CAN FIRM GOVERNANCE EXPLAIN THE DIFFERENCES THAT EXIST

BETWEEN SALES AND EPS FORECAST ERRORS?

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Abstract

This study explores the differences that exist between sales and EPS forecast errors in a corporate governance's perspective. We hypothesize that analysts have a harder time to forecast sales than EPS because firms have a greater ability to control EPS than sales figures. We also hypothesize the difference in absolute forecast error of sales and EPS is larger in weak governance firms, as these firms may tend more often to manipulate their earnings. We employ four variables as proxies of corporate governance: the number of analysts, market capitalization, institutional ownership percentage and years since IPO. We find that the better the corporate governance, the more accurate are analysts' sales and EPS forecasts. Consistent with the idea that sales are much harder to manipulate, we find that firm with better governance has a smaller difference between the two measures of error. Overall, these results are new and may have important implications for better understanding the governance environment of firms.

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Table of Content

1. Introduction

Before the earnings announcement call on May 17th, 2017, IBM was expected to report earnings of $2.35 per share and a revenue of $18.394 billion in the second quarter according to analysts polled by Reuters. On May 17th, 2017, IBM posted quarterly revenue of $18.155 billion and quarterly earnings of $2.38 per share with -1.30% surprise in revenue estimation and 1.28% surprise in earnings estimation. TherapeuticsMD (Ticker: TXMD), another company on the Nasdaq global select market, posted actual sales of $3.98 million comparing to estimated sales of $5.23 million, providing a negative surprise of -23.81% even though the earnings numbers were only -1.52%.

These two examples are proper illustrations of the topic discussed and explored in this research and study: The differences between sales and EPS forecast of a company sometimes seems too odd, and lead one to question whether these may be related to corporate governance. Why do some companies have huge difference of surprise between EPS and Sales, and can it be that this difference relates to the company's corporate governance? The novelty of our idea is that it seems that it should be much harder to manipulate sales figures than it is to manipulate earnings figures. In general, if the firms miss sales by 1% compared to the Sales consensus, one would think that it should also miss EPS by 1% compared to the EPS consensus. After all, analysts use the same model to predict both. However, the fact that EPS surprise is much smaller suggests that firms may be manipulating earnings using all kinds of accounting tricks,

to soften the blow to investors. Our main hypothesis is, therefore that firms with better governance are probably less prone to do manipulation tricks, rather they will try to update the market continuously on their performance in order not to engage in any deception.

These research questions are initiated by information content in the literature review. Livnat's (2004) study extended the earnings study to further research on the importance of sales and expenses. Burgstahler (2006) suggested the possibilities behind the management of earnings. Kama's (2009) study suggested revenues and earnings as key value drivers in various contexts. Kama (2009) found that "current earnings are a weak indicator of future earnings and the role of earnings is relatively less important." Cormier (2014) found a connection between corporate governance and earnings forecast in IPO prospectus and Bonetti (2016) found that firm-level governance had an impact on financial reporting quality as well.

Based on previous studies and especially Kama's (2009) study, our study further focuses on the linear relationship between surprise of sales (EPS) and corporate governance factors as mentioned: number of analysts, market capitalization, percentage of institutional ownership and different years since IPO. Our first goal is to find out whether these factors are related to company's surprise of sales and EPS and how much significance they have. Our second goal is to learn from the differences between absolute surprise of sales and EPS to see if firm governance can explain the forecast errors.

In investigating the relationship between these factors and sales and EPS surprise, we follow the methodology of using linear regression. The sample includes 11,062 observations for 1,564 companies from 2000 to 2016. In the sample, all companies are sorted and ranked into five groups for each variable including their average number of analyst, market value, percentage of institutional ownership and years since IPO. Sales surprise is calculated as the difference between actual sales and the estimated sales over the actual sales. EPS surprise is calculated as the difference between actual and estimated value divided by the share price. In the regression analysis, a joint and separate examination of their relevance with sales and EPS surprise is performed. The result shows that sales forecast is much less accurate than earnings forecasts, which is consistent with the idea that sales are harder to predict than EPS. We also find that smaller firms, firms with a lower number of analysts, firms with lower institutional ownership, and young firms have less accurate forecast (both sales and EPS forecasts), which is consistent with these firms being associated with more uncertainty, but also with them being lower transparency and governance.

We also analyze the difference of sales and EPS surprise to see if the variation of these difference shows a sign of relevance to corporate governance. A t-test of difference on the difference (sales and EPS forecast errors) within all category groups is tested. We find that firms with less number of analysts, less market capitalization, less institutional ownership percentage or relatively new to the public market are associated with larger difference between sales and EPS forecast accuracy, which is consistent with these firms' higher tendency to manipulate EPS.

Overall, this study has important implications for analysts' report readers and investors. It highlights the factors that have a significant impact on the accuracy of sales and EPS surprise. It further suggests that small firms with weaker governance are more likely to have earnings management such that there is a bigger difference of surprise meaningless accuracy on estimation.

The study proceeds as follows: In Section 2, we will review the literature and express our motivation. In Section 3, we have our hypotheses and testing results. In Section 4, we have our conclusions and plans for future research.

2. Literature Review

There are numerous researches and studies on earnings since Ball and Brown (1968) first concluded that "we do not find it disconcerting that the market has turned to other sources which can be acted upon more promptly than annual net income." Researchers started extending Ball and Brown (1968)'s conclusion. Fried and Givoly (1982) indicated that "The use of analyst forecasts should increase the extent to which a given earnings-type disclosure is correctly classified as good news or bad news. Our study extends the idea on analyst forecast and tries to measure the accuracy of forecasts and find related factors that can explain the forecast errors. Waymire (1984) found that "management forecasts are associated with the information about the firm's earnings prospects as reflected in the deviation between management forecast and expected earnings." The relationship between analyst forecasts and management forecasts are

important indicators for firm's future earnings and abnormal stock returns associated with the company. Livnat (2004) found that "the post-earnings-announcement-drift is stronger when the revenue surprise is in the same direction as the earnings surprise." Kama (2009) extended Livnat (2004)'s study on further investigating the information content of earnings and revenues such as the magnitude of earnings management and a sign of earnings, etc. Burgstahler (2006) provided empirical evidence of both upward managements of reported earnings and downward management of analysts' forecast to achieve zero and small positive earnings surprises. Jiang (2008) found that "firms with weak corporate governance are more likely to manage earnings in order to meet or beat analyst forecasts." Cormier (2014) found that firms with better corporate governance are less likely to include voluntary earnings forecast in their IPO prospectus.

In this study, we are inspired by the discussion of earnings announcement and surprise from many kinds of literature. Based on Kama (2009), We extend Kama's expectation on the lower explanatory power of earnings with high earnings management. We intend to focus on which kind of companies are more likely to have earnings management and forecast errors. We also learn from Jiang (2008) and Cormier (2014) that corporate governance may be the one that can explain.

3. Hypothesis and Testing

After the preliminary discoveries on how a company's governance, information disclosure, and transparency could impact the level of deviation (surprise) of the sales and EPS, a couple of hypotheses and tests will be carried out in this paper to see if the actual result and trend are in line with our expectations.

3.1 Hypothesis 1: A company's sales are usually in association with a more notable surprise than its EPS

Generally speaking, a publicly listed company would prefer a stable share price over a volatile one. A big shock in sales or earnings will cause drastic changes in a company's share price. Therefore, companies would try their best not to have their actual sales and earnings deviated too far from analysts' forecast. The efforts made by firms may be related to its operations. For example, cost reduction will help a company increase its profit margin. However, it can also be the accounting maneuvers a firm use to artificially modify its financial results. Modern accounting standard offers business leeways on treatments of some transactions and activities. While the flexible accounting rule provides firms with discretions, some businesses may play gimmicks on their financial statements to present false results. Among all of the accounts, the net profit on the income statement is the one that often gets manipulated because there are different ways to allocate and record costs and expenses. For example, a company can

adopt straight line or acceleration methods to depreciate the value of its fixed assets, but the latter approach can noticeably reduce the net earnings of the business. Because there are so many judgments calls can be made when calculating net profit, it is believable that EPS is easier to be manipulated. Sales, on the other hand, is relatively harder to modify because it is single line number that depends on the company selling its product and services, which is not subject to much manipulation. Therefore, if our logic is right, we should see a smaller surprise in actual EPS than Sales on average (regardless of the surprise direction).

Data and Variables

We downloaded the dataset to test hypothesis 1 from I/B/E/S WRDS database for the time between Nov 1991 and July 2017. The original dataset contains quarterly actual and consensus forecast sales and EPS data for all public listed companies in the United States. Some unmeaningful data has been dropped to reflect the most precise and meaningful results.

To measure how accurate are the sales and EPS forecasts, we need to define several variables. The first one is the absolute difference between the consensus sales forecast and the actual sales (in percentage). In this paper, we will name this variable Absolute Surprise of Sales and label it *ASur_Sales* in our testing.

The calculation of ASur_Sales is

$$ASur\_Sales = \frac{|\,Consensus\ Forecast\ of\ Sales - Actual\ Sales\,|}{Actual\ Sales}$$

where the consensus forecast of sales is the latest forecast but prior to the actual earnings announcement date for that particular period.

Similarly, the second variable we need to use in our testing is the absolute percentage difference between the consensus EPS forecast and the actual EPS. We name this variable Absolute Surprise of EPS and label it ASur_EPS testing purpose.

The calculation of ASur_EPS is

$$ASur\_EPS = \frac{|\,Consensus\ EPS\ forecast - Actual\ EPS\,|}{Share\ Price}$$

Note that we use share price instead of the actual EPS to 'normalize' the EPS surprise and prevent extreme results. The share price is the price at the end of the earning announcement period.

Test Result

After sifting through the data, we have obtained 11,062 observations in total, coming from 1,564 companies. From the summary results in Table 1 (see Appendix),

we see that the mean of ASur_Sales value is 0.07105 among the 11,062 observations, whereas the mean of ASur_EPS is much smaller, only 0.0092. To prevent the outlier effect, we also check the standard deviation and value of both ASur_Sales and ASur_EPS at 1st, 25th, 50th, 75th percentile. The standard deviation is 0.14541 and 0.04634 for ASur_Sales and ASur_EPS, respectively, which means the actual sales are deviated much more from analysts' expectation than EPS, ignoring the direction. The percentile figures also confirmed our thought above for the reason that ASur_Sales are consistently bigger than ASur_EPS on all level. Thus, the result suggests that on average, the sales in a company are associated with a bigger surprise than earnings. Taking the accounting rules and our logic in the hypothesis into consideration, we have valid reasons to suspect that firms are doing more manipulations on their profits than their sales if no other factors can explain such a huge difference.

3.2 Hypothesis 2: The better the corporate governance, the less uncertainty of its sales and earnings, the less surprise of sales and EPS

We employ several variables as proxies of a company's corporate governance quality, even though they may also be correlated with the uncertainty. The first one is the number of analysts that provides sales and EPS forecast for the company. We believe companies with the better information disclosure and operation transparency tend to have better corporate governance, and they will attract more attention from the market and earn more trust from investors. On the one hand, the interest from market

and investors will drive more demand for professional research, including the company's sales and EPS forecast. On the other hand, more analysts will want to analyze a company that provides easier access to its key activities and financial information. Intuitively, the more the number of analysts, the more accurate (less uncertainty) the forecast, the less surprise of sales and EPS (regardless of the surprise direction).

Moreover, we think a company's market capitalization is another proxy to reflect its corporate governance quality. We assume bigger companies tend to have sound administration mechanism as well as better information disclosure and transparency than small firms. Therefore, the forecast made for bigger companies (measured by market capitalization) should be more accurate (less uncertainty), and the surprise of sales and EPS should be less.

Thirdly, we believe higher institutional ownership can help a company improve the corporate governance as well. Compared to individual investors, institutional investors often hold a more significant interest in a company. The influence they have allows them to evaluate and supervise the company's strategies, operations, as well as information disclosure and transparency. If the corporate governance quality is unfavorable, the institutional shareholders can push the management to improve. Hence, we assume that the higher the percentage of institutional ownership, the better corporate governance, the less surprise of sales and EPS.

Lastly, we think the companies' age could affect corporate governance as well. A significant difference between a publicly listed company and a private company is the

information disclosure requirement. Logically, the longer the company has existed in the market, the more familiar it is with the listing rules and disclosure requirement, and better the information transparency. Therefore, by adopting the same logic as the examples above, we assume the older the company, the better the corporate governance, the more accurate the forecast should be, and the less surprise of sales and EPS

Data and Variables

We downloaded the dataset containing the number analysts (*No_Alyst*), market capitalization (*MktCap*), institutional ownership (*Instown*) and companies IPO date for all public listed companies in the United States from WRDS database. Number of analyst, just as the name implies, reflects how many analysts are giving out their forecast on a company's sales and EPS for a specific period (Quarter forecast in our case). Market capitalization is a measure of the size of a publicly listed company. It is calculated by taking the share price and multiply the number of shares in the market. In our research, we use companies' market capitalization on the same date when the sales and EPS forecasts are made. Also, to prevent extreme values in the result, we take the natural log of the original market cap numbers instead of the original ones. Institutional ownership is the total percentage of shares owned by institutional investors as opposed to individual investors. The last variable is called years since IPO (Yrs_IPO). It is the time in years between the sales and EPS forecasts are made and the company's initial public offering date.

Test Result

Because we interpret corporate governance quality by using proxies such as number of analysts, market capitalization, institutional ownership and years since IPO, we decide to perform a multiple linear regression by setting these four variables as the independent variables. *ASur_Sales* and *ASur_EPS* will be the two dependent variables in our test. Table 2 shows us the regression results. According to table 2, we find the ASur_Sales coefficients on the independent variables *No_Alyst*, *MktCap*, *Instown* and *Yrs_IPO* are -0.0010509, -0.0000631, -0.0528096, -0.00255, respectively. The coefficient value depicts a negative relationship between these four factors and the magnitude of the surprises in sales. However, while this negative correlation for *No_Alyst*, *Instown* and *Yrs_IPO* are proven with significant t-score on 99% confidence level, MktCap shows a relatively weak result by merely looking at the small number. The t-score is insignificant, even on the much looser 90% confidence level. The possible explanation for this could be that bigger companies often have more diversified products targeting at different markets. Worldwide conglomerates such as GE have their business realms widely spread from the home appliance to airplane engines. The complication of business undoubtedly will make it harder for analysts to give an accurate forecast, resulting in an insignificant negative relationship between market cap and surprise of sales.

Similarly, the *ASur_EPS* coefficients are -0.0002891, -0.0021219, -0.0069349, 0.0005308 for the four independent variables. The first three coefficient values, which

are significant on the 99% confidence level, proved strong negative correlations between the magnitude of the surprise in EPS and *No_Alyst*, *MktCap,* and *Instown*. The unexpected result happened with the coefficient on *Yrs_IPO*, which is also significant on the 99% confidence level. The positive coefficient suggests a reverse relationship to our expectation — the older the company's age, the bigger the surprise of EPS. In order to discover the reason, we carefully examined our data. We think a possible cause for the irregularity is the data during the subprime crisis. Since the crisis spread to almost every industry, most of the companies around that time reported substantial negative surprise on earnings. Because we only care about the magnitude of the surprise, when converted to absolute surprise in EPS, these negative numbers will show as big positive numbers under absolute value. This thought can also be articulated graphically with Graph 1 (see Appendix), on which we can see a spike for the absolute surprise of EPS around 2007 to 2009. Additionally, the subprime crisis happened in 2008, which is not far away from now, so the *Yrs_IPO* data are not small, either. Therefore, the regression on two big positive numbers is very likely to present such an unreasonable result.

3.3 Hypothesis 3: The better the corporate governance, the less manipulation in EPS.

If our assumption is correct, better corporate governance means sound administrative mechanism and risk management, which will result in more conformity with accounting rules. In this test, we want to discover whether more analysts, higher

market capitalization and institutional ownership and older the company age will reduce the earnings manipulation in a company.

As suggested by hypothesis 1, we already showed that on average, absolute forecast errors in sales are bigger than those for earnings, which is consistent with the idea that it is harder to manipulate earnings. We assume if no company manipulates its earnings, the difference between the absolute surprise in sales and absolute surprise in EPS should remain more or less constant. However, if this difference is larger for firms associated with weaker governance (based on our four proxies), that would be consistent with the idea that the difference between the two forecast errors proxies for earnings manipulation. Hence, a testing regarding the consistency of the surprise difference can be carried out to discover the true relationship between corporate governance and accounting manipulations.

Data and Variables

By using the same dataset compiled in hypothesis 2, we are able to create new variables to conduct testings. Firstly, we defined a new variable—the difference between the absolute surprise in sales and absolute surprise in EPS. We label this variable *Diff_ASur*.

The mathematical calculation of *Diff_ASur* is:

$$Diff\_ASur = ASur\_Sales - ASur\_EPS$$

To generate a meaningful result, the absolute surprise of sales (*ASur_Sales*) and absolute surprise of EPS (*ASur_EPS*) must be for the same firm and reporting period end. Then we divide the difference into five groups based on the number of analysts (*No_Alyst*)[1]. The 1st quintile means the fewest analysts and the 5th quintile is the most analysts. Similarly, we can also divide the difference into five groups based on size (*MktCap*), institutional ownership (*Instown*) and age (*Yrs_IPO*).

Test Result

We conducted three different tests for hypothesis 3. Firstly, we calculated the mean of *Diff_ASur* across all subgroups. In Table 3 (see Appendix), we can find that the mean of *Diff_ASur* in the analyst group are 0.0931304, 0.067077, 0.0590501, 0.0434687, 0.0396256 for group 1 to 5, respectively. The mean of Diff_ASur is decreasing as the number of analyst increase. In size group, the mean of Diff_ASur are 0.0888228, 0.0740259, 0.0578411, 0.0479915, 0.0403867. Again it shows a decreasing order when the company's size goes up. We can find similar stories for institution groups and age

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[1] Number of analysts for Sales and EPS forecasts may not be same for a company at the same time. We use the average number of analysts in our test instead.

groups.

Secondly, to confirm what we see in the above, we conduct a t-test on the two typical groups for each of the proxies – group 1 and group 5 in each of the categories, to find out whether the value of *ASur_Diff* in the two groups are statistically different. According to table 3 (see Appendix), the difference of ASur_Diff between group 1 and group 5 are 0.0535048, 0.0484361, 0.054059, 0.0397105 for analyst, size, institution and age groups, respectively, and t-score for the four categories are well beyond the significance value on the 99% confidence level. This test confirmed our previous thought and assumption that the better the corporate governance, the smaller the difference.

Thirdly, we performed simple linear regressions on each of the proxies. In table 4 (see Appendix) we can see that the coefficients show high significance on the 99% confidence level, and they are all negative in the four regressions. The result demonstrates negative relationships between number of analysts, market capitalization, institutional ownership, and years since IPO with *Diff_ASur*, which again proved our assumption in hypothesis 3 – as the governance quality increases, the *Diff_Asur* value is decreasing. In conclusion, we can conclude that in general, the better the corporate governance, the less manipulation a firm make on its earnings.

4. Conclusion and Future research plan

This study examines the relationship between firm governance (number of analyst, market cap, institutional ownership percentage, years since IPO as proxies) and surprise of sales (EPS). After using several methods, it shows that each variable is negatively correlated to the surprise of sales (EPS), meaning that the each of these variables is related to the uncertainty that prevails. However, it is also consistent with the idea that larger firms, firms with higher institutional ownership, and more analysts are associated with better transparency and governance. The main contribution of this study is its further examination of the differences between surprise of sales and EPS. We divide our sample into five groups based on the average number of analysts, market cap, institutional ownership percentage and years since IPO and we use t-test to analyze the trend of differences among each group. We find that the difference between the two types of surprises decreases with better governance. The better the governance, the less the difference and the less "games" are being played with earnings management. We also use a linear regression between the difference of absolute surprise of sales and EPS and each of the four variables independently. We find that the result is consistent with our t-test result meaning that not only the mean of difference is getting lower with better governance group by group but that this difference also prevails in a firm fixed-effect regression, suggesting that this difference may be a good proxy for firm governance over time.

The study has implications for analysts' report readers and investors because it helps better prepare the surprise and foresee the accuracy of surprise. It may also help analysts better understand and analyze on corporate governance and earnings management.

However, the study is subject to some limitations. First of all, all surprises we use in this study are the absolute value of surprise that is only aiming for measuring the accuracy of surprise. Secondly, companies in different sectors may also have an impact on surprises. Further research may consider positive surprise and negative surprise adding another dimension that is worth studying since manipulation are expected when the company underperforms. Those topic are left for future research.

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Table 1: Descriptive Statistics

Surprise of sales (Sur_Sales) is the percentage difference between the consensus sales forecast and the actual sales, where consensus sales forecast is defined as the IBES consensus forecast on the date closest but before the actual annual announcement date. Surprise of EPS (Sur_EPS) is the actual EPS minus the consensus EPS divided by the share price in the month of the earnings announcement, where consensus estimated EPS is defined as the IBES consensus EPS estimation on the date closest but before the actual annual announcement date. The absolute surprise of sales (ASur_Sales) and absolute surprise of EPS (ASur_EPS) are calculated as same as the regular surprise except that we take absolute value on the numerators. The difference in Surprise (Diff_Sur) is Sur_Sales minus Sur_EPS. The difference in absolute surprise (Diff_ASur) is Asur_Sales minus Asur_EPS. Institutional ownership (Instown) is the percentage of shares owned by institutional investors on the day when the consensus estimation is made. Year since IPO (Yrs_IPO) is defined as the time (in years) between the forecast made and the firm's IPO date. We initially have more than a million data in this dataset. We have managed to refine this dataset by dropping the companies or time periods that don't have analysts' estimations. We also drop the observations whose sales estimation are zero because we do not consider a zero sales estimation is reasonable and meaningful.

Table 1

	Obs	No. Firms	Mean	SD	p1	p25	p50	p75
Sur_Sales	11,062	1,564	-0.01153	0.16143	-0.68675	-0.02656	0.00361	0.03442
Sur_EPS	11,062	1,564	-0.00420	0.04706	-0.16115	-0.00057	0.00021	0.00130
Diff_Sur	11,062	1,564	-0.00733	0.15908	-0.62877	-0.02570	0.00369	0.03524
ASur_Sales	11,062	1,564	0.07105	0.14541	0.00035	0.01231	0.03105	0.07101
ASur_EPS	11,062	1,564	0.00920	0.04634	0.00000	0.00029	0.00102	0.00336
Diff_ASur	11,062	1,564	0.06185	0.14140	-0.08533	0.00978	0.02777	0.06525
Instown	11,062	1,564	0.61449	0.26468	0.00337	0.44530	0.65596	0.80822
Yrs_IPO	11,062	1,564	20.84723	17.78977	1.19726	7.79178	15.66575	30.03014
MktCap (In millions)	11,062	1,564	9653.955	34377.910	25.594	284.710	955.793	4176.598

Table 2: Multiple Regressions on number of analysts, market capitalization, institutional ownership and time between forecast and IPO

This table provides OLS regression results where the dependent variable is the absolute surprise of sales (ASur_Sales), as well as the absolute surprise of EPS (ASur_EPS). The independent variables include the number of analyst providing the forecast (No_Alyst), market capitalization (MktCap), institutional ownership in the company's stock (Instown), and the time difference (in years) between the forecast date and the company's IPO date (Yrs_IPO). OLS regressions include year and firm fixed-effects. ***, **, and * denote two-tailed significance at the 1%, 5%, and 10% level, respectively. (t-statistics are provided in parentheses).

Table 2

	A-Reg on ASur_Sales	A-Reg on ASur_EPS
Constant	0.1650557***	0.0195572***
	[10.95]	[5.20]
No_Alyst	-0.0010509**	-0.0002891***
	[-2.42]	[-2.67]
MktCap(log in millions)	-0.0000631	-0.0021219***
	[-0.03]	[-4.00]
Instown	-0.0528096***	-0.0069349***
	[-6.80]	[-3.58]
Yrs_IPO	-0.00255***	0.0005308***
	[-6.75]	[5.63]
Adjusted R-squared	0.4387	0.6562

Table 3: Means of difference between absolute surprise of sales and absolute surprise of EPS across subgroups categorized by analysts, size, institutional and age

The table provides mean value of absolute sales surprise (Mean of ASur_Sales) and absolute EPS surprise (Mean of ASur_EPS), as well as the mean of the difference (Mean of Diff_ASur) between these two variables in 5 subgroups based on size (MktCap), institutional ownership (Instown), and age (Yrs_IPO). Among all these groups, quintile 1 is the smallest size (fewest number of analysts, smallest institutional ownership percentage, or shortest time difference between the estimation and IPO date) quintile, and quintile 5 is the largest size (the largest institutional ownership percentage, or the longest time difference between the estimation and IPO date).

Table 3

Analyst Group	1	2	3	4	5		T-Test on difference of Diff_ASur in Group 1
Obs	2,572	2,175	2,085	2,081	2,149	Combined Obs	4,721
Mean of ASur_Sales	0.1160189	0.075523	0.0632914	0.0474442	0.0430757	Combined Mean	0.068775
Mean of ASur_EPS	0.0228885	0.0084461	0.004413	0.0039755	0.0034501	Diff	0.0535048
Mean of Diff_ASur	0.0931304	0.067077	0.0590501	0.0434687	0.0396256	t value	11.2115
t value	22.9557	22.829	21.9934	20.6529	20.6533		
							T-Test on difference of
Size Group	1	2	3	4	5		Diff_ASur in Group 1
Obs	2,220	2,214	2,209	2,214	2,205	Combined Obs	4,425
Mean of ASur_Sales	0.1142434	0.0835613	0.0629494	0.0515582	0.0426741	Combined Mean	0.0646868
Mean of ASur_EPS	0.0254207	0.0095354	0.0051083	0.0035667	0.0022874	Diff	0.0484361
Mean of Diff_ASur	0.0888228	0.0740259	0.0578411	0.0479915	0.0403867	t value	9.9514
t value	19.9858	22.9074	25.2314	21.2425	20.6364		

Continued: Table 3

Institutional Group	1	2	3	4	5		T-Test on difference of Diff_ASur in Group 1
Obs	2,220	2,214	2,209	2,214	2,205	Combined Obs	4,425
Mean of ASur_Sales	0.1256357	0.0654114	0.0584863	0.0523464	0.053108	Combined Mean	0.0754117
Mean of ASur_EPS	0.0232861	0.091447	0.0055237	0.0031635	0.0048174	Diff	0.054059
Mean of Diff_ASur	0.1023496	0.0562667	0.0529626	0.0491829	0.0482906	t value	10.1432
t value	20.7428	22.3185	24.1433	22.7491	24.3946		

Age Group	1	2	3	4	5		T-Test on difference of Diff_ASur in Group 1
Obs	2,221	2,213	2,209	2,300	2,119	Combined Obs	4,340
Mean of ASur_Sales	0.1027805	0.0756736	0.0700689	0.544886	0.0519489	Combined Mean	0.0674756
Mean of ASur_EPS	0.0159163	0.0092778	0.0101077	0.0058257	0.0047952	Diff	0.0397105
Mean of Diff_ASur	0.0868642	0.0663958	0.0599611	0.0486629	0.0471537	t value	8.412
t value	21.4482	20.7728	20.7407	23.2167	20.408		

Table 4: Simple linear regression on absolute surprise difference

This table provides OLS regression results where the dependent variable is the difference between Absolute Surprise of Sales and Absolute Surprise of EPS (Diff_ASur). The absolute surprise difference (Diff_ASur) is defined as the difference between the Absolute Surprise of Sales and Absolute Surprise of EPS. The independent variables include the average number of analysts (Average No_Alyst, average number of analysts for sales and EPS for the particular firm), market capitalization (MktCap, in millions in natural log form), the institutional ownership (Instown) in the company's stock, and the time difference (Yrs_IPO, in years) between the estimation date and the company's IPO date. OLS regressions include year and firm fixed-effects. ***, **, and * denote two-tailed significance at the 1%, 5%, and 10% level, respectively. (t-statistics are provided in parentheses)

Table 4

	A-Reg on Diff_ASur			
Constant	0.0829951*** [28.92]	0.1099482*** [7.96]	0.0948075*** [19.69]	0.1344634*** [20.14]
Average No_Alyst	-0.0027949*** [-7.90]			
MktCap (log in millions)		-0.0068165*** [-3.49]		
Instown			-0.0536384*** [-7.01]	
Yrs_IPO				-0.0034832*** [-11.01]
Adjusted R-squared	0.4055	0.4024	0.4047	0.4092

Graph 1: Absolute surprise of sales and EPS between the year of 2000 and 2016

This graph shows how absolute surprise of sales (ASur_Sales) and EPS (ASur_EPS) change over time from 2000 to 2016. The calculation of ASur_Sales and ASur_EPS is as same as the what we stipulated in the paper and table 1, but with one exception—Instead of showcasing the absolute surprise of sales and EPS for individual companies, what we show here is the average ASur_Sales and ASur_EPS for all U.S listed companies.

Absolute Surprise of Sales and EPS change over time

— Absolute Surprise of EPS   — Absolute Surprise of Sales