that follow.

In selecting the 50 industries, the number of market participants is determined as follows. We first count the total number of divisions and single-segment firms operating in each 3-digit SIC industry in 1988. To qualify as a single-segment firm in 1988, the firm must not have multiple divisions (as reported in the CIS database) during this year, and must have valid assets or valid sales. To qualify as a division in 1988, a candidate's parent firm must have multiple divisions reported in this year.[7] Thus, all divisions of multi-divisional parent firms in our CIS database are included for counting purposes.

## 2.2. Variable construction

### 2.2.1. Degree of conglomeration (Cong)

This variable measures the extent to which units in an industry are under the conglomerate structure and is defined as the number of conglomerate divisions in an industry divided by the sum of the number of conglomerate divisions and the number of single-segment firms in the industry. Conglomerate divisions and single-segment firms are counted using the same methodology outlined above for industry selection.

### 2.2.2. Industry median market-to-book (IndMB)

We measure growth opportunities by the median industry market-to-book ratio. The market-to-book ratio of a firm is defined as the market value of the firm (market value of common stock plus book value of long-term debt and current liabilities plus book value of preferred stock) divided by the book value of its assets. This ratio is calculated for the universe of single-segment firms in the Compustat annual database in the 50, three-digit SIC industries

[7] All of the divisions in our divisional data (for conglomerate firms) have positive 1988 sales, so we are not concerned that our sample includes invalid divisions.

and the median is calculated for each industry in each year. We require that an industry have at least five valid ratios, except for one industry year (out of 1,000 total), where this restriction is relaxed so a median can be calculated.

2.2.3. Industry Herfindahl index (IndHerf)

We measure industry concentration with an asset-based *Herfindahl* index. Because we wish to account for all players in the industry, both conglomerate divisions and single-segment firms in the industry are used. *IndHerf* is calculated as follows:

$$IndHerf = \frac{\sum_{i=1}^{n} (A_i)^2}{\left( \sum_{i=1}^{n} A_i \right)^2}, \tag{1}$$

where $A_i$ is the book value of assets of the single-segment firm or the conglomerate division $i$ operating in the industry, and $n$ is the total number of single-segment firms and conglomerate divisions in the industry.

2.2.4. Industry excess values (Weighted-EV and OLS-EV)

We introduce a metric called "industry excess value" to measure the relative values of conglomerates operating in an industry. To begin, we essentially follow Berger and Ofek (1995) in constructing conglomerate excess values (*CEV*s), defined as follows:

$$CEV = \ln\left[ \frac{CMV}{\sum_{i=1}^{n} DA_i \left[ IND_i (V/A) \right]} \right], \tag{2}$$

where,

$CMV$ = market value of common equity, plus book value of debt of the conglomerate, plus book value of preferred stock,

$DA_i$ = asset size for Division $i$,

$IND_i(V/A)$ = median ratio of total capital (market value of common equity, plus book value of debt, plus book value of preferred stock) to assets for single-segment firms in the 3-digit SIC industry of Division *i*, and,

$n$ = number of divisions in the conglomerate firm.

Unlike in Berger and Ofek, *CMV* includes preferred stock. Following Berger and Ofek, industry medians are taken from the narrowest SIC grouping that includes at least five single-segment firms with sufficient data for computing the ratio. We also use their methodology in grossing-up divisional assets and the elimination of extreme excess values.[8]

*Weighted-EV* for an industry is calculated by taking a weighted average of *CEV*s for firms with segments operating in the industry. To illustrate, suppose there are only two conglomerate firms *X* and *Y*, with conglomerate excess values $CEV_X$ and $CEV_Y$, each with divisions operating in "industry *1*." Suppose that conglomerate *X* has total assets of 200, with 150 allocated in industry *1*, and that conglomerate *Y* has total assets of 1000, with 300 allocated to industry *1*. The excess value for industry *1*, $Weighted\text{-}EV_1$, is calculated as follows:

$$Weighted - EV_1 = \frac{CEV_X \times \left(\frac{150}{200}\right) + CEV_Y \times \left(\frac{300}{1000}\right)}{\left(\frac{150}{200}\right) + \left(\frac{300}{1000}\right)} \qquad (3)$$

In the above measure, the weight given to the excess value of a conglomerate in calculating the excess value of an industry is directly related to what fraction of the conglomerate's assets are devoted to that industry. The notion behind this construction is that a division that represents a larger fraction of a conglomerate has a greater impact on its excess

[8] Berger and Ofek (1995) eliminate conglomerates where the sum of divisional assets deviates from parent firm aggregate assets by more than 25%. They then gross-up divisional assets so their sum equals the parent's aggregate assets. They also avoid extreme excess values by eliminating conglomerates where sum of divisional imputed values (the denominator in the *CEV* definition) is less than one-fourth or more than four times *CMV*.

value than a smaller division.[9] We require that at least five divisions in an industry have valid parent *CEV* measures in order to compute *Weighted-EV*. In three of the 1000 industry-years, this condition is not met, and therefore, we ease the restriction on the number of divisions required.

Using the same notion as above (that a division that represents a larger fraction of a conglomerate has a greater impact on its excess value), we construct an alternative measure of industry excess value which we denote *OLS-EV*. This measure uses an ordinary least squares approach (one regression for each year), with the conglomerate excess value as the dependent variable and the relative asset weights of the divisions operating in various industries as the independent variables. The coefficients of each industry are then interpreted as the excess value of that industry. A detailed explanation of the construction of the *OLS-EV* variable is provided in the Appendix.

## 3. Results

### 3.1. Intertemporal and inter-industry patterns in variables

Tables 1 and 2 describe the data. In Table 1 we present the variables used for the industries in 1980 and 1995. These years are chosen because they are near the endpoints of our

[9] The measure we use takes into account the importance of the industry to a conglomerate and provides an indicator of the excess value of a typical (i.e., randomly-chosen) conglomerate firm with a division operating in a particular industry. Other measures of industry excess value, based on different weighting schemes, can also be computed. For example, we can construct a measure of excess value for an industry by assigning a weight to the excess value of each conglomerate equal to the asset size of each conglomerate's division in that industry relative to the total assets of all divisions (of all conglomerates) in that industry. In the construction of $Weighted\text{-}EV_1$ above, the (150/200) weights would be replaced with (150/450) and the (300/1000) weights would be replaced with (300/450). Such a measure provides a value-weighted indicator of industry excess value regardless of the importance of the industry to a particular conglomerate. The results hold using this alternative measure of industry excess value.

time period. We present *Weighted-EV* for the industry excess values, since *OLS-EV* has fairly similar values and is used mainly as a robustness check on the results. As can be seen in Table 1, there is considerable variation across both industries and time. For example, in 1980 conglomeration levels range from a low of 17% (in the computer and office equipment industry and also the telephone communication industry) to a high of 87% (in the aircraft and parts industry and also the construction and related machinery industry). There are steep declines in the conglomeration levels of many industries, while others show a smaller decline or a slight increase. For example, the conglomeration level of the drugs industry declines sharply from 68% to 18%, while that for the industrial organic chemicals industry experiences a slight increase from 80% to 83%. There is also considerable variation across industries and time for the other variables we report (*IndMB,* or industry market-to-book, *IndHerf,* or industry *Herfindahl*, and *Weighted-EV*, or the weighted industry excess value metric).

3.2. Yearly summary statistics

Table 2 presents summary statistics for the variables in our study. The trend toward focus during the 1980s and 1990s is quite apparent, as the mean (median) *Cong* steadily declines from a high of 70% (73%) in 1978 to a low of 44% (44%) in 1997. It is interesting to note that overall, industry concentration levels have not changed dramatically through time (as seen by the means and medians for *IndHerf*). There are two items of note in regards to industry excess values. First, there is considerable variation from year to year, but there is no noticeable overall pattern through time. Second, comparing *Weighted-EV* to *OLS-EV* confirms that the two measures have fairly similar values, at least at the yearly aggregate level as measured by the means and medians across industries. Thus, in spite of their quite different empirical constructions, the two measures seem consistent with each other. We note that the median *Weighted-EV* and *OLS-EV* across all years are –0.13 and –0.12, respectively. Not surprisingly

given their construction, these are of the same order of magnitude as reported previous studies (e.g., Berger and Ofek (1995)).

3.3. Test of Hypothesis (H1)

In Panel *A* of Table 3 we test Hypothesis (*H1*) and present regressions of conglomeration (*Cong*) on industry growth opportunities as measured by industry market-to-book values (*IndMB*), and industry concentration as measured by the industry *Herfindahl* index (*IndHerf*). We use a panel data approach to appropriately account for industry and time series effects. Specifically, a two-way fixed effects model is used (i.e., both industry and year dummies are included, although not reported) and we use error terms that are corrected for both autocorrelation and heteroskedasticity. As reported, *IndMB* and *IndHerf* are both negatively and significantly related to *Cong*, as Hypothesis (*H1*) predicts (see Model *A1* in Panel *A* of Table 3). For robustness purposes we also use a Fama-MacBeth approach (Fama and MacBeth (1973)) which involves averaging the coefficients of 20 yearly cross-sectional regressions. With this approach, which is not reported in the table, *IndMB* and *IndHerf* are negative and more strongly significant.[10] We conclude that Hypothesis (*H1*) is supported by the data.[11] It is also worth nothing that these results are inconsistent with firms in industries with conditions favorable to conglomeration combining with those in industries that do not favor conglomeration. Such a scenario would result in insignificant coefficients for *IndMB* and *IndHerf*.

[10] We use Hansen-Hodrick-Newey-West autocorrelation and heteroskedasticity consistent *t*-values with 5 lags to establish the significance of the coefficients. The Fama-MacBeth approach is an inferior one for our purposes, since it does not control for the differences in industry-wide conglomeration levels (across all 20 years) due to factors we do not examine. The panel data regression approach, by contrast, allows us to control industry effects by explicitly including industry dummy variables via the fixed effects model.

[11] We also test Hypothesis (*H1*) using the value-weighted industry excess value measure discussed in footnote 9. The two variables *IndMB* and *IndHerf* are significant and have the predicted negative sign.

3.4. Test of Hypothesis (H2)

We now address Hypothesis (*H2*), i.e., the issue of whether conglomeration in an industry creates value when growth opportunities and concentration in an industry are favorable to conglomeration. The results are reported in Panel *B* of Table 3, where industry excess value, as measured by *Weighted-EV* (Model *B1*) or *OLS-EV* (Model *B2*), is regressed on the predicted conglomeration level, denoted *ValueCong1*. *ValueCong1* is obtained by using the model estimated in Panel *A* to construct a predicted value for each industry year. As can be seen, Models *B1* through *B3* show that *ValueCong1* is positively and significantly related to industry excess value. In Model *B1* the coefficient is positive and the *t*-statistic is 8.33 while in Model *B2* the coefficient is positive and the *t*-statistic is 8.73. In Model *B3* we include *ResidCong1,* which is the residual from Model *A1* (i.e., *ResidCong1 = Cong – ValueCong1*). This variable allows us to investigate whether there is any value effect due to the industry's conglomeration level being different from that predicted by the two industry factors. The variable is insignificant ($t = -0.53$), and *ValueCong1* is not materially affected. Results using *OLS-EV* as the dependent variable (which are not reported in the table) are qualitatively similar.

We also repeat the analysis in Panel *B* using a Fama-MacBeth approach (using the 20 cross-sectional models from the Fama-MacBeth version of Panel *A* mentioned previously, and then averaging the slope coefficients of 20 yearly cross-sectional regressions for models *B1* and *B2*). Although not reported in the table, results are qualitatively similar. For example, in Model *B1* the slope coefficient is positive with a *t*-value of 5.42. We conclude that Hypothesis (*H2*) is strongly supported.

One potential concern regarding the robustness of our results has to do with the common components of our industry excess values and *IndMB*. , leading to a potential "hardwiring" of the results. We address this concern in two ways and conclude that the main results of the paper are not due to hardwiring. Table 4 reports the robustness tests.

First, we remove *IndMB* altogether (relying on only *IndHerf*) as a predictor of the degree of conglomeration. The results of this regression are reported as Model *A2* in Table 4. The predicted conglomeration based on Model *A2* is denoted by *ValueCong2* and is used in a regression to predict *Weighted-EV* (see Model *B4*).[12] The results remain highly significant. The *t*-value for *ValueCong2* is slightly lower than that for *ValueCong1* in Table 3, but it still implies very strong significance with a value of 3.46.

Second, we repeat the estimation of Model *B1* of Table 3 (which uses ValueCong1 from that table), but we include *IndMB* directly as a regressor as well. This completely removes the concern that the significance of *ValueCong* is being caused by its proxying for *IndMB.* As Model *B5* of Table 4 shows, we find that *IndMB* is negatively and highly significant ($t$ = -9.92). This is not surprising, since industry excess values (constructed from conglomerate excess values) and single-segment firm market-to-book ratios (whose medians form *IndMB*) should be inversely related. The key result is that *ValueCong1* continues to be positive and significant, with a *t*-value of 3.21. We conclude that Hypothesis (*H2*) is strongly supported by the evidence.

## 4. Do agency models explain the results?

The basis for Hypothesis (*H2*) is the premise that changes in conglomeration, as predicted by the industry growth opportunities and concentration, will tend to be value-increasing. This premise is based on Hypothesis (*H1*), where we have argued that value theories predict that these industry factors are negatively related to the degree of conglomeration in an industry. However, what if agency theories also predicted a negative relationship between industry factors and conglomeration? How would this affect our interpretation of the results as supportive of value motivated conglomeration? We briefly

[12] We report only the results with *Weighted-EV* as the dependent variable. Results with *OLS-EV* as the dependent variable are similar.

discuss below why our results support the existence of value-motivated conglomeration decisions, even if some conglomeration decisions are driven by agency considerations.

Agency theories rely on some sort of friction or contracting problem that allows managers to engage in activities not entirely consistent with shareholder value maximization. There are three prevailing agency theories that have possible links to conglomeration activity: the free cash flow theory proposed by Jensen (1986), the managerial entrenchment hypothesis suggested by Shleifer and Vishny (1982), and the managerial risk-aversion hypothesis of Amihud and Lev (1981). The existing literature presents varying degrees of support for the ability of these explanations to explain conglomeration activity.[13] While these theories offer prescriptions of managerial behavior at the firm level regarding conglomeration, they do not provide clear implications about conglomeration at the industry level and how it relates to industry factors. In particular, these theories do not posit any clear relationships between the degree of conglomeration in an industry and growth opportunities and concentration in that industry. Therefore, the agency theories above are less useful in understanding cross-sectional and intertemporal variations in the degree of conglomeration at the industry level.

Furthermore, the empirical evidence in Table 3 indicates that industry excess values are positively related to the conglomeration level predicted by the industry factors. This implies that value motivation plays an important role in conglomeration decisions even if there are agency theories with similar predicted relationships between industry factors and the degree of conglomeration. Note that if only agency theories explained the relations we observe between conglomeration levels and the industry factors we examine, then the relation between industry excess values and predicted conglomeration levels should be negative, not positive (given the value destruction that agency-motivated conglomeration implies). Thus, we argue that value

[13] The empirical literature on testing the agency motive for conglomeration has focused on the relationship between managerial ownership and diversification (see Aggarwal and Samwick (2003), Amihud and Lev (1981), Denis, Denis, and Sarin (1997), and May (1995)). The results are mixed.

theories do indeed play a role in conglomeration decisions even if some agency theories are consistent with the predictions in hypothesis (*H1*).

We wish to emphasize, however, that our results are not inconsistent with the presence of the agency motive in the context of conglomeration decisions. As stated before, there is considerable evidence that suggests that agency issues might be playing an important role in conglomerate decisions of some companies. Our intent in this paper is to show, using industry level data, that value considerations also play a role in conglomerate decisions and that value-based theories can explain some of the cross-sectional and intertemporal variations in the degree of conglomeration at the industry level.

## 5. Conclusion

The literature has been largely negative in its view of conglomeration. Most empirical studies indicate that, on average, conglomerates trade at a substantial discount to single-segment firms. This has been interpreted as consistent with agency theories explaining conglomeration decisions. In theory, however, conglomeration can be beneficial and driven by value-maximizing goals, and managers and the press often discuss conglomeration decisions in the context of industry conditions. In this paper we find evidence that the degree of conglomeration in an industry is negatively related to the industry factors of growth opportunities and concentration, as predicted by value theories. Furthermore, we find that when changes in these factors favor the placement of an increasing fraction of units in an industry under a conglomerate structure, the excess value of conglomerates in that industry is higher. These results suggest that value motives can at least partially explain the conglomeration decision. While our results provide support for value-motivated conglomeration for many firms, they do not rule out agency considerations as a motive for conglomeration for others.

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# Appendix

## Construction of the industry excess value measure OLS-EV

This measure uses an ordinary least squares (OLS) regression approach, where a separate regression is performed for each year. To estimate the fifty industry values of *OLS-EV* for a particular year, only conglomerates with valid divisional assets in one of the 50 industries in that year are retained. Fifty industry variables (*Ind1*-*Ind50*) are then coded for each division year, where each division's asset weight within the conglomerate is assigned to the corresponding industry variable, and the remaining industry variables are set to zero. The table below provides an illustration using the example listed in the text for *Weighted-EV*, assuming all of each firm's assets not allocated to industry *1* are instead allocated to industry *2* (i.e. *X* allocates 50 to industry *2*, while *Y* allocates 700).

| Observation | Conglomerate | Dependent variable | Regressors | | |
|---|---|---|---|---|---|
| | | | *Ind1* | *Ind2* | *Ind3...Ind50* |
| 1 | *X* | $CEV_X$ | (150/200) | (50/200) | 0 … 0 |
| 2 | *Y* | $CEV_Y$ | (300/1000) | (700/1000) | 0 … 0 |

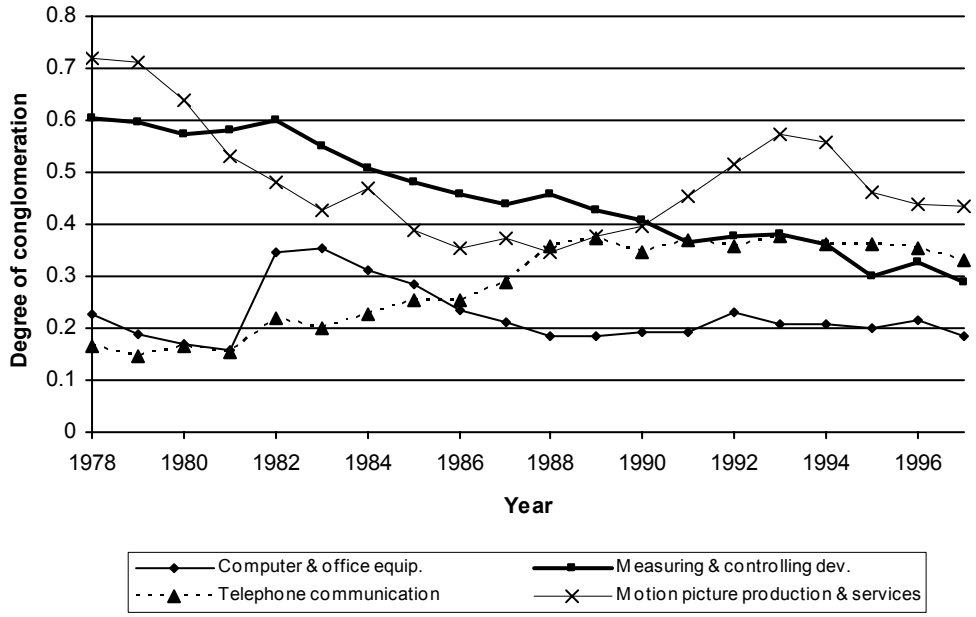
When a conglomerate contains a division operating outside of the 50 industries we consider, the weights for the divisions that *are* among the 50 are rescaled so the sum of the *Ind1* through *Ind50* for a given firm will always equal 1. Results are robust, however, if we do not rescale the industry weights. OLS regressions are estimated for each year with no intercept term, and the resulting 50 coefficients are used as each year's 50 industry excess values. The total number of observations in a given year's regression equals the total number of conglomerates with at least one division in the 50 industries. Observation sizes for the 20

regressions (one for each year) range from 616 to 1,112, and adjusted *R*-squared values range from 0.033 to 0.207 (all but two regressions have adjusted R-squared values exceeding 0.06).

## Figure 1

## Conglomeration levels in four selected industries during 1978-1997

Industries are defined at the 3-digit SIC code level. The conglomeration level is the number of conglomerate divisions operating in the industry divided by the sum of the number of conglomerate divisions and stand-alone firms operating in the industry.



## Table 1

## Industry characteristics in 1980 and 1985

This table reports variable identities for 50 three-digit SIC industries in 1980 and 1995. *Cong* is the conglomeration level, defined as the number of divisions in the industry divided by the total number of divisions and stand-alone firms in the industry. *IndMB* is the median market-to-book ratio for stand-alone firms in the industry. *IndHerf* is an asset-based *Herfindahl* index for conglomerate divisions and stand-alone firms in the industry. *Wtd-EV* is the industry's excess value using an asset-weighted average method that weights conglomerate excess values by the division's asset weight within the parent firm.

| | 1980 | | | | 1995 | | | |
|---|---|---|---|---|---|---|---|---|
| Industry name | Cong | IndMB | IndHerf | Wtd-EV | Cong | IndMB | IndHerf | Wtd-EV |
| Aircraft and parts | 0.87 | 1.41 | 0.06 | -0.18 | 0.70 | 0.71 | 0.07 | 0.17 |
| Beverages | 0.69 | 0.64 | 0.06 | 0.05 | 0.45 | 1.50 | 0.07 | 0.12 |
| Blast furnace and basic steel products | 0.82 | 0.67 | 0.05 | -0.26 | 0.51 | 0.82 | 0.06 | 0.02 |
| Commercial printing | 0.72 | 0.64 | 0.14 | 0.02 | 0.38 | 1.26 | 0.15 | -0.11 |
| Communications equipment | 0.69 | 1.40 | 0.08 | -0.10 | 0.30 | 2.16 | 0.09 | -0.39 |
| Computer and data processing services | 0.47 | 1.71 | 0.15 | -0.28 | 0.16 | 2.70 | 0.14 | -0.31 |
| Computer and office equipment | 0.17 | 1.54 | 0.13 | -0.46 | 0.20 | 2.16 | 0.08 | -0.57 |
| Construction and related machinery | 0.87 | 0.78 | 0.05 | 0.01 | 0.78 | 1.17 | 0.07 | -0.29 |
| Crude petroleum and natural gas | 0.58 | 4.16 | 0.03 | -0.30 | 0.50 | 1.24 | 0.04 | -0.05 |
| Drugs | 0.68 | 2.65 | 0.04 | -0.52 | 0.18 | 3.46 | 0.04 | -0.41 |
| Eating and drinking places | 0.59 | 0.93 | 0.06 | -0.09 | 0.24 | 1.28 | 0.09 | -0.33 |
| Electric lighting and wiring equipment | 0.80 | 0.75 | 0.12 | -0.01 | 0.61 | 1.14 | 0.13 | -0.26 |
| Electrical goods | 0.66 | 0.62 | 0.09 | 0.19 | 0.49 | 1.20 | 0.08 | -0.16 |
| Electrical industrial apparatus | 0.76 | 1.29 | 0.24 | -0.24 | 0.66 | 1.48 | 0.13 | -0.25 |
| Electronic components and accessories | 0.62 | 1.47 | 0.04 | -0.10 | 0.31 | 1.91 | 0.05 | -0.32 |
| Fabricated structural metal products | 0.82 | 0.79 | 0.07 | -0.06 | 0.59 | 1.21 | 0.04 | -0.23 |
| General industrial machinery | 0.78 | 0.96 | 0.04 | -0.03 | 0.60 | 1.25 | 0.04 | -0.12 |
| Gold and silver ores | 0.46 | 4.24 | 0.06 | -0.87 | 0.21 | 1.76 | 0.04 | 0.09 |
| Groceries and related products | 0.70 | 0.60 | 0.06 | 0.07 | 0.38 | 1.00 | 0.23 | 0.20 |
| Grocery stores | 0.53 | 0.63 | 0.06 | -0.09 | 0.19 | 0.87 | 0.04 | -0.04 |
| Hotels and motels | 0.67 | 0.90 | 0.11 | -0.01 | 0.44 | 1.08 | 0.06 | 0.10 |
| Industrial organic chemicals | 0.80 | 1.81 | 0.07 | -0.64 | 0.83 | 1.39 | 0.04 | -0.06 |
| Machinery, equipment, and supplies | 0.85 | 1.14 | 0.03 | -0.21 | 0.54 | 0.93 | 0.07 | 0.05 |
| Measuring and controlling devices | 0.57 | 1.38 | 0.04 | -0.24 | 0.30 | 1.73 | 0.05 | -0.39 |
| Medical instruments and supplies | 0.48 | 2.11 | 0.06 | -0.31 | 0.24 | 2.55 | 0.05 | -0.07 |
| Metalworking machinery | 0.79 | 0.98 | 0.05 | -0.16 | 0.67 | 1.07 | 0.13 | -0.26 |
| Misc. amusement, recreation services | 0.54 | 1.37 | 0.05 | -0.22 | 0.35 | 1.21 | 0.04 | 0.11 |
| Misc. electrical equipment & supplies | 0.63 | 1.92 | 0.10 | -0.55 | 0.48 | 1.36 | 0.10 | -0.01 |
| Misc. fabricated metal products | 0.79 | 1.00 | 0.05 | -0.18 | 0.71 | 0.97 | 0.07 | -0.10 |
| Misc. chemical products | 0.79 | 2.03 | 0.16 | -0.41 | 0.59 | 1.51 | 0.08 | 0.05 |
| Misc. durable goods | 0.63 | 0.68 | 0.15 | -0.34 | 0.55 | 1.31 | 0.09 | -0.03 |
| Misc. manufactures | 0.73 | 0.80 | 0.10 | -0.03 | 0.48 | 0.95 | 0.24 | -0.31 |
| Motion picture production & services | 0.64 | 0.98 | 0.12 | -0.09 | 0.46 | 1.27 | 0.13 | 0.19 |
| Motor vehicles and equipment | 0.70 | 0.70 | 0.12 | -0.22 | 0.54 | 1.11 | 0.09 | -0.12 |
| Nonferrous rolling and drawing | 0.77 | 1.15 | 0.20 | -0.44 | 0.57 | 1.09 | 0.18 | -0.05 |

# Table 1
# (continued)

| Industry name | 1980 | | | | 1995 | | | |
|---|---|---|---|---|---|---|---|---|
| | Cong | IndMB | IndHerf | Wtd-EV | Cong | IndMB | IndHerf | Wtd-EV |
| Nonstore retailers | 0.68 | 0.76 | 0.13 | -0.05 | 0.33 | 1.66 | 0.07 | -0.32 |
| Oil and gas field services | 0.79 | 2.31 | 0.05 | -0.33 | 0.61 | 1.42 | 0.07 | 0.08 |
| Paper mills | 0.81 | 0.76 | 0.03 | -0.07 | 0.80 | 1.33 | 0.04 | -0.24 |
| Petroleum refining | 0.80 | 1.00 | 0.06 | -0.41 | 0.81 | 0.93 | 0.07 | -0.15 |
| Photographic equipment and supplies | 0.67 | 1.23 | 0.20 | -0.04 | 0.38 | 1.21 | 0.13 | 0.07 |
| Professional & commercial equipment | 0.43 | 0.77 | 0.20 | -0.31 | 0.35 | 1.05 | 0.05 | -0.21 |
| Radio and television broadcasting | 0.82 | 1.37 | 0.32 | -0.09 | 0.58 | 1.77 | 0.06 | 0.10 |
| Refrigeration and service machinery | 0.78 | 0.93 | 0.38 | -0.18 | 0.64 | 1.45 | 0.06 | -0.05 |
| Search and navigation equipment | 0.70 | 1.45 | 0.10 | -0.15 | 0.79 | 0.96 | 0.16 | -0.32 |
| Soap, cleaners, and toilet goods | 0.72 | 0.96 | 0.07 | -0.31 | 0.49 | 1.74 | 0.06 | -0.21 |
| Special industry machinery | 0.80 | 0.93 | 0.03 | -0.12 | 0.43 | 1.98 | 0.05 | -0.44 |
| Telephone communication | 0.17 | 0.79 | 0.16 | -0.09 | 0.36 | 1.56 | 0.05 | -0.07 |
| Toys and sporting goods | 0.75 | 0.54 | 0.05 | -0.06 | 0.30 | 1.34 | 0.11 | -0.41 |
| Trucking & courier services, excl. air | 0.66 | 0.60 | 0.06 | -0.06 | 0.48 | 1.05 | 0.35 | -0.21 |
| Variety stores | 0.57 | 0.66 | 0.13 | 0.02 | 0.36 | 0.60 | 0.16 | -0.02 |

## Table 2
## Summary statistics for key variables

Statistics are shown for 50 three-digit SIC industries in each year and overall across all years. *Cong* (conglomeration level) is the number of divisions in an industry divided by the total number of divisions and single-segment firms in the industry. *IndMB* is the median market-to-book ratio for single-segment firms in the division's industry. *IndHerf* is an asset-based *Herfindahl* index for conglomerate divisions and stand-alone firms in the industry. *Weighted-EV* is the industry's excess value using an asset-weighted weighted average method that weights conglomerate excess values by the division's asset weight within the parent firm. *OLS-EV* uses an ordinary least squares regression approach (one regression for each year) to construct industry excess values. For a given year, all conglomerates operating in at least one of the 50 industries are retained. For each conglomerate year, the dependent variable is the conglomerate's excess value. Fifty industry-specific regressor variables are then coded (if the conglomerate has a division in a relevant industry, the asset-weight of the division is assigned, and 0 is assigned for all remaining industry regressors for which the conglomerate has no division, and then weights are rescaled so they sum to 1). The OLS coefficients are then used as the industry excess values.

| | Cong (Conglomeration level) | | | IndMB (Industry Market-to-Book) | | | IndHerf (Industry Herfindahl index) | | | Weighted-EV (Weighted-Excess value) | | | OLS-EV (OLS-Excess value) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Mean | Med | Std Dev | Mean | Med | Std Dev | Mean | Med | Std Dev | Mean | Med | Std Dev | Mean | Med | Std Dev |
| 78 | 0.70 | 0.73 | 0.15 | 0.94 | 0.87 | 0.35 | 0.10 | 0.07 | 0.08 | -0.11 | -0.09 | 0.16 | -0.10 | -0.08 | 0.20 |
| 79 | 0.69 | 0.73 | 0.16 | 1.06 | 0.88 | 0.66 | 0.10 | 0.07 | 0.08 | -0.15 | -0.13 | 0.16 | -0.14 | -0.09 | 0.27 |
| 80 | 0.68 | 0.70 | 0.15 | 1.24 | 0.97 | 0.78 | 0.10 | 0.07 | 0.07 | -0.19 | -0.16 | 0.20 | -0.18 | -0.14 | 0.30 |
| 81 | 0.66 | 0.68 | 0.16 | 1.09 | 0.98 | 0.45 | 0.10 | 0.07 | 0.07 | -0.19 | -0.16 | 0.19 | -0.18 | -0.14 | 0.20 |
| 82 | 0.64 | 0.65 | 0.15 | 1.15 | 0.98 | 0.57 | 0.11 | 0.07 | 0.09 | -0.16 | -0.15 | 0.19 | -0.14 | -0.11 | 0.22 |
| 83 | 0.62 | 0.64 | 0.16 | 1.35 | 1.16 | 0.52 | 0.11 | 0.07 | 0.08 | -0.21 | -0.20 | 0.17 | -0.20 | -0.19 | 0.18 |
| 84 | 0.61 | 0.63 | 0.17 | 1.16 | 1.04 | 0.39 | 0.11 | 0.07 | 0.08 | -0.18 | -0.16 | 0.16 | -0.17 | -0.15 | 0.18 |
| 85 | 0.57 | 0.58 | 0.17 | 1.24 | 1.18 | 0.40 | 0.11 | 0.08 | 0.08 | -0.17 | -0.18 | 0.15 | -0.16 | -0.17 | 0.15 |
| 86 | 0.55 | 0.56 | 0.18 | 1.25 | 1.14 | 0.44 | 0.11 | 0.08 | 0.08 | -0.18 | -0.16 | 0.15 | -0.17 | -0.15 | 0.18 |
| 87 | 0.54 | 0.53 | 0.18 | 1.12 | 1.05 | 0.32 | 0.11 | 0.08 | 0.08 | -0.11 | -0.10 | 0.18 | -0.10 | -0.07 | 0.18 |
| 88 | 0.53 | 0.54 | 0.17 | 1.10 | 1.04 | 0.29 | 0.11 | 0.08 | 0.07 | -0.08 | -0.08 | 0.11 | -0.07 | -0.07 | 0.14 |
| 89 | 0.52 | 0.52 | 0.17 | 1.13 | 1.05 | 0.32 | 0.11 | 0.08 | 0.08 | -0.10 | -0.08 | 0.13 | -0.09 | -0.08 | 0.17 |
| 90 | 0.51 | 0.51 | 0.17 | 0.98 | 0.90 | 0.31 | 0.11 | 0.09 | 0.07 | -0.11 | -0.10 | 0.13 | -0.08 | -0.08 | 0.16 |
| 91 | 0.52 | 0.50 | 0.18 | 1.13 | 1.04 | 0.47 | 0.10 | 0.08 | 0.07 | -0.10 | -0.07 | 0.16 | -0.09 | -0.08 | 0.20 |
| 92 | 0.52 | 0.52 | 0.18 | 1.26 | 1.12 | 0.44 | 0.10 | 0.08 | 0.06 | -0.16 | -0.17 | 0.19 | -0.13 | -0.13 | 0.19 |
| 93 | 0.51 | 0.50 | 0.18 | 1.46 | 1.46 | 0.47 | 0.10 | 0.08 | 0.06 | -0.16 | -0.16 | 0.16 | -0.14 | -0.15 | 0.17 |
| 94 | 0.50 | 0.50 | 0.18 | 1.31 | 1.28 | 0.35 | 0.10 | 0.07 | 0.07 | -0.12 | -0.14 | 0.14 | -0.12 | -0.11 | 0.14 |
| 95 | 0.48 | 0.48 | 0.18 | 1.40 | 1.27 | 0.53 | 0.09 | 0.07 | 0.06 | -0.13 | -0.11 | 0.19 | -0.13 | -0.10 | 0.21 |
| 96 | 0.47 | 0.46 | 0.18 | 1.39 | 1.26 | 0.46 | 0.09 | 0.07 | 0.06 | -0.11 | -0.13 | 0.17 | -0.10 | -0.10 | 0.17 |
| 97 | 0.44 | 0.44 | 0.18 | 1.45 | 1.36 | 0.43 | 0.09 | 0.07 | 0.07 | -0.09 | -0.10 | 0.19 | -0.07 | -0.07 | 0.18 |
| All years | 0.56 | 0.58 | 0.18 | 1.21 | 1.10 | 0.48 | 0.10 | 0.08 | 0.07 | -0.14 | -0.13 | 0.17 | -0.13 | -0.12 | 0.19 |

## Table 3
## Panel data regression results

Panel *A* reports a panel data regression predicting industry conglomeration levels (dependent variable = *Cong*). An industry's conglomeration level is the number of divisions in the industry divided by the total number of divisions and single-segment firms in the industry. *IndMB* is the median market-to-book ratio for single-segment firms in the industry. *IndHerf* is an asset-based *Herfindahl* index for conglomerate divisions and single-segment firms in the industry. Panel *B* reports panel regressions predicting two measures of industry excess values. *Weighted-EV* is the industry's excess value using an asset-weighted average method that weights conglomerate excess values by the division's asset weight within the parent firm. *OLS-EV* uses an ordinary least squares regression approach (one regression for each year) to construct industry excess values. For a given year, all conglomerates operating in at least one of the 50 industries are retained. For each conglomerate year, the dependent variable is the conglomerate's excess value. Fifty industry-specific regressor variables are then coded (if the conglomerate has a division in a relevant industry, the asset-weight of the division is assigned, and 0 is assigned for all remaining industry regressors for which the conglomerate has no division). The OLS coefficients are then used as the industry excess values. *ValueCong1* is the value-related conglomeration level, for which we use the predicted conglomeration level from Model A1 in Panel A. *ResidCong1 = Cong – ValueCong1*, the residual from model *A1*. All models in both panels use a panel data approach with two-way fixed effects (i.e. industry and year dummies are included, although not reported below), and have 1000 observations (50 industries, 20 years). Heteroskedasticity and autocorrelation-consistent *t*-values appear in parentheses below the coefficients.

Panel *A*: Regression predicting industry conglomeration (dependent variable = *Cong*)

| Model | *A1* |
|---|---|
| *IndMB* | -0.009 |
| | (-1.97) |
| *IndHerf* | -0.116 |
| | (-2.68) |
| Adj. R-squared | 0.85 |

Panel *B*: Regressions predicting industry excess value (dependent variable = *Weighted-EV* or *OLS-EV*)

| Model<br>Dep. Var. | *B1*<br>*Weighted-EV* | *B2*<br>*OLS-EV* | *B3*<br>*Weighted-EV* |
|---|---|---|---|
| *ValueCong1* | 8.01 | 10.07 | 8.03 |
| | (8.33) | (8.73) | (8.32) |
| *ResidCong1* | - | - | –0.04 |
| | - | - | (–0.53) |
| Adj. R-squared | 0.19 | 0.17 | 0.19 |

## Table 4
## Robustness of regression results

Panel *A* reports panel data regressions predicting industry conglomeration levels (dependent variable = *Cong*). An industry's conglomeration level is the number of divisions in the industry divided by the total number of divisions and single-segment firms in the industry. *IndMB* is the median market-to-book ratio for single-segment firms in the industry. *IndHerf* is an asset-based *Herfindahl* index for conglomerate divisions and single-segment firms in the industry. *Lag(IndMB)* and *Lag(IndHerf)* are *IndMB* is and *IndHerf* lagged by one year. Panel *B* reports panel data regressions predicting *Weighted-EV,* which is the industry's excess value using an asset-weighted average method that weights conglomerate excess values by the division's asset weight within the parent firm. *ValueCong2* is the predicted conglomeration level from Model *A2* in Panel *A* in this table. *ValueCong1* is the predicted conglomeration level from Model *A1* in Table 3. All models in both panels use a panel data approach with two-way fixed effects (i.e. industry and year dummies are included, although not reported below), and have 1000 observations (50 industries, 20 years). Heteroskedasticity and autocorrelation-consistent *t*-values appear in parentheses below the coefficients.

Panel *A*: Regressions predicting industry conglomeration (dependent variable = *Cong*)

| Model | *A2* |
|---|---|
| *IndHerf* | –0.113 |
| | (–2.61) |
| Adj. R-squared | 0.85 |

Panel *B*: Regressions predicting industry excess value (dependent variable = *Weighted-EV*)

| Model | *B4* | *B5* |
|---|---|---|
| *ValueCong2* | 5.62 | - |
| | (3.46) | - |
| *ValueCong1* | - | 2.87 |
| | - | (3.21) |
| *IndMB* | - | –0.21 |
| | - | (–9.92) |
| Adj. R-squared | 0.21 | 0.35 |