

## DO ANALYSTS ADD VALUE WHEN THEY MOST CAN? EVIDENCE FROM CORPORATE SPIN-OFFS

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*This article investigates how securities analysts help investors understand the value of diversification. By studying the research that analysts produce about companies that have announced corporate spin-offs, we gain unique insights into how analysts portray diversified firms to the investment community. We find that while analysts' research about these companies is associated with improved forecast accuracy, the value of their research about the spun-off subsidiaries is more limited. For both diversified firms and their spun-off subsidiaries, analysts' research is more valuable when information asymmetry between the management of these entities and investors is higher. These findings contribute to the corporate strategy literature by shedding light on the roots of the diversification discount and by showing how analysts' research enables investors to overcome asymmetric information. Copyright © 2013 John Wiley & Sons, Ltd.*

### INTRODUCTION

Do investors understand the value of corporate diversification? The recent wave of conglomerate breakups in response to undervaluation in the stock market seems to suggest they do not.<sup>1</sup> This sentiment is echoed in academic research on diversification, in which a key explanation for the so-called 'diversification discount' is the existence of asymmetric information between the management of diversified firms and outside investors.

As intermediaries between companies' management and investors, securities analysts should help reduce this information asymmetry. Yet, several studies have found that analysts themselves may,

in fact, contribute to, rather than mitigate, the discount at which diversified firms trade relative to their focused peers (Zuckerman, 1999; Gilson *et al.*, 2001).

While existing explanations attribute analysts' difficulties in covering diversified firms to the institutional characteristics of securities research, in reality, little is known about how analysts go about portraying diversified firms to the capital market. The answer to this question is important because it can help explain why investors might not understand the value of diversification and, hence, why diversified firms may be undervalued in the first place.

Using a proprietary data set that includes both quantitative and qualitative information about analysts' coverage of diversified firms that undertake corporate spin-offs, we open the 'black box' of how analysts process information about diversified firms. Spin-offs are a useful empirical context in which to investigate this issue because once they have been announced, analysts must begin producing research about the two new entities created in

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<sup>1</sup> Recent examples of diversified companies breaking apart their component businesses include Fortune Brands, ITT, Tyco, Kraft, McGraw-Hill, Ralcorp, Motorola, and Sara Lee.

these transactions—the spun-off subsidiaries and the remaining operations of their diversified parent companies. Thus, by studying analysts' research about firms that have announced spin-offs, we gain unique insights into how analysts go about understanding both the component parts of diversified firms and their combined value, thereby shedding light on the roots of the diversification discount.

This study generates two main results. First, the value of analysts' research is significantly more limited for spun-off subsidiaries than it is for their diversified parent companies. While much of the research that analysts produce about diversified firms is associated with more accurate earnings forecasts, the only type of research that improves forecast accuracy for spun-off subsidiaries is when analysts explicitly study the parent companies' pre-spin-off segments. Second, for both the diversified firms and their spun-off subsidiaries, analysts' research is particularly valuable to investors when the characteristics of these entities make them more difficult to cover, that is, when information asymmetry is higher.

Taken together, these findings suggest that investors may misvalue diversified firms because analysts do not perform the detailed research about these firms that would be required to understand them. In situations where analysts do produce this kind of research, their work appears to play a key role in enabling investors to overcome the information asymmetry they experience vis-à-vis the managers of diversified firms.

## THEORY AND HYPOTHESES

The value of corporate diversification has been the subject of significant debate over the past two decades. While early research found diversified firms as a whole to be worth less than the sum of their parts (Lang and Stulz, 1994; Berger and Ofek, 1995), subsequent research has questioned both this finding and its attribution to diversification (Villalonga, 2004a, 2004b). It is worth noting, however, that the focus of this debate has been on the average effect of diversification on firm value. Scholars on both sides of the debate have found significant variance across diversified firms in the discounts and premia at which they trade relative to single-segment firms, yet the sources of this variance have received much less attention.

One reason investors may undervalue diversified firms is that information about these companies is either skewed or insufficient. For instance, Villalonga (2004b) finds that the diversification discount is contingent on how firms' operations are broken down into segments. Moreover, various studies have established that diversified firms that undertake unrelated diversification or 'unique' corporate strategies are difficult for investors to understand (Bergh, Johnson, and Dewitt, 2008; Litov, Moreton, and Zenger, 2012).

As intermediaries between managers and investors, securities analysts are in a position to help reduce the asymmetry of information between these two groups of actors (Givoly and Lakonishok, 1979; Francis and Soffer, 1997). However, the existing literature has shown that analysts themselves have difficulty evaluating diversified firms. Producing research about diversified firms is costly for analysts, reducing both the quality of their work and their incentive to cover these companies (Bhushan, 1989). Moreover, analysts specialize by industry, but diversified firms operate in multiple industries, resulting in a mismatch between these companies' operations and analysts' expertise (Zuckerman, 1999, 2000; Gilson *et al.*, 2001). Finally, diversification causes firms to depart from their 'traditional' strategies, and analysts are often unable or unwilling to devote effort to understanding these new endeavors (Benner, 2010; Benner and Ranganathan, 2012; Litov *et al.*, 2012).

While prior research appears to attribute analysts' inability to produce high-quality research about diversified firms to inappropriate expertise or simple lack of effort, no study has yet explored in any detail what kinds of research securities analysts perform about diversified firms and how this research influences their ability to produce accurate forecasts for these companies. The answers to these questions are important because they shed light on why the diversification discount might exist in the first place and whether analysts can help investors overcome the information asymmetry they experience vis-à-vis diversified firms.

Corporate spin-offs—transactions in which diversified companies divest business units by distributing shares in them *pro rata* to shareholders<sup>2</sup>—are a useful empirical context in which to

<sup>2</sup> Corporate spin-offs are distinct from entrepreneurial spin-offs (also known as spin-outs or spawns), in which a group of

investigate these issues. Once a spin-off has been announced, analysts must begin evaluating the separate operations of the two new companies created from the diversified firm they used to cover: the spun-off subsidiary and the remaining operations of the divesting parent company. This is important because analysts do not usually disaggregate their research in this manner, meaning that spin-offs provide unique insights into how analysts understand the value of both diversified firms and their component parts.

The amount of information analysts incorporate into their reports about both diversified firms and spun-off subsidiaries is likely to help them make accurate forecasts about these entities' future performance (Mikhail, Walther, and Willis, 2003). Information on a firm's expected future financial condition, such as growth forecasts and *pro forma* financial statements, is a key input into the production of accurate forecasts.

*Hypothesis 1a (H1a): The more pro forma forecasts analysts make about diversified parent companies, the more accurate their earnings forecasts about these firms will be.*

*Hypothesis 1b (H1b): The more pro forma forecasts analysts make about spun-off subsidiaries, the more accurate their earnings forecasts about these units will be.*

Moreover, when analysts attempt to understand the pre-spin-off conditions in diversified firms (such as why these companies are undertaking spin-offs, how large the diversification discount is, or how the pre-spin-off operations of their segments function), the accuracy of the forecasts they make about diversified firms and spun-off units will be higher.

*Hypothesis 2a (H2a): When analysts produce research about why diversified companies undertake spin-offs, their earnings forecasts for these firms will be more accurate.*

*Hypothesis 2b (H2b): When analysts produce research about the magnitude of the*

*diversification discount, their earnings forecasts for diversified firms will be more accurate.*

*Hypothesis 2c (H2c): When analysts produce research about diversified firms' business segments, their earnings forecasts for the spun-off subsidiaries will be more accurate.*

To the extent that analysts' research about diversified firms and their spun-off subsidiaries helps investors understand these companies' expected future performance, this benefit is likely to be even more substantial when information asymmetry about these entities is high. Both private and newly public firms have been shown to suffer from high information asymmetries vis-à-vis the external counterparts with which they must transact (Capron and Shen, 2007; Sanders and Boivie, 2004; Arikian and Capron, 2010). To mitigate the negative impact of these asymmetries, private firms sometimes undergo initial public offerings (IPOs) before undertaking mergers and acquisitions to release information about themselves (Reuer and Shen, 2004; Reuer and Ragozzino, 2008). For similar reasons, the research that analysts produce about diversified parent companies and their spun-off subsidiaries—which have no trading history and, hence, no prior analyst coverage as stand-alone companies—should be especially valuable to actual or potential investors in these entities.

The asymmetry of information between management and investors is known to be particularly high in diversified firms. While the resource-based view holds that diversification allows firms to leverage key resources and capabilities (Penrose, 1959; Rumelt, 1974; Helfat and Eisenhardt, 2004; Levinthal and Wu, 2010), corporate managers are often unable to articulate what that core competence or 'parenting advantage' actually is (Pralhad and Bettis, 1986; Porter, 1987; Goold, Campbell, and Alexander, 1994; Prahalad and Doz, 2003).<sup>3</sup> Moreover, managers might take advantage of this opacity by making inefficient diversification decisions that serve their own private objectives (Amihud and Lev, 1981; Jensen, 1986; Scharfstein and

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employees founds a new venture in the same industry as their former parent company.

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<sup>3</sup> This may provide one explanation for the importance attributed to business unit and industry effects relative to corporate effects in determining profitability differences (Schmalensee, 1985; Rumelt, 1991; McGahan and Porter, 1997), as well as the scarcity of studies finding large and significant corporate effects (Wernerfelt and Montgomery, 1988; Bowman and Helfat, 2001).

Stein, 2000).<sup>4</sup> Investors are likely to experience these kinds of information asymmetry acutely, suggesting that the value of analysts' research will increase with a firm's level of diversification.

*Hypothesis 3a (H3a): The impact of analysts' research on parent forecast accuracy will be greater for more highly diversified firms.*

Additionally, corporate spin-offs are extraordinarily complex transactions, necessitating the separation of formal and informal linkages between the divesting parent companies and their spun-off subsidiaries, including common resources (Woo, Willard, and Daellenbach, 1992), residual ties among top management teams and boards of directors (Seward and Walsh, 1996; Semadeni and Cannella, 2011), shared debt and corporate overhead (Gilson, 2000), and connections in the identities and reputations of the new entities (Corley and Gioia, 2004). Investors are likely to have difficulty understanding the full ramifications of these changes for the parent company, which will be more pronounced when a large part of the firm is being spun off (Bergh, 1995). Thus, the value of analysts' research should increase with the size of a spin-off.

*Hypothesis 3b (H3b): The impact of analysts' research on parent forecast accuracy will be greater when firms spin off larger subsidiaries.*

Finally, diversified parent companies often undertake spin-offs to restructure themselves (Hoskisson, Johnson, and Moesel, 1994). One way in which firms might accomplish this is to undertake several spin-offs at the same time. However, investors are likely to find it difficult to understand the full implications of simultaneously implemented spin-offs. Thus, the value of analysts' research will be greater when firms undertake multiple spin-offs at the same time.

*Hypothesis 3c (H3c): The impact of analysts' research on parent forecast accuracy will be*

*greater when firms spin off multiple subsidiaries simultaneously.*

Turning now to spun-off subsidiaries, these entities typically have no stock price history as independent companies,<sup>5</sup> meaning that investors are likely to find it difficult to evaluate their future prospects. Thus, the value of analysts' research will be higher when spun-off subsidiaries have no stock price history.

*Hypothesis 4a (H4a): The impact of analysts' research on subsidiary forecast accuracy will be greater when spun-off units have no stock price history.*

Similarly, both small subsidiaries and subsidiaries that operate in industries different from those of their parent companies are likely to be quite opaque to investors, as analysts are unlikely to have exerted much effort in covering them in the past (Bhushan, 1989). Indeed, this factor is often the reason why firms undertake spin-offs in the first place (Krishnaswami and Subramaniam, 1999; Zuckerman, 2000; Bergh *et al.*, 2008). Thus, analysts' research will be more valuable for small and unrelated spun-off subsidiaries.

*Hypothesis 4b (H4b): The impact of analysts' research on subsidiary forecast accuracy will be greater when spun-off units are smaller.*

*Hypothesis 4c (H4c): The impact of analysts' research on subsidiary forecast accuracy will be greater when spun-off units are not in the same industry as their parent firms.*

## METHODS

### Sample and data

Our sample consists of 1,793 analyst reports written about companies involved in a random sample of 62 spin-offs announced and completed from 1985 to 2001.

<sup>4</sup>These behaviors are similar in spirit to Villalonga's (2004b) idea of 'strategic accounting,' in which firms aggregate their activities for reporting purposes so as to avoid disclosing information about the profitability of their segment-level operations to competitors.

<sup>5</sup>The sole occasion in which a spun-off subsidiary might have a stock price history is when the divesting parent company created a tracking stock for it before spinning it off. Instances of this behavior will be used to represent spun-off subsidiaries in which more information is available to investors.

The dataset was constructed as follows: first, an initial sample of spin-offs was retrieved from the Securities Data Corporation (SDC) Mergers and Acquisitions database. Specifically, we searched for all completed divestitures of U.S. targets (i.e., subsidiaries) to parent company shareholders, announced after January 1, 1985 and effective before December 31, 2001. Additionally, the stock of these targets could not already be trading separately in the market due to an earlier equity carve out (e.g., Agilent from Hewlett-Packard or Lucent from AT&T). This yielded a sample of 350 transactions.

Second, we used Compustat to obtain financial data for the parent and subsidiary companies in the effective years of each of these 350 spin-offs. Data on sales, assets, and market value for both the parent and subsidiary companies were available for 267 of these spin-offs.<sup>6</sup> This number, as well as the other numbers of transactions reported so far, refers to the number of new companies that were spun off. Because some transactions involve the simultaneous spin-off of more than one subsidiary by the parent (e.g., Dun & Bradstreet's double divestiture of A.C. Nielsen and Cognizant),<sup>7</sup> the actual number of deals is lower (254).

Out of the 254 deals, we randomly selected 66 as our final sample for analysis, in which four deals were double divestitures and one deal was a triple divestiture. For each of these 66 deals, we retrieved from Investext all analyst reports that were issued about the parent, the subsidiary, or both, during the time period ranging from one month prior to the announcement date to one month after the effective date. When a deal was a multiple divestiture, we selected all reports issued about the parent or any of the subsidiaries during the time period ranging from one month prior to the earliest announcement

date to one month after the latest effective date. This process yielded a sample of 2,512 reports.

Of these 2,512 analyst reports, we eliminated those that were issued prior to the spin-off announcement date, when analysts may not have been aware that it was coming, or after the effective date, when the spun-off entity began trading independently and analysts therefore had actual stock prices to guide their analysis. Within the remaining 1,932 reports, 139 more were identified as duplicate reports and removed, leaving a final sample of 1,793 reports. These eliminations resulted in the removal of four more deals from the sample, as all the reports on the parties to these transactions were written either before the announcement date or after the effective date. Thus, the 1,793 reports analyzed in this article cover 62 transactions in total, representing 52 parent companies due to multiple spin-off transactions.

The third and most distinctive step in our data collection process consisted of reading the 1,793 analyst reports in their entirety (10,160 pages altogether) and manually coding their content. Specifically, for both parents and subsidiaries, we gathered data on the types of financial analyses conducted and valuation methods employed, the earnings and price forecasts made, the types of analyses performed about each spin-off, and analyst sentiment about the parent company and the spin-off.

Given the magnitude of this task, we hired and trained a team of advanced undergraduate students with financial knowledge to gather these data. Several steps were taken to ensure the reliability of the data they collected. First, to verify the quality of their work, the reports pertaining to several spin-offs were assigned to more than one student (unknownst to them), so that each student's work was cross-checked by at least one other student.<sup>8</sup> When discrepancies were found, we personally checked the original analyst reports to ascertain which student was mistaken and instructed him/her to correct the mistakes in that and any other reports he/she had coded. Second, to ensure consistency across students in the way the more subjective information was coded, we had a different student go over the coding of the qualitative items across

<sup>6</sup> In addition to company names and CUSIPs from SDC and Compustat, we used information from the Center for Research on Security Prices (CRSP)-Compustat Header File, the CCH Capital Changes Reporter, and the Securities and Exchange Commission (SEC) Web site (which lists firms' former names) to maximize the number of merged SDC-Compustat observations. Whenever data were not available for the spin-off's effective year, we used data from the latest year in which the parent company's old stock was listed in Compustat, and/or from the first year in which the spun-off company was included in Compustat (as far as two years before or after the spin-off became effective).

<sup>7</sup> We define two or more spin-offs by the same parent as a multiple divestiture when either the announcement or the effective dates of the transactions occur within a week of each other. Choosing a different threshold (e.g., a month or five days, instead of a week) does not make a difference.

<sup>8</sup> As a check on the validity of these data, we ran t-tests comparing the mean values of the variables double coded by each pair of students, and these differences were not statistically significant.

all reports. Third, we had three other students, including a graduate student, go over the entire dataset and recode some of the quantitative items whenever serious errors, omissions, or inconsistencies became apparent. Fourth, we conducted ANOVA tests of whether the mean values of key variables differed according to which of our research assistants coded them, and the F-statistics from these tests (available upon request from the authors) are not statistically different from zero.

Finally, we collected data from Thomson's I/B/E/S, S&P Capital IQ, and *Institutional Investor* magazine about the analysts in our sample and the investment banks they were working for at the time they issued each report.

### Variables

The empirical tests in this article examine how the quality of the research that analysts produce about spun-off subsidiaries and their divesting parent companies influences the accuracy of the forecasts they make about these newly created firms. This subsection of the article, as well as Table 1, describes the variables used to investigate these relationships.

#### *Dependent variable*

We measure EPS forecast error as the absolute value of the difference between forecasted earnings per share (EPS) and actual EPS on the forecast date (i.e., the date to which the forecast refers), scaled by the company's stock price. Higher values of EPS forecast error indicate that a forecast is less accurate and vice versa. For the Parent EPS forecast error variable, we measure the parent company's stock price at the end of the fiscal year prior to the forecast period (Gilson *et al.*, 2001; Agrawal, Chadha, and Chen, 2006). Since spun-off subsidiaries do not have a stock price in the year prior to the forecast, we use the subsidiary's stock price at the end of the first fiscal year in which the stock trades to construct the Subsidiary EPS forecast error variable. We eliminate outliers in which the relevant stock price used to construct these variables is less than \$1 and those for which EPS forecast error is greater than or equal to two (Agrawal *et al.*, 2006).

#### *Analysts' research*

We employ several different variables to test how the research that analysts produce about diversified

parent companies and their spun-off subsidiaries influences forecast accuracy.

Hypotheses 1a and 1b predict that the more *pro forma* forecasts analysts produce about diversified parent companies and their spun-off subsidiaries, the more accurate the earnings forecasts they will make about these entities. To test these predictions, first, # annual EPS forecasts is a count of the number of years for which an analyst forecasts annual EPS for the parent companies and their spun-off subsidiaries. Second, EPS growth forecast is an indicator variable taking the value '1' if an analyst forecasts the expected growth in either of these entities' EPS. Finally, Financial statement index is a count (zero, one, two, or three) of the number of *pro forma* financial statements (balance sheet, income statement, and cash flow statement) produced for either of these units. All of these variables are expected to be negatively associated with Parent EPS forecast error and Subsidiary EPS forecast error in their respective regressions.<sup>9</sup>

Analysis of spin-off rationale is an indicator variable taking the value '1' if an analyst describes the rationale for an upcoming spin-off, and Analysis of conglomerate discount is an indicator variable taking the value '1' if an analyst discusses the conglomerate discount in his/her report. These two variables are expected to be negatively associated with Parent EPS forecast error (Hypotheses 2a and 2b), as they reflect situations in which analysts put more effort into understanding diversified companies.

To test the prediction that the forecasts analysts make about a spun-off subsidiary will be more accurate when they analyze the business segments in its diversified parent company (Hypothesis 2c), Analysis of segments is an indicator variable taking the value '1' if an analyst includes segment-level financial information in his/her reports. This variable should be negatively associated with Subsidiary EPS forecast error.

#### *Firm characteristics and interaction terms*

To test Hypotheses 3a-c, we begin by defining several variables measuring the characteristics of the diversified parent companies. The Herfindahl

<sup>9</sup> As will be discussed, our control variables allow us to rule out the possibility that analysts who produce more research are more motivated or have a greater ability to generate information about upcoming spin-offs.

Table 1. Variable descriptions

| Analysts' research                | Description  |
|-----------------------------------|--|
| # Annual EPS forecasts            | Count of the number of years for which an analyst forecasts annual EPS   |
| EPS growth forecast               | Indicator variable taking the value one if an analyst forecasts EPS growth   |
| Financial statement index         | Number of <i>pro forma</i> financial statements (balance sheet, income statement, and cash flow statement) included in a report  |
| Analysis of spin-off rationale    | Indicator variable taking the value '1' if a report discusses the rationale for the spin-off   |
| Analysis of conglomerate discount | Indicator variable taking the value '1' if a report mentions the conglomerate discount   |
| Analysis of segments              | Indicator variable taking the value '1' if a report provides segment-level financial information   |
| Firm characteristics              | Description  |
| Herfindahl index                  | Sum of the squared shares of a firm's total sales provided by each of its segments   |
| Diversified firm                  | Indicator variable taking the value '1' if the Herfindahl Index exceeds the mean value of its distribution   |
| Relative size                     | Total assets of the spun-off subsidiary divided by the total assets of the parent company  |
| Large spin-off                    | Indicator variable taking the value '1' if Relative Size exceeds the mean value of its distribution  |
| Small spin-off                    | Indicator variable taking the value '1' if Relative Size is less than the mean value of its distribution   |
| Multiple divestiture              | Indicator variable taking the value '1' if a spin-off is part of a multiple divestiture  |
| No tracking stock                 | Indicator variable taking the value '1' if the stock of the spun-off subsidiary did not previously have a tracking stock   |
| Unrelated                         | Indicator variable taking the value '1' if the parent company and its spun-off subsidiary do not share a four-digit SIC code   |
| Additional controls               | Description  |
| Days announce to report date      | Number of days elapsed between announcement of spin-off and the date on which a report is written  |
| Days report to effective date     | Number of days elapsed between the date on which a report is written and the spin-off effective date   |
| Analyst ranking by II             | Categorical variable taking the value '1' if an analyst is a runner-up, '2' if an analyst is ranked third, '3' if an analyst is ranked second, and '4' if an analyst is ranked first by Institutional Investor |
| Analyst advisor                   | Count of the number of deals in the decade preceding a spin-off in which an investment bank also had an advisory relationship  |
| Recommendation                    | Indicator variable taking the value '1' if an analyst makes either a buy or sell recommendation about a company's stock and '0' if he/she makes a neutral or no recommendation                                 |
| ln(Total assets)                  | Natural log of a firm's total assets   |
| Debt/assets                       | Ratio of a firm's total debt to its total assets   |

Index is calculated as the sum of the squared shares of a firm's total sales provided by each of its segments, representing the level of diversification within these firms. Then, Diversified firm is defined as an indicator variable taking the value '1' if the Herfindahl Index exceeds the mean value in its distribution. Similarly, Relative size is the total assets of the spun-off subsidiary over the

total assets of its parent company, and Large spin-off is an indicator variable taking the value '1' if Relative size exceeds the mean value in its distribution. Finally, Multiple divestiture is defined as an indicator variable taking the value '1' if a firm undertakes multiple spin-offs simultaneously.

Having defined these characteristics, we create interaction terms between these indicator variables

(Diversified firm, Large spin-off, and Multiple divestiture) and each of the variables representing analysts' research about the diversified parent firms (# annual EPS forecasts, EPS growth forecast, Financial statement index, Analysis of spin-off rationale, and Analysis of conglomerate discount). These interaction terms represent the value of analysts' research in parent firms where information asymmetry is high. If Hypotheses 3a-c are supported and analysts' research is more valuable in such firms, the coefficients on all of these interaction terms are expected to be negative.

To test Hypotheses 4a-c, we now define several variables measuring the characteristics of the spun-off subsidiaries. First, No Tracking Stock is an indicator variable taking the value '1' if a spun-off subsidiary did not previously have a tracking stock. Returning to the Relative size variable, Small spin-off is defined as an indicator variable taking the value '1' if Relative size is less than the mean value in its distribution. Finally, Unrelated is defined as an indicator variable taking the value '1' if the parent company and its spun-off subsidiary do not share a four-digit SIC code.

We create interaction terms between these three indicator variables (No tracking stock, Small spin-off, and Unrelated) and each of the variables representing analysts' research about the spun-off subsidiaries (# annual EPS forecasts, EPS growth forecast, Financial statement index, and Analysis of segments). These interaction terms represent the value of analysts' research in spun-off subsidiaries where information asymmetry is high. If Hypotheses 4a-c are supported and analysts' research is more valuable in these spun-off subsidiaries, the coefficients on all of these interaction terms should be negative.

### *Control variables*

In addition to the variables just described, we also include several control variables in the upcoming regressions to rule out potential alternative explanations for our results.

The first of these is Days announce to report date, defined as the number of days that elapse from a spin-off's announcement date to the date on which a report was written. This variable accounts for the benefit of analysts having more time to conduct research about the entities involved in upcoming spin-offs. As such, Days announce to report date is expected to be negatively associated

with both Parent and Subsidiary EPS forecast error.

Similarly, Days report to effective date is defined as the number of days that elapse from the date on which a report was written to a spin-off's effective date. This variable is included to represent the possibility that analysts have more information about the implications of an upcoming spin-off the closer to the completion of that transaction they write their reports. Accordingly, Days report to effective date is expected to be positively associated with both Parent and Subsidiary EPS forecast error.

To represent the impact of analysts' reputation on the accuracy of the forecasts they produce, we use Institutional Investor's (II's) analyst rankings, which identify the top three analysts and runners-up in different industrial sectors (Stickel, 1992; Fang and Yasuda, 2009). Analyst Ranking by II takes the value '1' if an analyst is a runner-up, '2' if the analyst is ranked third, '3' if the analyst is ranked second, and '4' if the analyst is ranked first. If reputable analysts produce better research about the firms they cover, Analyst ranking by II should be negatively associated with both Parent and Subsidiary EPS forecast error.

Analyst advisor is a count of the number of deals in the 10 years preceding a spin-off in which the investment bank issuing the analyst report (or a predecessor bank that merged into it) participated as an advisor of some sort (Michael and Womack, 1999).<sup>10</sup> This variable is included because analysts' abilities to provide information to investors may be higher when the investment banks they work for have prior advisory relationships with the same firms they cover. While such relationships are viewed negatively from a regulatory perspective (Agrawal *et al.*, 2006; Kadan *et al.*, 2009), they might, in fact, improve analysts' abilities to make accurate forecasts by increasing the flow of information from companies to the analysts covering them. This implies that Analyst advisor will be negatively associated with both Parent and Subsidiary EPS forecast error.

Recommendation is an indicator variable taking the value '1' if an analyst expresses either a 'buy' or a 'sell' recommendation about a company's stock and '0' if he/she expresses a neutral or no

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<sup>10</sup> 'Deals' include mergers and acquisitions, spin-offs, divestitures, and equity issues.

opinion about that firm. Analysts have a tendency to display mimetic behavior, or ‘herd,’ due to career concerns (Hong, Kubik, and Solomon, 2000; Rao, Greve, and Davis, 2001), reducing their incentive to express strong positive or negative opinions about a company’s stock (Kadan *et al.*, 2009). When analysts do express such opinions, it may reflect confidence in the accuracy of their research, so Recommendation should be negatively associated with both Parent and Subsidiary EPS forecast error.

Finally,  $\ln(\text{Total assets})$  and  $\text{Debt/assets}$  are included in the upcoming regressions to represent the financial conditions of the spun-off subsidiaries and their divesting parent companies. The upcoming regressions also include year fixed effects. Summary statistics and correlation matrices are available upon request from the authors.

## RESULTS

### Methodology

Because not every analyst report includes EPS forecasts for the divesting parent company and the spun-off subsidiary, we use Heckman two-stage models to conduct our analyses of analyst forecast accuracy. Of the 1,793 reports comprising the sample, only 263 of them provide EPS forecasts for the subsidiaries and 1,400 include such forecasts for the parent companies. Consequently, the factors driving analysts to include EPS forecasts in their reports may be correlated in unobserved ways with their ability, or lack thereof, to make accurate forecasts, making Heckman models the appropriate methodology to employ.<sup>11</sup>

Heckman’s estimator requires an instrumental variable that is correlated with analysts’ propensities to include EPS forecasts in their reports, but not with the accuracy of those forecasts. This variable should, therefore, be included in the first-stage specification but excluded from the second. We propose and use as our instrument Subsidiary IPO/parent IPO, the ratio of the dollar value of IPO issues in the subsidiary’s industry to the dollar value of IPO issues in the parent’s industry, both measured in the year in which each analyst report was written. The logic behind this instrument is as

follows: we are unaware of any direct mechanism that would systematically link the relative volume of new equity issues in particular industries to earnings forecast accuracy, so our instrument satisfies the exclusion restriction. However, we expect Subsidiary IPO/parent IPO to be correlated with analysts’ propensities to provide EPS forecasts, in that analysts should include greater detail in their coverage of companies operating in ‘hot’ industries (Rajan and Servaes, 1997).

More specifically, we predict a negative relation between this instrument and Parent EPS forecast inclusion (an indicator variable taking the value ‘1’ if a report contains an EPS forecast for the divesting parent company), because analysts will be more likely to include an EPS forecast about a parent company when it operates in a more active industry, represented by smaller values of Subsidiary IPO/parent IPO. Analogously, we expect a positive relation between the instrument and Subsidiary EPS forecast inclusion (an indicator variable taking the value ‘1’ if a report contains an EPS forecast about a spun-off subsidiary), as analysts will be more likely to make EPS forecasts about subsidiaries operating in more active industries, represented by higher values of Subsidiary IPO/parent IPO.

### Diversified parent firms

#### *Analysts’ research and forecast accuracy in diversified parent firms*

Table 2 presents the results of the Heckman model for the divesting parent companies. In this table, Regression 1 presents the results of the first-stage regression taking Parent EPS forecast inclusion as its dependent variable, and Regression 2 presents the results of the second-stage regression taking Parent EPS forecast error as the dependent variable. Subsidiary IPO/parent IPO is the instrument included in the first-stage regression. Both the first- and second-stage regressions include the independent and control variables, as well as year fixed effects.

In Regression 2, the research that analysts produce about the diversified parent companies is associated with improved forecast accuracy. The coefficients on # annual EPS forecasts and EPS growth forecast are both negative and significant, supporting H1a. These estimates indicate that each additional EPS forecast an analyst produces is associated with forecast errors that are lower by

<sup>11</sup> To ensure that our results are not being driven by this choice of methodology, we also estimated our models using ordinary least squares regressions, yielding consistent results.

Table 2. Heckman selection model, parent companies

| Regression dependent variable:    | (1)<br>First-stage EPS forecast inclusion | (2)<br>Second-stage EPS forecast error |
|-----------------------------------|---|--|
| Subsidiary IPO/parent IPO         | -0.030**<br>(0.015)                       |  |
| # annual EPS forecasts            | 1.858***<br>(0.094)                       | -0.051***<br>(0.011)                   |
| EPS growth forecast               | 0.005<br>(0.129)                          | -0.025***<br>(0.008)                   |
| Financial statement index         | -0.096<br>(0.088)                         | 0.022***<br>(0.006)                    |
| Analysis of spin-off rationale    | 0.187<br>(0.146)                          | -0.044***<br>(0.010)                   |
| Analysis of conglomerate discount | -0.208<br>(0.197)                         | -0.033***<br>(0.013)                   |
| Herfindahl Index                  | 0.075<br>(0.299)                          | -0.063***<br>(0.022)                   |
| Relative size                     | -0.731***<br>(0.268)                      | 0.270***<br>(0.029)                    |
| Multiple divestiture              | 0.607***<br>(0.240)                       | 0.132***<br>(0.018)                    |
| Days announce to report date      | 0.000<br>(0.001)                          | 0.000<br>(0.000)                       |
| Days report to effective date     | 0.001*<br>(0.001)                         | 0.000<br>(0.000)                       |
| Analyst ranking by II             | 0.034<br>(0.042)                          | 0.009***<br>(0.003)                    |
| Analyst advisor                   | -0.020<br>(0.082)                         | -0.019***<br>(0.006)                   |
| Recommendation                    | 0.120<br>(0.125)                          | -0.031***<br>(0.009)                   |
| ln(Total assets)                  | -0.000<br>(0.000)                         | 0.000***<br>(0.000)                    |
| Debt/assets                       | 0.254<br>(0.636)                          | 0.184***<br>(0.048)                    |
| Lambda                            |   | -0.059***<br>(0.029)                   |
| Constant                          | -1.739***<br>(0.678)                      | -0.058<br>(0.044)                      |
| Year fixed effects                | Yes                                       | Yes                                    |
| Observations                      | 1,793                                     | 1,793                                  |

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

5.1 percentage points. When an analyst forecasts a diversified firm's EPS growth, his/her forecast errors are lower by 2.5 percentage points. By contrast, the coefficient on Financial statement index is positive and significant.

When analysts do more work to understand why diversified firms undertake spin-offs, their earnings forecasts are more accurate. The coefficients on Analysis of spin-off rationale and Analysis of conglomerate discount are both negative and significant, providing support for Hypotheses 2a and

2b. These coefficient estimates indicate that when an analyst studies a diversified firm's rationale for undertaking a spin-off or the magnitude of its diversification discount, his/her forecast errors are 4.4 and 3.3 percentage points lower, respectively.

The variables representing the characteristics of diversified firms behave largely as expected. The coefficient on the Herfindahl Index is negative and significant, indicating that forecast accuracy is worse for more highly diversified firms. The positive and significant coefficient on Relative size suggests that analysts produce less accurate forecasts about firms that undertake larger spin-offs. The coefficient on Multiple divestiture is also positive and significant, revealing that analysts produce less accurate forecasts about diversified firms that undertake multiple spin-offs simultaneously.

Among the control variables, the amount of time elapsed between the announcement, report, and effective dates of spin-offs is not related to forecast accuracy (Days announce to report date and Days report to effective date). The positive and significant coefficient on Analyst ranking by II indicates that analysts who are ranked by Institutional investor produce less accurate earnings forecasts than unranked analysts. This result may be driven by the fact that these analysts' expertise and talent, as defined by Institutional Investor's industry-based classification system, does not match well with the reality of the highly complex, diversified firms they are covering. The negative and significant coefficient on Analyst advisor suggests that analysts produce more accurate forecasts about companies with which the investment banks they work for had prior advisory relationships. Consistent with a career concerns-type explanation, the negative and significant coefficient on Recommendation suggests that forecast accuracy improves when analysts express an opinion about a stock. Finally, the positive and significant coefficients on ln(Total assets) and Debt/assets reveal that analysts produce less accurate research about large and highly levered firms.

In Regression 1, the negative and significant coefficient on the instrumental variable, Subsidiary IPO/parent IPO, indicates that analysts are more likely to include EPS forecasts about parent companies that operate in more active industries, represented by smaller values of the instrument. Additionally, the significant coefficient on lambda in Regression 2 indicates that the effects of selection bias in the reports that do (and do not)

Table 3. Analysts' research about highly diversified parent firms

| DV: Parent EPS forecast error                           | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Diversified firm  | 0.054***<br>(0.011)  | 0.131***<br>(0.029)  | 0.068***<br>(0.014)  | 0.044***<br>(0.012)  | 0.070***<br>(0.013)  | 0.067***<br>(0.012)  |
| # Annual EPS forecasts                                  | -0.020**<br>(0.010)  | -0.009<br>(0.010)    | -0.020**<br>(0.010)  | -0.019**<br>(0.010)  | -0.020**<br>(0.010)  | -0.019**<br>(0.010)  |
| Diversified firm × # annual<br>EPS forecasts            |                      | -0.040***<br>(0.014) |                      |                      |                      |                      |
| EPS growth forecast                                     | -0.025***<br>(0.008) | -0.026***<br>(0.008) | -0.013<br>(0.011)    | -0.024***<br>(0.008) | -0.024***<br>(0.008) | -0.025***<br>(0.008) |
| Diversified firm × EPS growth<br>forecast               |                      |                      | -0.026<br>(0.016)    |                      |                      |                      |
| Financial statement index                               | 0.020***<br>(0.005)  | 0.021***<br>(0.005)  | 0.019***<br>(0.005)  | 0.008<br>(0.008)     | 0.019***<br>(0.005)  | 0.019***<br>(0.005)  |
| Diversified firm × Financial<br>statement index         |                      |                      |                      | 0.025**<br>(0.011)   |                      |                      |
| Analysis of spin-off rationale                          | -0.035***<br>(0.010) | -0.037***<br>(0.010) | -0.034***<br>(0.010) | -0.032***<br>(0.010) | -0.015<br>(0.013)    | -0.036***<br>(0.010) |
| Diversified firm × Analysis of<br>spin-off rationale    |                      |                      |                      |                      | -0.046**<br>(0.018)  |                      |
| Analysis of conglomerate<br>discount                    | -0.041***<br>(0.013) | -0.038***<br>(0.013) | -0.041***<br>(0.013) | -0.041***<br>(0.013) | -0.037***<br>(0.013) | -0.004<br>(0.019)    |
| Diversified firm × Analysis of<br>conglomerate discount |                      |                      |                      |                      |                      | -0.061**<br>(0.024)  |

Regressions include all the control variables from Table 2 as well as year fixed effects.

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

include EPS forecasts for the parent companies are substantial, thereby justifying our empirical approach.

#### *Analysts' research and forecast accuracy in diversified parent firms in which information asymmetry is high*

The findings described thus far suggest that the research that analysts produce about diversified firms can help investors gain insight into the functioning of these companies. Building on these results, Hypotheses 3a-c predict that the value of analysts' research will be greater when information asymmetry is higher between diversified companies and their investors. Tables 3, 4, and 5 present the key coefficients from regressions testing Hypotheses 3a-c.

The coefficients in these three tables come from the second-stage regressions of Heckman selection models taking Parent EPS forecast error as their dependent variable. The key independent variables are the interaction terms between the variables representing analysts' research (# annual EPS forecasts, EPS growth forecast, Financial statement index, Analysis of spin-off rationale, and Analysis

of conglomerate discount) and the variables representing firms in which less exogenous information is available (Diversified firm, Large spin-off, and Multiple divestiture).

In Table 3, the coefficients on Diversified firm × # annual EPS forecasts, Diversified firm × Analysis of spin-off rationale, and Diversified firm × Analysis of conglomerate discount are all negative and significant. The coefficients on the main effects of # annual EPS forecasts, Analysis of spin-off rationale, and Analysis of conglomerate discount lose their significance in these regressions. This suggests that the benefits of these types of analysts' research are greater in more diversified firms.

In Table 4, the coefficients on Large spin-off × # annual EPS forecasts, Large spin-off × Financial statement index, Large spin-off × Analysis of spin-off rationale, and Large spin-off × Analysis of conglomerate discount are all negative and significant. The coefficients on the main effects (# annual EPS forecasts, Financial statement index, Analysis of spin-off rationale, and Analysis of conglomerate discount) do not lose their significance in these regressions. This suggests that while analysts' research is beneficial

Table 4. Analysts' research about parent firms that undertake large spin-offs

| DV: Parent EPS forecast error                      | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Large spin-off                                     | 0.161***<br>(0.014)  | 0.275***<br>(0.036)  | 0.167***<br>(0.017)  | 0.174***<br>(0.016)  | 0.182***<br>(0.016)  | 0.180***<br>(0.015)  |
| # Annual EPS forecasts                             | -0.043***<br>(0.010) | -0.028***<br>(0.011) | -0.043***<br>(0.010) | -0.042***<br>(0.010) | -0.043***<br>(0.010) | -0.044***<br>(0.010) |
| Large spin-off × # annual EPS forecasts            |                      | -0.055***<br>(0.016) |                      |                      |                      |                      |
| EPS growth forecast                                | -0.023***<br>(0.008) | -0.022***<br>(0.008) | -0.021**<br>(0.008)  | -0.023***<br>(0.008) | -0.022***<br>(0.008) | -0.022***<br>(0.008) |
| Large spin-off × EPS growth forecast               |                      |                      | -0.012<br>(0.022)    |                      |                      |                      |
| Financial statement index                          | 0.019***<br>(0.005)  | 0.020***<br>(0.005)  | 0.019***<br>(0.005)  | 0.024***<br>(0.006)  | 0.019***<br>(0.005)  | 0.019***<br>(0.005)  |
| Large spin-off × Financial statement index         |                      |                      |                      | -0.021*<br>(0.013)   |                      |                      |
| Analysis of spin-off rationale                     | -0.036***<br>(0.010) | -0.035***<br>(0.010) | -0.036***<br>(0.010) | -0.036***<br>(0.010) | -0.026**<br>(0.011)  | -0.037***<br>(0.010) |
| Large spin-off × Analysis of spin-off rationale    |                      |                      |                      |                      | -0.055**<br>(0.025)  |                      |
| Analysis of conglomerate discount                  | -0.041***<br>(0.013) | -0.043***<br>(0.013) | -0.041***<br>(0.013) | -0.040***<br>(0.013) | -0.042***<br>(0.013) | -0.025*<br>(0.014)   |
| Large spin-off × Analysis of conglomerate discount |                      |                      |                      |                      |                      | -0.075***<br>(0.028) |

Regressions include all the control variables from Table 2 as well as year fixed effects.

\*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.10

in general, it is even more valuable in firms that undertake large spin-offs.

Table 5 reveals that only the production of *pro forma* financial statements improves the accuracy of analysts' forecasts about firms that undertake multiple divestitures (Multiple divestiture × Financial statement index). None of the coefficients on the other interaction terms is statistically significant. This result may be driven by the fact that only 10 of the firms in our sample undertook multiple divestitures at the same time.

The results in this subsection reveal that when information asymmetry is higher in diversified firms, the research that analysts produce helps investors overcome this imbalance. The next subsection investigates how analysts cover spun-off subsidiaries, shedding light on how their research helps investors understand the component parts of diversified firms.

### Spun-off subsidiaries

#### *Analysts' research and forecast accuracy in spun-off subsidiaries*

Table 6 presents the results of the Heckman model for the spun-off subsidiaries. Regression 1 presents

the first-stage regression taking Subsidiary EPS forecast inclusion as its dependent variable, and Regression 2 presents the second-stage regression taking Subsidiary EPS forecast error as the dependent variable. Subsidiary IPO/parent IPO is the instrument in the first-stage regression, and both the first- and second-stage regressions include the independent and control variables described previously, as well as year fixed effects.

Regression 2 in Table 6 reveals that the research analysts produce about spun-off subsidiaries is not strongly associated with improved forecast accuracy: only the coefficient on Analysis of segments is negative and significant, supporting Hypothesis 2c. This coefficient estimate indicates that forecast errors for spun-off subsidiaries are lower by 3.1 percentage points when analysts produce research about the segments operating within parent companies. The coefficient estimates on # annual EPS forecasts, EPS growth forecast, and Financial statement index are all *positive* and significant; instead of improving forecast accuracy, analysts' production of *pro forma* forecasts about spun-off subsidiaries is associated with higher forecast errors. Thus, H1b is not supported.

The variables representing the characteristics of the spun-off subsidiaries all behave as expected.

Table 5. Analysts' research about parent firms that undertake multiple divestitures

| DV: Parent EPS forecast error                               | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Multiple divestiture  | 0.132***<br>(0.018)  | 0.075*<br>(0.045)    | 0.146***<br>(0.023)  | 0.148***<br>(0.020)  | 0.135***<br>(0.019)  | 0.126***<br>(0.020)  |
| # annual EPS forecasts                                      | -0.051***<br>(0.011) | -0.055***<br>(0.011) | -0.050***<br>(0.011) | -0.049***<br>(0.011) | -0.051***<br>(0.011) | -0.051***<br>(0.011) |
| Multiple divestiture × # annual<br>EPS forecasts            |                      | 0.032<br>(0.023)     |                      |                      |                      |                      |
| EPS growth forecast   | -0.025***<br>(0.008) | -0.026***<br>(0.008) | -0.022**<br>(0.009)  | -0.025***<br>(0.008) | -0.025***<br>(0.008) | -0.025***<br>(0.008) |
| Multiple divestiture × EPS<br>growth forecast               |                      |                      | -0.030<br>(0.028)    |                      |                      |                      |
| Financial statement index                                   | 0.022***<br>(0.006)  | 0.022***<br>(0.006)  | 0.022***<br>(0.006)  | 0.024***<br>(0.006)  | 0.022***<br>(0.006)  | 0.022***<br>(0.006)  |
| Multiple divestiture ×<br>Financial statement index         |                      |                      |                      | -0.051**<br>(0.025)  |                      |                      |
| Analysis of spin-off rationale                              | -0.044***<br>(0.010) | -0.045***<br>(0.010) | -0.045***<br>(0.010) | -0.043***<br>(0.010) | -0.043***<br>(0.011) | -0.044***<br>(0.010) |
| Multiple divestiture × Analysis<br>of spin-off rationale    |                      |                      |                      |                      | -0.055<br>(0.025)    |                      |
| Analysis of conglomerate<br>discount                        | -0.033**<br>(0.013)  | -0.033**<br>(0.013)  | -0.033**<br>(0.013)  | -0.031**<br>(0.013)  | -0.033**<br>(0.013)  | -0.037**<br>(0.014)  |
| Multiple divestiture × Analysis<br>of conglomerate discount |                      |                      |                      |                      |                      | 0.020<br>(0.035)     |

Regressions include all the control variables from Table 2 as well as year fixed effects.

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

The coefficient on No tracking stock is positive and highly significant, suggesting that when a spun-off subsidiary has no prior stock price history, analysts produce less accurate forecasts about it. The negative and significant coefficient on Relative size reveals that forecast errors are higher for smaller spun-off subsidiaries, as these are precisely the business units about which analysts are likely to have less information. Finally, the positive and significant coefficient on Unrelated indicates that analysts produce less accurate forecasts about spun-off subsidiaries that are unrelated to their parent companies' main operations, since these units are likely to be further from analysts' primary areas of specialization.

Among the controls, the negative and significant coefficient on Days announce to report date means that the further in time a report is written after a spin-off announcement, the more accurate an analyst's forecasts will be, since more information about the transaction has been revealed. The negative and significant coefficient on Analyst advisor indicates that analysts produced more accurate research about spun-off subsidiaries when their investment banks had prior advisory relationships with their parent companies. The coefficient on Analyst ranking by II is not significant, meaning

that more highly reputed analysts do not produce more accurate forecasts about spun-off subsidiaries than their lower-ranked or unranked peers. This null result may be driven by the fact that the industry expertise Institutional Investor assigns to analysts might not correspond to the industry of the spun-off subsidiary. Finally, the positive and significant coefficients on ln(Total assets) and Debt/assets reveal that analysts produce less accurate research about larger and more levered firms.

In Regression 1, the positive and significant coefficient on the instrument suggests that analysts will be more likely to make EPS forecasts about subsidiaries operating in more active industries, as reflected by higher values of Subsidiary IPO/parent IPO. Additionally, the significant coefficient on lambda indicates that the effects of nonrandom selection in the reports that include EPS forecasts for the spun-off subsidiaries are substantial.

#### **Analysts' research and forecast accuracy in spun-off subsidiaries in which information asymmetry is high**

Hypotheses 4a-c predict that analysts' research will contribute more to the accuracy of the forecasts they make about spun-off subsidiaries

Table 6. Heckman selection model, spun-off subsidiaries

| Regression<br>Dependent<br>variable: | (1)<br>First-stage<br>EPS forecast<br>inclusion | (2)<br>Second-stage<br>EPS forecast<br>error |
|--------------------------------------|---|--|
| Subsidiary IPO/parent IPO            | 0.036**<br>(0.015)                              |  |
| # annual EPS forecasts               | 1.421***<br>(0.075)                             | 0.036**<br>(0.016)                           |
| EPS growth forecast                  | 0.122<br>(0.258)                                | 0.045**<br>(0.020)                           |
| Financial statement index            | -0.019<br>(0.104)                               | 0.020**<br>(0.009)                           |
| Analysis of segments                 | 0.422***<br>(0.131)                             | -0.031**<br>(0.015)                          |
| No tracking stock                    | 0.737<br>(0.611)                                | 0.317***<br>(0.060)                          |
| Relative size                        | -0.167<br>(0.237)                               | -0.071**<br>(0.028)                          |
| Unrelated                            | -0.160<br>(0.290)                               | 0.134***<br>(0.034)                          |
| Days announce to report date         | -0.001<br>(0.001)                               | -0.000*<br>(0.000)                           |
| Days report to effective date        | -0.002**<br>(0.001)                             | -0.000<br>(0.000)                            |
| Analyst ranking by II                | -0.055<br>(0.042)                               | -0.000<br>(0.005)                            |
| Analyst advisor                      | -0.102<br>(0.015)                               | -0.027***<br>(0.011)                         |
| Recommendation                       | -0.042<br>(0.120)                               | -0.016<br>(0.014)                            |
| ln(Total assets)                     | 0.000<br>(0.000)                                | 0.000***<br>(0.000)                          |
| Debt/assets                          | 0.803<br>(0.430)                                | 0.098**<br>(0.049)                           |
| Lambda                               |   | 0.075**<br>(0.030)                           |
| Constant                             | -2.070***<br>(0.794)                            | -0.461***<br>(0.099)                         |
| Year fixed effects                   | Yes   | Yes  |
| Observations                         | 1,793   | 1,793  |

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

when less exogenous information is available. Tables 7, 8, and 9 present the key coefficients from regressions testing these hypotheses.

The results in these tables come from the second-stage regressions of Heckman selection models taking Subsidiary EPS forecast error as their dependent variable. The key independent variables are the interaction terms between the variables representing analysts' research (# Annual EPS forecasts, EPS growth forecast, Financial statement index, and Analysis of segments) and the variables representing spun-off subsidiaries in which less exogenous information is available (No tracking stock, Small spin-off, and Unrelated).

In Table 7, the coefficients on No tracking stock × # Annual EPS forecasts, No tracking stock × EPS growth forecast, and No tracking stock × Financial statement index are all negative and significant, as are the coefficients on Unrelated × # annual EPS forecasts, Unrelated × EPS growth forecast, and Unrelated × Financial statement index in Table 9. By contrast, the coefficients on the main effects (# annual EPS forecasts, EPS growth forecast, and Financial statement index) in these tables are positive and significant. Thus, analysts' *pro forma* forecasts are more valuable in spun-off subsidiaries that did not previously have a tracking stock and that are unrelated to their parent companies.

In Table 8, the coefficient on Small spin-off × Financial statement index is the only interaction term that is negative and significant, though the coefficients on Small spin-off × # annual EPS forecasts and Small spin-off × EPS growth forecast are also negative. These results provide suggestive evidence that the value of analysts' *pro forma* forecasts is higher among smaller spun-off subsidiaries.

In all three tables, the coefficients on No tracking stock × Analysis of segments, Small spin-off × Analysis of segments, and Unrelated × Analysis of segments are all positive and significant, while the coefficients on Analysis of segments are negative and significant. This suggests that the value of analysts' research about the segments within diversified firms is lower when less exogenous information is available about spun-off subsidiaries. Because analysts' efforts along this dimension were already productive, this result is not surprising.

In sum, the evidence in support of the value of analysts' research about spun-off subsidiaries is mixed. On average, the only kind of research that appears to be associated with improved forecast accuracy for these business units is when analysts study the pre-spin-off segments within diversified firms. However, more general types of analysts' research—*pro-forma* forecasts—are more valuable in situations in which information asymmetry is higher, suggesting that analysts' research can help investors overcome this imbalance.

## DISCUSSION AND CONCLUSION

This study has investigated the value of analysts' research in helping investors understand

Table 7. Analysts' research about spun-off subsidiaries with no prior tracking stock

| DV: Subsidiary EPS forecast error             | (1)                 | (2)                  | (3)                  | (4)                 | (5)                 |
|---|---------------------|----------------------|----------------------|---------------------|---------------------|
| No tracking stock                             | 0.317***<br>(0.060) | 0.453***<br>(0.069)  | 0.413***<br>(0.058)  | 0.340***<br>(0.060) | 0.090<br>(0.120)    |
| # annual EPS forecasts                        | 0.036**<br>(0.016)  | 0.064***<br>(0.017)  | 0.028*<br>(0.015)    | 0.037**<br>(0.016)  | 0.035**<br>(0.016)  |
| No tracking stock × # annual EPS forecasts    |                     | -0.071***<br>(0.021) |                      |                     |                     |
| EPS growth forecast                           | 0.045**<br>(0.020)  | 0.044**<br>(0.019)   | 0.303***<br>(0.047)  | 0.040**<br>(0.020)  | 0.038*<br>(0.020)   |
| No tracking stock × EPS growth forecast       |                     |                      | -0.303***<br>(0.050) |                     |                     |
| Financial statement index                     | 0.020**<br>(0.009)  | 0.024***<br>(0.008)  | 0.015*<br>(0.008)    | 0.066***<br>(0.021) | 0.022**<br>(0.009)  |
| No tracking stock × Financial statement index |                     |                      |                      | -0.054**<br>(0.023) |                     |
| Analysis of segments                          | -0.031**<br>(0.015) | -0.038**<br>(0.015)  | -0.024*<br>(0.014)   | -0.027*<br>(0.015)  | -0.258**<br>(0.105) |
| No tracking stock × Analysis of segments      |                     |                      |                      |                     | 0.230**<br>(0.106)  |

Regressions include all the control variables from Table 6 as well as year fixed effects.  
 \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

Table 8. Analysts' research about small spun-off subsidiaries

| DV: Subsidiary EPS forecast error          | (1)                 | (2)                  | (3)                  | (4)                 | (5)                  |
|--|---------------------|----------------------|----------------------|---------------------|----------------------|
| Small spin-off                             | -0.036<br>(0.022)   | 0.014<br>(0.044)     | -0.026<br>(0.023)    | -0.031<br>(0.024)   | -0.060**<br>(0.026)  |
| # annual EPS forecasts                     | 0.037**<br>(0.017)  | 0.040**<br>(0.017)   | 0.039**<br>(0.017)   | 0.038**<br>(0.017)  | 0.037**<br>(0.016)   |
| Small spin-off × # annual EPS forecasts    |                     | -0.031<br>(0.024)    |                      |                     |                      |
| EPS growth forecast                        | 0.043**<br>(0.020)  | 0.046**<br>(0.020)   | 0.059***<br>(0.022)  | 0.043**<br>(0.020)  | 0.041**<br>(0.020)   |
| Small spin-off × EPS growth forecast       |                     |                      | -0.082*<br>(0.047)   |                     |                      |
| Financial statement index                  | 0.021**<br>(0.009)  | 0.021**<br>(0.009)   | 0.021**<br>(0.009)   | 0.023**<br>(0.010)  | 0.021**<br>(0.009)   |
| Small spin-off × Financial statement index |                     |                      |                      | -0.012<br>(0.021)   |                      |
| Analysis of segments                       | -0.040**<br>(0.016) | -0.043***<br>(0.016) | -0.042***<br>(0.016) | -0.041**<br>(0.016) | -0.051***<br>(0.017) |
| Small spin-off × Analysis of segments      |                     |                      |                      |                     | 0.063*<br>(0.037)    |

Regressions include all the control variables from Table 6 as well as year fixed effects.  
 \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

diversified firms. Securities analysts should play a key role in mitigating the problem of asymmetric information between companies and investors. However, analysts are as challenged by the opacity of diversified firms as investors are, due to their industry specializations and the costliness of gathering information about such companies.

This article examines how analysts go about understanding diversified firms. Using detailed information collected from analyst reports about firms that announce corporate spin-offs, we consider how the research that analysts produce impacts the accuracy of their earnings forecasts for spun-off subsidiaries and the remaining operations

Table 9. Analysts' research about unrelated spun-off subsidiaries

| DV: Subsidiary EPS forecast error          | (1)                 | (2)                  | (3)                  | (4)                 | (5)                  |
|--|---------------------|----------------------|----------------------|---------------------|----------------------|
| Small spin-off                             | -0.036<br>(0.022)   | 0.014<br>(0.044)     | -0.026<br>(0.023)    | -0.031<br>(0.024)   | -0.060**<br>(0.026)  |
| # annual EPS forecasts                     | 0.037**<br>(0.017)  | 0.040**<br>(0.017)   | 0.039**<br>(0.017)   | 0.038**<br>(0.017)  | 0.037**<br>(0.016)   |
| Small spin-off × # annual EPS forecasts    |                     | -0.031<br>(0.024)    |                      |                     |                      |
| EPS growth forecast                        | 0.043**<br>(0.020)  | 0.046**<br>(0.020)   | 0.059***<br>(0.022)  | 0.043**<br>(0.020)  | 0.041**<br>(0.020)   |
| Small spin-off × EPS growth forecast       |                     |                      | -0.082*<br>(0.047)   |                     |                      |
| Financial statement index                  | 0.021**<br>(0.009)  | 0.021**<br>(0.009)   | 0.021**<br>(0.009)   | 0.023**<br>(0.010)  | 0.021**<br>(0.009)   |
| Small spin-off × Financial statement index |                     |                      |                      | -0.012<br>(0.021)   |                      |
| Analysis of segments                       | -0.040**<br>(0.016) | -0.043***<br>(0.016) | -0.042***<br>(0.016) | -0.041**<br>(0.016) | -0.051***<br>(0.017) |
| Small spin-off × Analysis of segments      |                     |                      |                      |                     | 0.063*<br>(0.037)    |

Regressions include all the control variables from Table 6 as well as year fixed effects.

\*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.10

of the divesting parent firms. Studying analyst reports written about these entities is a unique way to gain insights into the component parts of diversified firms and their combined value.

The results in this article reveal that while analysts' research is associated with more accurate earnings forecasts for diversified firms, the only type of research that helps them produce more accurate forecasts about spun-off subsidiaries is when they explicitly study the pre-spin-off segments within diversified companies. Moreover, analysts' research is particularly valuable when the characteristics of both the diversified firms and their spun-off subsidiaries make them more difficult to cover, suggesting that analysts are able to surmount the challenge of understanding entities about which little information is available.

This study has important implications for corporate strategy research on the value of diversification. First, this study sheds light on why investors may not understand diversified firms well and, hence, why these firms may be undervalued in the market. In steady state, analysts may not perform detailed research about the expected future performance of the individual components of diversified firms. Only when a spin-off has been announced do analysts produce the kinds of research that are helpful in understanding these companies.

Further to this point, the contrast between the consistent value that analysts' research adds in

evaluating diversified firms and the more mixed value of their research about spun-off subsidiaries suggests that one reason why investors might have difficulty understanding diversified firms is that analysts themselves do not understand the subsidiaries of these companies well. This article finds that two factors mitigate this problem. First, when analysts specifically study the individual business segments within diversified firms, the value of their research improves. Second, when analysts are forced by a relative lack of exogenous information about these spun-off subsidiaries to devote more effort to understanding these units, the value of their research also improves. These findings elucidate how analysts overcome the information asymmetry they experience vis-à-vis diversified firms.

Additionally, our findings also shed light on the process by which managers whose companies are experiencing high information asymmetry vis-à-vis their outside investors reveal information to these parties through major corporate events. This article shows that only when a diversified firm announces that it will spin off a business unit do analysts begin to evaluate the antecedent conditions that might drive it to undertake that spin-off, such as a high conglomerate discount. By considering how the detailed components of analysts' research influence forecast accuracy, we are able to examine how these intermediaries

overcome valuation challenges in entities about which little information is available.

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