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Differences of Opinion and Stock Price Reaction in the Case of Corporate Spin-off Announcements

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ABSTRACT

This study analyzes the effect of changes in the level of differences of opinion (DO) associated with the public disclosure of spinoff divestiture on stock prices. The framework for the empirical analysis is the application of a dynamic DO model of Banerjee and Kremer (2010) to Miller (1977)'s DO model. From this framework, we derive three testable hypotheses, specifically, focusing on the effects of a change in the level of DO from the ex-ante level to the event level caused by the announcements of corporate spinoff engaged and completed by firms in the U.S from 1964 to 2005. We show that the announcements spark sudden and sharp increases in the level of DO. These increases or the disagreement shocks are positively correlated with the abnormal returns generated by the announcements. Furthermore, firms with low ex-ante levels of DO—the mean degree of disagreement among investors about a firm value in a normal trading day—tend to generate greater disagreement shocks. The implication of this negative correlation between the ex-ante level of DO and the disagreement shock is that there should be also a negative relationship between the ex-ante level of DO and the abnormal return. We confirm this relationship. Therefore, the ex-ante level of DO as a firm trait defined by investors' behavioral characteristic can be a significant determinant for the well-known wealth effect or the on-average positive abnormal return gained by corporate spinoffs.

Keywords: Differences of opinion; Corporate spinoff; Trading volume; Event study

1. Introduction

Trading volume around a few days surrounding major corporate news announcements such as earnings, spin-offs and mergers and acquisitions shots up precipitously and then gradually declines to a normal level of trading volume over five to seven

days following the event (Chae 2005; Frazzini and Lamont, 2007; Kim and Son, 2014). This pattern of trading volume behavior is not readily explained by the traditional asset-pricing paradigm for which the assumption of rational expectations—agents share common priors and interpret information homogeneously—is crucial. Recently, Banerjee and Kremer (2010) present a model of disagreement that is motivated by empirically observed levels and patterns of trading volume around the public announcements of major corporate news. While much research on the price-volume dynamics around information events has evolved in rational expectations setting combined

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with information asymmetry, supply shock, or noise traders¹⁾, Banerjee and Kremer argue that to generate these patterns noise processes have to be exogenously given, hence providing not much insight into volume behaviors. Thus, their model considers a setup in which investors have heterogeneous beliefs and interpret information differently. Given that a significant corporate announcement represents an event which triggers substantial disagreement among investors, the model is able to generate a clustering and positive autocorrelation of volume around the event. The key factor that drives such volume pattern is a change in the level of differences of opinion or a jump in disagreement around the announcement. This result is intuitively appealing in that while investors are more or less in agreement in most of time, but the infrequent dissemination of important information to the market spurs large disagreement about the interpretation of the information.

The purpose of our study is to test the implications of the theoretical results of disagreement models with a sample of the announcement of corporate spinoffs by deriving testable hypotheses. Specifically, we investigate whether the level of differences of opinion (henceforth DO) can be a factor that helps to understand price reactions days surrounding the announcement. Our investigation rests on the two major analytical components - the slope of the demand curve which reflects the level of DO about the value of a firm in Miller's (1977) static model and an application of the dynamic models of Banerjee and Kremer (2010) which embrace time variations in that level due to an infrequent arrival of a significant news to the market.

We propose the following three hypotheses. Hypothesis 1 states that the level of DO should spike up around spinoff announcements. Specifically, the extent of disagreement generated by the information of spinoff (i.e., the event level of DO) should be

larger than the non-event or the ex-ante level of DO prior to the disclosure of this information. Given the elevated level of DO which implies an upward change in the slope of the demand curve (i.e., a steeper slope), Hypothesis 2 states that disagreement shock should be positively correlated with announcement abnormal return. The disagreement shock defined as the difference between the event and the ex-ante level of DO is also translated to the magnitude of a change in the slope of the demand curve. Hence, sample firms with greater disagreement shocks relative to their ex-ante levels of DO are expected to earn larger abnormal returns. Finally, Hypothesis 3 states that the ex-ante level DO is negatively correlated with the disagreement shock. This proposition is based on the idea of limited attention which states that cognitively overloaded investors pay attention to only a subset of information (e.g., Hirshleifer and Teoh, 2003; Peng and Xiong, 2006). Because of this type of cognitive constraint, a firm that is out of investors' attention, perhaps due to infrequent coverage by the media, would have a low ex-ante level of DO. In other words, it is less susceptible to heterogeneous interpretations by investors because it is rarely reported by the media. However, when the announcement of a spinoff, which is very likely to receive wide and intense media coverage, becomes publicly, a firm characterized by a low ex-ante level of DO is expected to incur larger disagreement relative to its ex-ante level of DO than is a firm with a high ex-ante level of DO.

We use daily trading volume turnover as a basic variable for estimating a proxy for disagreement. Our use of trading volume is based on recent developments in dynamic DO models in which disagreement is the key variable that drives the positive correlation between trading volume and overpricing (e.g., Hong, Scheinkman, & Xiong, 2005; Jithendranathan, 2008; Scheinkman & Xiong 2003). In other words, the level of trading volume for a firm contains information about the degree of investor disagreement about the firm's value. Therefore, for estimation of the level of DO, we employ and extend Garfinkel (2009)'s the trading volume-based measure of differences of

1) These models that generate trading volume under asymmetric information and unexpected liquidity (noise) shock include Grossman and Stiglitz (1980), Kyle (1985), Admati and Pfleiderer (1988), Foster and Viswanathan (1993), Kim and Verrecchia (1991,1994), and Wang (1994).

opinion (henceforth VDO).

The test results of the three hypotheses are as follows. For Hypothesis 1, we find that there is a sudden increase in the level of DO in the announcement period (i.e., the event level of DO). The mean values of ex-ante DO proxies are about zero. However, event DO proxies spike up such that their mean values hover about 0.65. Indeed, the announcement of a spinoff is a significant information event that invokes huge disagreement among investors. Measuring the disagreement shocks (i.e., ex-ante level of DO minus event level of DO), we find that they are significantly and positively related to announcement abnormal returns as it is postulated in Hypothesis 2. This result substantiates our analytical framework that a change in the level of DO triggered by a public announcement of a spinoff can be interpreted as a shift in the slope of a demand curve in Miller's framework. Moreover, this evidence suggests that the VDOs employed in this study adequately capture the degree of investor disagreement. Finally, consistent with Hypothesis 3, we find that the lower the ex-ante level of DO, the greater the disagreement shock. Across the sample, the correlation between the ex-ante levels of DO and the disagreement shocks is negatively significant regardless of the choice of a VDO. More importantly, this result implies that it is a negative correlation between the ex-ante level of DO and the disagreement shock that gives rise to a negative correlation between announcement abnormal returns and the ex-ante levels of disagreement. We find the evidence in support of this implication. This result suggests that the ex-ante level of DO or the disagreement factor that renders a cross-sectional variation in the sample (i.e., a firm characteristic) can be an important factor that determines the abnormal returns.

In section II, we derive a framework for empirical analysis and propose three hypotheses. The sample selection and its characteristics are described in section III. Section IV delineates the method for estimating the level of DO. The test results are provided and discussed in section V, and Section VI concludes.

II. Hypothesis Development

We consider Banerjee and Kremer (2010)'s dynamic model in the context of Miller (1977)'s static model. As the former model is focused on a change in the level of difference of opinion driven by an information-driven event, we interpret this sudden change in disagreement among investors as a change in the slope of the demand curve for a stock in Miller's framework.

Figure 1 illustrates how the market price of a stock is determined in Miller's model in which the main two constructs are the existence of disagreement among investors about stock value and short-sale constraints. Suppose, in period t , a fixed number of firm A's stock is available for trading at $X=x$ (i.e., the float). Within the traditional asset-pricing paradigm in which investors have an identical estimation of the expected return from the stock, or they agree on its value, its market price is set at P_0 . The demand curve for the stock is flat because there is no disagreement regarding its value. However, the presence of disagreement induces a downward-sloping demand curve shown as Curve A in the figure, and thus the price is set at P_A . Now, Stock A is owned by the optimists (i.e., a small subset of the entire investor population) who have the highest valuation for the stock. Consequently, P_A is greater than P_0 because P_A reflects the valuation of those optimists rather than that of the average valuation of optimistic as well as pessimistic investors. But, under no restrictions in short sales, the price would fall back to P_0 .

Assume further that firm B has similar characteristics as firm A. But they differ only in the degree of disagreement in investors' belief about firm value that investors disagree *less* about the value of firm B than that of firm A. If there are no differences of opinion and no short-sales constraints, stock B would also be priced at P_0 . But, those constraints are market realities, and thus the pessimists are unable to arbitrage mispricing away by selling the stock short due to high costs of or institutional constraints

against engaging in short-sales. However, compared to firm A, a lower divergence of opinion for firm B reduces the steepness of its demand curve, or the slope of its demand curve at ($X=x$) shown as Curve B, and therefore the market price of firm B is determined at P_B . Note that P_B is lower than P_A because firm A has the lower level of disagreement than firm B.

In this setting, we consider Banerjee and Kremer (2010)'s a dynamic trade model of differences of opinion. Unique to their DO model—compared to previous DO models (e.g., Varian 1989; Harris and Raviv, 1993; Kandel and Pearson, 1995)—is that their model allows a time-variation in the level of DO in which a jump in the level of disagreement due to an information event is the key driver. We denote the level of DO in a period prior to a spin-off announcement as $D_i^{ex-ante}$ and call it as the ex-ante level of DO. Likewise, we denote the level of DO reflecting the degree of disagreement incited by the information content of the announcement as D_i^{event} and call it the event level of DO. Therefore, applying a change in the level of DO from the pre-event to the event period into Miller (1977)'s model, we derive testable hypotheses by examining relationships between $D_i^{ex-ante}$ and D_i^{event} , and their effect on prices during the event period of a few days surrounding the actual announcement of spinoff to

the market.

Hypothesis 1. *The level of DO in the event period should be larger than that in the pre-event period.*

Provided that firm A (in Figure 1) announces its decision to spin off one or more of its business units, consider a situation where investors would re-evaluate its value such that they agree on its expected value. More specifically, the announcement does not induce a change in the level of DO, or $D_A^{ex-ante} = D_A^{event}$. Then, the wealth effect of spinoff would suggest an upward shift of its entire demand curve shown as Curve A0, which sets the price at P_{A0} . When there is no disagreement in the first place, the price would be P_{01} . Suppose that the announcement also spurs a large disagreement causing a jump in the level of DO in the event period. In turn, the slope of firm A's demand curve changes so that its curve moves to Curve A2.

Given a sudden hike in the level of DO in the event period and assuming two different event levels of DO ($D_{A2}^{event} > D_{A1}^{event}$) for firm A, the stock price of firm A is set at $[P_{A2}]_{X=x}$ at Curve A2 and $[P_{A1}]_{X=x}$ at Curve A1 in Figure 1. Apparently, the larger the change in the level of DO, the greater the accompanying change in the price. Note that it is the differential changes in the level of DO

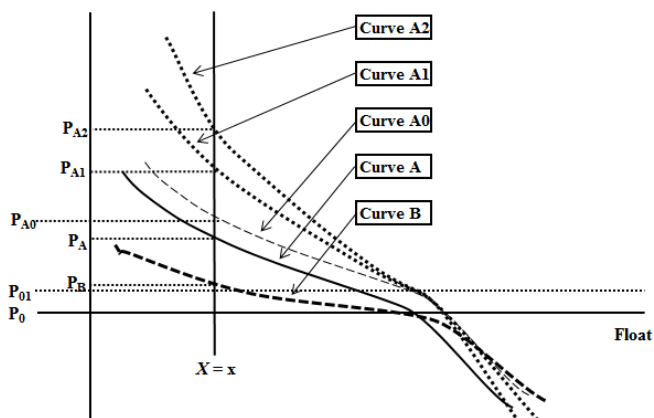


Figure 1. Price reactions by a change in the level of differences of opinion in the announcement period

$(D_{A2}^{event} - D_A^{ex-ante}) \rangle (D_{A1}^{event} - D_A^{ex-ante})$ or the changes in the slope of the demand curve (from Curve A to Curve A2 or A1), that results in the differential price changes $(P_{A2} - P_A) \rangle (P_{A1} - P_A)$. Therefore, by defining the change in the level of DO ($\Delta D_i \equiv D_i^{event} - D_i^{ex-ante}$) as the disagreement shock, we have the following hypothesis.

Hypothesis 2. *Unconditional on the ex-ante level of difference of opinion, or equivalently the slope of demand curve in the pre-event period, there should be a positive correlation between disagreement shock and abnormal return in the announcement period*

We derive additional empirical implications by postulating a relationship between $D_i^{ex-ante}$ and D_i^{event} , and the impact on announcement returns resulted from this relationship. We consider the idea of limited attention (e.g., Hirshleifer and Teoh, 2003; Peng and Xiong, 2006) which states that cognitively overloaded investors pay attention to only a subset of information. Hong and Stein (2007) suggest that if a public announcement of information is released in an attention-grabbing manner (e.g., a wide coverage by news media), perhaps because of weighty consequence of information content of the announcement, these investors' reactions will result in large responses in price and trading volume. Limited and sporadic attention of investors also implies that a firm with less frequent arrival of news or limited coverage by the media prior to the announcement could be a firm with a low level of DO. In the DO model of Scheinkman and Xiong (2003) in which investors interpret news differently, a greater stimulus of the news results in higher disagreement and more trading, as investors' valuations fluctuate more. Thus, if a spinoff announcement is released in an attention-grabbing fashion, we propose that relative to the ex-ante level of DO, a firm characterized by a lower ex-ante level of DO will trigger a greater level of differential interpretation of the announcement than a firm with a higher ex-ante level of DO. In other words, the disagreement shock, or the magnitude

of a change in the slope of the demand curve, would be larger for a "low disagreement firm" than for a "high- disagreement firm."

Hypothesis 3. *The ex-ante level of DO is negatively correlated with the disagreement shock in the event period*

The importance of this hypothesis is that no correlation between the two variables would suggest that $D_i^{ex-ante}$, or the pre-event slope of the demand curve, has no connection to price changes in the announcement period. Then, as discussed for Hypothesis 2, announcement abnormal returns depend only on the slope changes caused by spinoff announcements, or the sizes of the disagreement shocks, ΔD_i . However, if there is a negative relation, it implies that a firm with a lower $D_i^{ex-ante}$ or a flatter pre-event slope of the demand curve will incur a greater magnitude of ΔD_i or a change in the slope. Furthermore, if a low-disagreement firm is affected by a greater disagreement shock (*ie.*, a larger jump in the level of DO during the event period relative to its ex-ante level of DO) than a high-disagreement firm, then the former should earn a higher abnormal return than the latter.

Therefore, we draw an important implication for the cross-sectional variation in abnormal returns in the announcement period, which is resulted from the posited relationship between the ex-ante level of DO and the disagreement shocks. If $D_i^{ex-ante}$ and ΔD_i are negatively correlated, this relationship suggests a negative correlation between the ex-ante level of DO and the abnormal returns. Hence, the ex-ante level of DO can be a significant factor for understanding the cross-sectional variation in the abnormal returns.

III. Sample and Data

A. Sample selection

The initial sample of 255 firms that successfully

completed spinoffs is drawn from the Center for Research in Security Prices (CRSP) distribution file for the period between 1991 and 2005. We focus on non-taxable spinoffs of 232 firms in this paper because the number of taxable spinoffs is small, and the effect of tax is obvious on announcement returns in contrast to tax-free spinoffs.

Further, we extend our sample by combining the sample collected by Vijh (1994) for the period between 1964 and 1990. To maintain integrity of the sample, we follow the sampling procedures of Vijh as closely as possible. His sampling procedure requires identifying a clean or bona fide spinoff. It is defined as a corporate divestiture decision that involves separation of a subsidiary from its parent firm by distributing the shares of the subsidiary to the current shareholders of the parent on pro-rata basis. The separation is such that the parent firm does not hold any shares of the subsidiary; 100 % of ownership is transferred to the current shareholders of the parent, and the subsidiary is established as an independent, publicly traded company in the market after the completion of spinoff. To select the firms that meet the definition of a clean spinoff, which requires the detail of a spinoff transaction including the date of spinoff announcement, we search related articles on Dow Jones News Wire and the Lexis-Nexis database by querying the name of a sample firm. An “unclean” sample meets any of the

following criteria:

- 1) The announcement date or the detail of a spinoff transaction is not available.
- 2) A spinoff distribution is actually new issuance of another class of share by the same firm.
- 3) Spinoffs involve distribution of the shares of other publicly traded firms that are not subsidiaries of parent firms.
- 4) Spinoffs are equity carve-outs in which firms engage in an initial public offering of a fraction of the total shares of a subsidiary to be spun off, and later the remaining fraction is distributed to the current shareholders.
- 5) Either a parent or a subsidiary is merged or acquired by another firm immediately after spin-off.
- 6) The spinoff is partial in which a parent holds a portion of ownership of its subsidiary.
- 7) The sample stocks with CRSP share code other than 10 and 11 (common stocks of firms incorporated in the U.S) are discarded. The eliminated stocks include ADRs (American Depository Receipt), Units, and SBIs (Shares of Beneficial Interest).

Imposing the elimination criteria, we identify the final sample of 120 parent companies of which 9 sample firms spin off two independent subsidiaries in a single instance, hence creating a total of 129 subsidiaries. Finally, combining Vijh (1994)’s sample

Table 1. Sample of Spinoffs from 1964 to 2005

Period	All	NYSE/AMEX	NASDAQ	Change in Focus		
	Par (Sub)*	Par (Sub)	Par (Sub)	Increasing	Non-increasing	% of Increasing
1964 - 70	1(1)	1(1)	0(0)	0	1	0%
1971 - 75	7(7)	5(6)	2(1)	6	1	86%
1976 - 80	17(17)	10(8)	7(9)	14	3	82%
1981 - 85	30(35)	20(18)	10(17)	23	7	77%
1986 - 90	53(56)	45(29)	8(27)	36	17	64%
1991 - 95	30(32)	26(16)	4(16)	24	6	78%
1996 - 00	39(43)	33(31)	6(12)	27	12	67%
2001 - 05	44(47)	33(29)	11(18)	19	25	43%
Total	221(238)	173(138)	48(100)	149	72	67%

*Par: parent company; Sub: subsidiary spun off from a parent company

which covers the period from 1964 to 1990, our final sample consists of 221 parent firms that announced and successfully completed the spin-offs of 238 independent subsidiaries for the period from 1964 to 2005.

We report the distribution of the sample over the study period. In Table 1, we divide the study period into the seven sub-periods, each of which lasts for five years except the first sub-period that lasts for seven years. Few spinoffs occurred before 1976. However, the activity picked up in the subsequent years, and peaked during the 5-year period from 1986 to 1990 with 53 announcements reported. In the final three sub-periods, the spinoff activity declines from the peak, and seems stabilize at 30 to 40 range afterwards. Out of 221 samples, 173 firms are listed on either NYSE or AMEX (about 78% of the sample) and 48 firms on NASDAQ at the time they publicly announced spinoff. Table 1 also presents the numbers of subsidiaries separated from their parents. While 205 firms spun off one single subsidiary, 15 firms created two subsidiaries, and one spun off three subsidiaries, making the total number of the subsidiaries to 238. As can be observed in the Table 1, more subsidiaries are listed on NASDAQ than either NYSE or AMEX.

In the last column, we report the percentages of the parents that engage in focus-increasing spinoffs. It is well known in the spinoff literature that a firm experiences a positive price response upon the announcement of spinoff when the firm separates a subsidiary that is unrelated to the main business of the parent (Daley et al., 1997; Desai and Jain, 1999) Following Desai and Jain (1999), we define a focus-increasing spinoff as a firm that creates a subsidiary whose two-digit primary Standard Industrial Classification (SIC) code is different from that of the parent. Otherwise, we classify a firm as a non-focus-increasing spinoff. In all sub-periods except the last, a majority of the sample is a focus-increasing or cross-industry spinoff. The preponderance of focus-increasing spinoffs in the sample suggests that refocusing strategy is one of primary motivations behind spinoff decision, and thus investors respond

to this type of corporate re-structuring positively as documented in the literature.

B. Summary statistics

As we will discuss in Methodology, trading volume is the principal variable from which we measure the proxies for the level of DO for our sample firms. Therefore, we investigate the characteristics of trading activities along with other relevant market characteristics of the sample firms prior to spinoff announcements. For each sample firm, we obtain daily data on return, price, trading volume (i.e., number of shares traded), and number of shares outstanding from the CRSP. Volume turnover is the ratio of trading volume to number of the shares outstanding. We further transform volume turnover by taking the natural logarithm of volume turnover to get log turnover.

The literature on trading volume tends to study exclusively NYSE/AMEX stocks, and suggests a separate investigation between NYSE/AMEX and NASDAQ stocks.²⁾ In our study we include NASDAQ firms by adjusting the overstatement of trading volumes on NSADAQ firms. Following Anderson and Dyl (2005), we scale down raw turnover of NASDAQ sample firms by 38% after 1997 and by 50% before 1997. Though this procedure would make NASDAQ firms' turnovers roughly comparable with those on NYSE, it is admittedly a very rough approximation.

In Table 2, we present the summary statistics of various daily trading activity measures (trading volume, volume turnover, and log turnover) and of the other firm characteristics (return and price) for a 250-trading-day period ending 10 days before the

2) Because our samples include firms listed on NYSE/AMEX (173) and NASDAQ (48), trading volumes are not comparable across the sample firms. It is primarily due to different market structure of these exchanges. Specifically, NASDAQ is a dealer's market in which a dealer is one side of every transaction, therefore a transaction being double counted. In contrast, NYSE and AMEX are auction markets in which a majority of transactions are between actual buyers and sellers

Table 2. Stock market characteristics of the sample

Size Group	Obs	Mean	Std	Skewness	Kurtosis
Trading volume (in 1,000)					
1	23	35	48	4.43	32.62
2	37	79	79	4.51	35.35
3	41	167	158	4.23	31.30
4	105	1295	850	3.58	25.84
All samples	206	712	484	3.97	29.39
Volume turnover (%)					
1	23	0.26	0.38	4.49	33.13
2	37	0.30	0.31	4.54	35.73
3	41	0.33	0.39	4.30	32.15
4	105	0.38	0.31	3.58	25.93
All samples	206	0.34	0.33	4.00	29.73
Log turnover					
1	23	-6.97	1.34	-0.60	1.77
2	37	-6.68	0.99	-0.25	1.11
3	41	-6.43	0.89	0.03	0.50
4	105	-6.03	0.60	0.28	0.90
All samples	206	-6.33	0.81	0.04	0.96
Return (%)					
1	23	0.17	3.22	0.41	5.08
2	37	0.01	3.09	0.34	5.46
3	41	0.03	2.60	0.12	5.05
4	105	0.04	2.15	0.09	4.71
All samples	206	0.05	2.53	0.18	4.95
Price					
1	23	10.54	6.90	-1.60	9.50
2	37	16.85	4.23	-1.09	12.90
3	41	23.04	5.22	-0.84	10.78
4	105	40.03	5.22	0.21	-0.33
All samples	206	29.19	5.23	-0.44	5.36

announcement of a spinoff. The reported figures are the cross-sectional means of the summary statistics (mean, standard deviation, skewness, and kurtosis). The samples are sorted into four size groups. Group 1, which is the smallest, consists of firms with size decile 1 to 6, Group 2 with size decile 7 to 8, Group 3 with size decile 9, and Group 4 with size decile 10. A sample firm based on its market capitalization by the end of the year prior to its spinoff announcement year is assigned to one of the deciles constructed

with the same year-end market capitalizations of the universe of NYSE/AMEX/NSDAQ firms.

Consistent with the previous studies on trading volume (e.g., Llorente *et al.*, 2002; Lo and Wang, 2000; Morse *et al.*, 2014), trading volume and volume turnover increase with firm size as does the prices of the sample firms despite the small sample size of our study. As can be seen in the table, across the sample trading volume is far more variable than volume turnover. While the mean trading volume

of Group 4 is approximately 36 times higher than that of Group 1, it is 1.4 times for volume turnovers. Unlike trading volume which is the actual number of the shares changed hands during a day, volume turnover is the ratio that measures the intensity of trading activity after taking account of all the shares of a company available for trading. Even though both measures of trading activity are a generally accepted measure of trading activity, the information content embedded in them might be different as it is suggested by dissimilar distributional characteristics between trading volume and volume turnover across our sample firms.

Furthermore, the distribution of daily trading volume and volume turnover are highly non-normal with positive skewness and fat tails. Thus, due to the unstable statistical distribution of trading volume and turnover, a mean value derived from them would be suspect. In contrast, the distribution of log turnover approximates a normal distribution with skewness and kurtosis close to zero in all size groups, though Group 1 and 2 exhibit modest leptokurticity. Thus, because it is crucial to have a variable with a stable distribution in estimation of the level of DO for our sample as a firm characteristic, we use log turnover as a baseline data.

IV. Methodology

In testing the hypotheses, it is critical to have an empirical measure that properly captures the degree of disagreement among investors about the value of a sample firm. More specifically, this measure should allow us to estimate the level of DO in the pre-event as well as the event period, namely $D_i^{ex-ante}$ and D_i^{event} . That is, while D_i^{event} should reflect investors' disagreement stemming from spinoff announcement, $D_i^{ex-ante}$ should mirror a normal degree of disagreement in an ordinary trading day (i.e., in absence of spinoff information) prior to the

announcement.

However, the extant proxies developed to measure disagreement (breadth of ownership in Chen *et al.* (2002) and the dispersion of analysts' earnings forecasts in Diether *et al.* (2002)) are infeasible for our analysis. First, the data used for both proxies are recorded in a low frequency (monthly for the dispersion and quarterly for breadth of ownership). Second, these two proxies are employed in testing the predictive power of the level of DO for stock returns in the Miller (1977)'s static setting, implying that they may not be able to capture a change in disagreement driven by a flash information event like a public announcement of corporate spinoff.

Notwithstanding, the progress in the literature (Harrison and Kreps, 1978; Hong *et al.*, 2005; Scheinkman and Xiong, 2003) that develops dynamic models with disagreement provides theoretical ground for using trading volume to derive the level of investor disagreement. These models generate a speculative component in prices by excessive trading volume and volatility when investors are overconfident, which is a major source of disagreement. Hence, the main prediction of these dynamic models is a positive correlation between the level of trading volume and the degree of overpricing. That is, the higher the level of disagreement or the greater the volatility in disagreement, the more intensive the trading activity and the higher the price. In other words, trading activity contains information about the level of DO regarding the value of a firm among investors.

On an empirical front, a more relevant proxy for the divergence of opinion embedded in trading volume can be measured if a portion of trading volume generated from disagreement can be isolated. But, this would require a testable equilibrium model of trading volume, which is still in a very early stage.³⁾

3) Though Lo and Wang (2000) develop a model for trading volume within a framework of traditional Capital Asset Pricing Model (CAPM), it only captures trading volume generated by portfolio rebalancing needs. They concede that a complete or a unified model would have to incorporate such factors as information asymmetry, idiosyncratic risks, transaction costs, and other forms of market imperfections.

Despite the lack of the model, Gafinkel (2009) develops statistical measurements for the level of DO using trading volume, which he refers to as volume-based proxies for opinion divergence. The importance of his finding is that the disagreement proxies estimated from trading volume have the highest power in explaining the cross-sectional variation of the benchmark for disagreement relative to other known DO proxies such as return volatility or the dispersion of analysts' earnings forecasts.

Therefore, we use daily trading volume turnover as a basic ingredient for the estimation of both $D_i^{ex-ante}$ and D_i^{event} . Following Garfinkel's (2009) estimation method and expanding it, we propose four volume-based measures of differences of opinion (VDO). We start with daily volume turnover of a stock which is defined as the ratio of the number of shares traded to the number of shares outstanding at the end of the trading day. We further transform it by taking the natural logarithm of daily volume turnover (henceforth log turnover) and denote it as $LNTO_{i,t}$.⁴⁾ We use log turnover itself as a measure of VDO. From $LNTO_{i,t}$, we subtract the market-wide log turnover ($MKLNTO_{i,t}$), which gives the market-adjusted log turnover or $MATO_{i,t}$. To measure the market-wide log turnover for day t , we compute a value-weighted average of daily log turnovers of all ordinary common stocks in NYSE and AMEX. Further, as Tkac (1999) suggests, we correct for the average level of idiosyncratic aspects of a firm's trading volume by subtracting the mean of $MATO_{i,t}$ over a 200-day period prior to day t from $MATO_{i,t}$. Hence, the unexplained volume on day t , $UV_{i,t}$ is given by

$$\begin{aligned}
 UV_{i,t} &= MATO_{i,t} - \\
 &\frac{1}{200} \sum_{k=t-200}^{t-1} MATO_{i,k} \text{ where } MATO_{i,t} \\
 &= LNTO_{i,t} - MKLNTO_{i,t}
 \end{aligned}
 \tag{1}$$

4) Lo and Wang (2002) show that the most proper measures for trading activity is volume turnover under a reasonable assumption that all investors hold the same relative proportion of risky assets all the time (i.e. two fund separation theorem). Hence, they argue that it provides the sharpest empirical implications.

For the second VDO, we employ a market model for log turnovers analogous to a market model for stock returns. A support for the use of the model comes from the work of Tkac (1999) and Lo and Wang (2002). In particular, building an equilibrium model for turnover assuming a K -funds separation theorem, Lo and Wang show that turnover has a linear K -factor structure. And their principal component analysis for turnovers of NYSE/AMEX stocks for the period from 1962 to 1996 show that the first component explains between 70% and 85% of the variation in turnover. Thus, we estimate a one-factor market model for log turnover over the 200-day period as in the measure of the unexplained volume.

$$\begin{aligned}
 RESD_{i,t} &= LNTO_{i,t} - \\
 &E[LNTO_{i,t}] \text{ where } E[LNTO_{i,t}] \\
 &= \alpha_i + \beta_i MKLNTO_{i,t}
 \end{aligned}
 \tag{2}$$

where $RESD_{i,t}$ is a residual part of trading volume for firm i on day t . A close look at equation 6 reveals that it is similar to the unexplained volume in that the intercept term captures the on-average portion of turnover specific to the firm. However, the coefficient of $MKLNTO_{i,t}$ captures the firm-specific sensitivity to the market-wide turnover.

Finally, the third VDO is the standardized unexpected volume. As Garfinkel (2009) notes, UV and $RESD$ assume that new information about stock i arrived on day t , which changes investors' mean valuation of the stock and stimulate trades, has the same effect on trading volume on day t as in our estimation period of $(t-200, t-1)$. To control for the effect of the arrival of new information on trading volume on day t , we estimate the following equation:

$$\begin{aligned}
 LNTO_{i,t} &= \phi_i + \theta_{1,i} |r_{i,t}^+| + \theta_{2,i} |r_{i,t}^-| + \epsilon_{i,t}, \\
 SUV_{i,t} &= \frac{\epsilon_{i,t}}{\sigma_{i,t}}
 \end{aligned}
 \tag{3}$$

This model is built on the empirical evidence that trading volume is related differently to price changes, depending on the sign and the magnitude of a price change (e.g., Karpoff, 1987; Kim and Verrecchia,

1991, 1994). We assume a linear relationship between price changes and trading volume, which is captured by $\theta_{1,t}$ and $\theta_{2,t}$ for positive and negative price changes respectively. The superscripts on the absolute value of a daily return indicate whether the return is positive or negative on day t . The intercept captures the mean level of liquidity-driven trading volume specific to the firm. Hence, $\varepsilon_{i,t}$ represents the portion of trading volume that is not related the average level of the firm's liquidity and the information effect on trading volume due to the arrival of news. Finally, we scale $\varepsilon_{i,t}$ with the standard deviation of the residuals ($\sigma_{i,t}$) to get the standardized unexplained volume or $SUV_{i,t}$ on day t .

Thus, using daily estimates of a VDO and employing an event study design, we measure our two main variables: $D_i^{ex-ante}$ and D_i^{event} for each sample firm. We define the pre-event or nonevent period as a 250-trading-day period ending 11 trading days prior to the announcement date (AD) or the time window of (260-AD, 11-AD). To derive an adequate value for $D_i^{ex-ante}$ which represents the nonevent or normal level of disagreement about firm i 's value before the announcement of spinoff, we take the mean of daily estimates of a VDO over the pre-event period. Thus, for firm i , the *ex-ante* level of DO is defined by

$$D_i^{ex-ante} = \frac{1}{250} \sum_{t=-260}^{t=-11} VDO_{i,t} \quad (4)$$

Likewise, the event period is defined as a three-day period surrounding AD, the window of (AD-1, AD+1). To be consistent with the measurement of $D_i^{ex-ante}$, we also estimate D_i^{event} by calculating the mean of daily estimates of a VDO over the event period, which reflects the event level of disagreement spurred by the announcement to the market.

$$D_i^{event} = \frac{1}{3} \sum_{t=-1}^{t=1} VDO_{i,t} \quad (5)$$

V. Empirical Results

A. Disagreement and abnormal return in the announcement period

For the estimation of abnormal returns, we use two different benchmarks: the mean of daily stock returns over the pre-event period (AD-260, AD-11), and the expected stock return estimated with the parameters of the market model for daily return. The market returns are the CRSP value-weighted portfolio returns for all NYSE/AMEX/NASDAQ stocks. For each day in the event period (AD-1, AD+1), we subtract the mean return from a daily return to get

Table 3. Abnormal returns around the announcement period

Date	Obs	Market-model adjusted abnormal return		Mean-adjusted abnormal return	
		(%)	(<i>t</i> -stat)	(%)	(<i>t</i> -stat)
-10	202	0.134	(0.833)	0.109	(0.640)
-9	202	-0.138	-(0.845)	-0.134	-(0.765)
-8	202	0.169	(1.006)	0.204	(1.105)
-7	202	0.180	(1.199)	0.218	(1.314)
-6	202	-0.122	-(0.792)	-0.131	-(0.842)
-5	202	-0.058	-(0.276)	0.058	(0.261)
-4	202	-0.141	-(0.808)	-0.185	-(0.955)
-3	202	0.103	(0.505)	0.022	(0.104)
-2	202	0.119	(0.472)	0.157	(0.607)
-1	202	1.367	(5.230)	1.478	(5.519)
(AD) 0	202	1.647	(3.901)	1.589	(3.756)
1	202	0.439	(1.541)	0.545	(1.956)
2	202	-0.335	-(2.043)	-0.254	-(1.449)
3	202	-0.127	-(0.708)	-0.052	-(0.286)
4	202	-0.288	-(1.338)	-0.184	-(0.809)
5	202	-0.070	-(0.304)	-0.163	-(0.658)
6	202	0.142	(0.813)	0.130	(0.681)
7	202	-0.228	-(1.631)	-0.190	-(1.221)
8	201	-0.214	-(1.217)	-0.134	-(0.723)
9	201	0.257	(1.253)	0.158	(0.757)
10	200	0.097	(0.610)	0.127	(0.741)
CAR (AD-1, AD+1)		3.452	(6.160)	3.612	(6.400)

a mean-adjusted abnormal return. Similarly, a market-adjusted abnormal return is obtained by daily return minus the expected stock return. To test statistical significance of abnormal return (AR) under the null of zero abnormal return, we use the following *t*-statistic for AR on an event day *t*, which is given by

$$t_{AR} = \frac{\overline{AR}_t}{\frac{\sigma(\overline{AR}_t)}{\sqrt{n}}} \quad (6)$$

The same approach for testing the level of disagreement on an event day *t* is implemented as follows:

$$t_{VDO} = \frac{\overline{VDO}_t - D(\overline{VDO})^{ex-ante}}{\frac{\sigma(\overline{VDO}_t)}{\sqrt{n}}} \quad (11)$$

$D(\overline{VDO})^{ex-ante}$ is the sample mean of the ex-ante level of DOs, while \overline{VDO}_t is the sample mean of the level of DO on an event day. The standard deviation of $\sigma(\overline{VDO}_t)$ is measured from the time-series of \overline{VDO}_t over the pre-event period.

In Table 3, we report daily abnormal return for the time window of (AD-10, AD+10). For market adjusted abnormal return, since there is no material difference in either using the value-weighted or the equal-weighted market returns, we present abnormal returns computed with the value-weighted market returns.

As can be seen in the table, the abnormal returns hover around zero with the insignificant test statistics until AD-2. However, during the event period starting from AD-1 the abnormal return becomes significantly positive. The sample mean of the market-adjusted and mean-adjusted abnormal returns cumulated over the event window of (AD-1, AD+1) equals to 3.45% and 3.61% with the *t*-statistic of 6.16 and 6.40, respectively. Our result is in confirmation of the stylized fact of the spinoff literature that spinoff announcements induce positive market reaction,

which is also known as wealth effect. For example, Veld and Veld-Merkoulova (2009) review 26 empirical studies on spinoff announcements, and find that spinoff announcements generate, on average, a 3.02% of abnormal return. The significantly positive market reaction starting AD-1 suggests a leakage of news or partial anticipation of news by the market. Hence, for testing our hypotheses, we use the cumulative abnormal return (CAR) over the event period as the price changes for the sample.

In Table 4, we report the cross-sectional mean of the event level of DO for each day from AD-10 to AD+11. This result shows the change in the extent of disagreement over the 21 trading-day period. Notably, prior to the event period, the disagreement level does not significantly deviate from its mean value or the ex-ante level of DO. Starting from AD-1, however, it begins to spike up, peaks in the actual announcement date, and then gradually declines until AD+10. Even after the announcement date, the level of DO is significantly larger than the ex-ante level of DO. This pattern in abnormal trading activity has been also observed for other important corporate announcements.⁵⁾ In the rational expectation paradigm in which investors have common priors and interpret information in the same way, the same pattern does not emerge since investors reach consensus quickly regarding the firm value following the announcement (Hong and Stein, 2007). This pattern seems to suggest that investors continue to trade based on their own interpretations even several days after the announcement. Thus, the result of Table 3 and 4 is an empirical confirmation of the main result of disagreement models that the positive correlation between trading volume and stock return seems to be driven by divergent opinions of investors. In the next section, by testing three hypotheses we proposed, we buttress our case that the main factor effectuating such relationship is disagreement among investors.

5) For example, see Figure 4 in Hong and Stein (2007) for quarterly earnings announcement and Table 3 in Chae (2005) for acquisition announcement.

Table 4. Event Level of DO in the Announcement Period

Date	Obs	<i>LNTO</i>		<i>UV</i>		<i>RESD</i>		<i>SUV</i>	
-10	202	-6.27	(0.63)	0.04	(0.89)	0.04	(0.84)	0.07	(0.90)
-9	202	-6.32	(0.11)	-0.01	-(0.01)	-0.02	-(0.06)	0.00	-(0.05)
-8	202	-6.26	(0.73)	0.03	(0.81)	0.03	(0.63)	0.01	(0.16)
-7	202	-6.29	(0.49)	0.01	(0.44)	0.02	(0.44)	-0.01	-(0.18)
-6	202	-6.37	-(0.45)	-0.04	-(0.43)	-0.03	-(0.24)	-0.07	-(1.01)
-5	202	-6.28	(0.56)	0.02	(0.65)	0.03	(0.61)	0.00	(0.05)
-4	202	-6.32	(0.10)	-0.02	-(0.04)	-0.01	-(0.04)	0.04	(0.45)
-3	202	-6.20	(1.42)	0.11	(1.80)	0.10	(1.71)	0.12	(1.62)
-2	202	-6.20	(1.48)	0.10	(2.03)	0.10	(1.99)	0.12	(1.58)
-1	202	-5.90	(4.57)	0.38	(5.61)	0.38	(5.56)	0.34	(4.16)
(AD) 0	202	-5.38	(10.94)	0.91	(13.84)	0.89	(13.46)	0.88	(10.26)
1	202	-5.65	(7.46)	0.63	(9.19)	0.62	(8.78)	0.77	(8.54)
2	202	-5.84	(5.99)	0.46	(7.71)	0.44	(7.29)	0.64	(7.82)
3	202	-6.02	(3.40)	0.27	(4.41)	0.27	(4.21)	0.41	(4.98)
4	202	-6.05	(3.44)	0.26	(4.53)	0.25	(4.29)	0.36	(4.55)
5	202	-6.01	(4.15)	0.29	(5.04)	0.28	(4.88)	0.29	(3.73)
6	202	-6.12	(2.39)	0.19	(3.09)	0.18	(2.92)	0.20	(2.67)
7	202	-6.21	(1.26)	0.11	(2.23)	0.10	(1.89)	0.15	(2.08)
8	201	-6.10	(2.76)	0.22	(4.07)	0.22	(3.86)	0.27	(3.65)
9	201	-6.14	(2.16)	0.18	(2.89)	0.17	(2.69)	0.20	(2.85)
10	200	-6.14	(2.18)	0.15	(2.53)	0.15	(2.44)	0.22	(2.66)
\overline{D}^{event}		-5.64		0.64		0.63		0.66	
$\overline{D}^{ex-ante}$		-6.33		-0.01		-0.01		0.00	
Difference		0.68	(8.94)	0.65	(12.96)	0.64	(12.62)	0.66	(10.83)

Note: *t*-statistics are reported in the parenthesis.

B. Test result for the hypotheses

At the bottom of Table 4, we provide the statistical test result for Hypothesis 1. In support of it, the mean of the event levels of DO is significantly larger than that of the ex-ante level of DO in all VDOs with the *t*-statistic greater than 8.94. Thus, as the news of a corporate spinoff arrives in the market, it spurs differential interpretation among investors regarding the prospect of the firm following spinoff.

For our second hypothesis, we test for a positive correlation between disagreement shock and abnormal return in the announcement period with our analytical framework of Banerjee and Kremer (2010)'s time-varying level of DO with Miller (1977)'s DO

model. In Miller (1977)'s model, it is the presence of disagreement about the valuation of the stock that induces its demand curve downward-sloping. Thus, in this two-period setting (i.e., the pre-event and the event period), a change in the level of DO implies a corresponding change in the slope of the demand curve. Since a spinoff announcement entails no change in the float (i.e., the supply curve), firms affected by a larger change in the slope of a demand curve, or a greater change in the level of DO, should have larger abnormal returns. Our primary focus is on the magnitude of a change in the level of DO or 'disagreement shock' and its effect on the prices of the sample firms.

We define the disagreement shock (henceforth

Table 5. Disagreement shock and abnormal return

Rank	Obs	LNT0		UV		RESD		SUV	
		Shock	CAR	Shock	CAR	Shock	CAR	Shock	CAR
(Low)1	41	-0.30	0.59	-0.29	0.67	-0.29	0.85	-0.55	1.12
2	42	0.29	2.59	0.28	0.99	0.26	0.40	0.21	5.43
3	41	0.58	2.48	0.58	2.42	0.55	3.26	0.62	4.53
4	42	1.02	3.57	0.96	4.95	0.95	4.03	1.07	2.33
(High)5	41	1.84	8.06	1.74	8.26	1.74	8.79	1.96	3.82
207									
Diff_mean		2.14 ^a	7.47 ^a	2.03 ^a	7.59 ^a	2.03 ^a	7.94 ^a	2.51 ^a	2.70 ^c
Diff_median		1.95 ^a	7.42 ^a	1.76 ^a	8.39 ^a	1.86 ^a	8.39 ^a	2.25 ^a	3.86 ^a
Correlation			0.33 ^a		0.39 ^a		0.38 ^a		0.14 ^b

Note: ^{a,b,c} indicate the significance at the 1, 5, 10% level respectively.

SHOCK) as a difference between the event and the ex-ante level of DO or $(\Delta D_i \equiv D_i^{event} - D_i^{ex-ante})$.

As we discussed in

Methodology section, $D_i^{ex-ante}$ is measured to reflect the normal level of DO of a firm in a typical trading day and thus can be considered as a pre-spinoff firm characteristic. Similarly, D_i^{event} proxies for the elevated or abnormal level of DO in the announcement period.

In Table 5, we sort the sample firms into the quintiles according to their sizes of SHOCK, and compute the mean and the median of CAR and SHOCK in each quintile. We do not report the median values due to limitation in space and immaterial difference in result. Confirming Hypothesis 2, as the mean value of SHOCK in each quintile increases, so does CAR. The *t*-statistics for the difference in the mean CAR between the top and the bottom quintiles are significant at the 1 % level regardless of a VDO we choose to measure SHOCK except SUV, which is significant at the 10 % level. The Wilcoxon-rank-sum tests for the difference in the medians affirm the *t*-test result as well. Moreover, in the cross-section of the entire sample, SHOCK is significantly and positively related to CAR with the Spearman rank correlation ranging from 0.39 to 0.14.

Frazzini and Lamont's (2006) study of stocks returns and trading volume around earnings announcement offers the findings that can be interpreted

within our analytical framework. They document that abnormal returns are on average positive, and trading volume increases sharply around earnings announcement dates. Since those announcements include both good and bad news, the on-average positive abnormal return (i.e., the earnings announcement premium) can be explained by disagreement shock resulted from a heightened level of disagreement among investors that is brought forth by earnings announcements. The elevated level of disagreement is also reflected in abnormally high trading volume during the earnings announcement period. Note that this event itself does not involve a change in the float as the announcement of a spinoff does not. As we discussed in the preceding two sections, spinoff announcements also elicit such market reactions as highly elevated level of trading volume and positive abnormal return.

Finally, we examine a relationship between the ex-ante level of DO and the event level of DO, and its linkage to the price reactions of the sample stocks in the announcement period. In Hypothesis 3, we posit that the pre-event level of DO is negatively correlated with disagreement shock. This proposition is based on the idea of limited attention on the part of investors which states that cognitively overloaded investors pay attention to only a certain subset of information.

Because of this type of cognitive constraint, a firm that, for example, is not frequently covered by

Table 6. Ex-Ante Level of DO, disagreement shock and abnormal return

Rank	Obs	LNT0			UV			RESD			SUV		
		Ex Ante	Shock	CAR	Ex Ante	Shock	CAR	Ex Ante	Shock	CAR	Ex Ante	Shock	CAR
(Low)1	40	-7.69	0.79	5.47	-0.28	0.86	5.72	-0.27	0.89	5.74	-0.33	0.98	4.50
2	41	-6.72	0.82	5.15	-0.09	0.66	3.58	-0.08	0.59	3.44	-0.13	0.73	5.85
3	40	-6.25	0.67	2.84	0.00	0.67	2.60	0.00	0.65	2.78	0.00	0.64	1.42
4	41	-5.86	0.70	2.05	0.07	0.58	1.88	0.07	0.45	2.08	0.14	0.63	1.18
(High)5	40	-5.13	0.43	1.73	0.23	0.50	3.52	0.22	0.63	3.25	0.32	0.33	4.31
	202												
Diff_mean		2.56 ^a	-0.36 ^b	-3.74 ^c	0.51 ^a	-0.36 ^c	-2.20	0.49 ^a	-0.26	-2.49	0.65 ^a	-0.65 ^a	-0.19
Diff_median		2.24 ^a	-0.22 ^b	-5.15	0.42 ^a	-0.66	-4.32 ^b	0.42 ^a	-0.59	-4.90 ^b	0.58 ^a	-0.63 ^a	-3.37 ^c
Correlation 1			-0.15 ^b			-0.15 ^b			-0.14 ^b			-0.22 ^a	
Correlation 2				-0.19 ^a			-0.22 ^a			-0.22 ^a			-0.19 ^a

Note: ^{a,b,c} indicate the significance at the 1, 5, 10% level respectively.

the media would have a low level of DO. In other words, it is less susceptible to heterogeneous interpretations by investors. However, when the firm announces its decision to spin off, which is very likely to receive a wide and intense media coverage, this firm characterized with a low ex-ante level of DO (i.e., a low-disagreement firm) is expected to incur a larger disagreement shock than a firm with a high ex-ante level of DO (i.e., a high-disagreement firm). Consequently, consistent with Hypothesis 2 the former should earn a higher abnormal return than the latter. More importantly, it is this relationship— a negative correlation between the ex-ante level of DO and disagreement shock— that gives rise to a negative correlation between the ex-ante level of DO and abnormal return.

We sort the sample firms into the quintile based on the values of proxies for their ex-ante levels of DO. Table 6 shows the mean and the median of the ex-ante level of DO, SHOCK, and CAR in each quintile. We omit reporting the medians for the same reason as Hypothesis 2. In all VDOs, as the ex-ante level of DO increases, SHOCK and CAR decrease. The difference in the mean of SHOCK and CAR between the top and the bottom quintile are negative, but the *t*-test and the Wilcoxon-rank-sum test results are insignificant in some VDOs.

However, across the entire sample we find that

the correlations between the ex-ante level of DO and SHOCK (rank correlation 1) are significantly negative in all VDOs. The correlations range from -0.14 to -0.22, and are significant at least 5 % level. This result confirms Hypothesis 3 that low-disagreement firms tend to experience larger disagreement shocks— greater changes in the level of DO in the announcement period— than high-disagreement firms. Furthermore, we confirm an inverse relation between the ex-ante DO and CAR. As reported in Table 6, Spearman rank correlations (Rank correlation 2) range from -0.19 to -0.22 in all VDOs, and are significant at the 1 % level. As we postulated, it is the negative relationship between the ex-ante level of DO and SHOCK that brings about a negative correlation between the ex-ante level of DO and CAR.

In other words, compared to a high-disagreement firm, a low-disagreement firm, or a firm with a low slope of the demand curve, sustains a large (negative) change in the slope in the announcement period because it is affected by a large disagreement shock triggered by the spinoff announcement. Thus, the CAR or the price change is positively greater for the low-disagreement firm than for the high-disagreement firm. Therefore, it follows that the ex-ante level of DO can be potentially a significant factor for explaining the cross-sectional variation in abnormal returns days surrounding spinoff announcements. It could mean

that wealth effect of spinoff could be in significant part due to the extent of differences of opinion

VI. Conclusion

Excessive trading volume accompanied by overpricing in the U.S stock market (especially the IT boom in the late 1990) and highly abnormal volume behavior around an information event such as earnings, acquisition, and spinoff announcements are not easily explained by the traditional asset pricing models because these models have no role for trading volume. However, the development in disagreement models attempts to overcome this difficulty, and are able to explain a positive relation between trading volume and overpricing. Unlike these risk-based rational asset pricing models, the disagreement models set forth a market model in which investors have heterogeneous beliefs and interpret public information differently, and that investors are bounded by short sales restrictions.

Building on differences-of-opinion (DO) models of Banerjee and Kremer (2010) and Miller (1977), we propose three hypotheses, specifically examining changes in the levels of DO among investors and their impacts on price reactions days surrounding the announcements of corporate spinoffs. We use a sample of spinoffs undertaken by the U.S public firms from 1964 to 2005, and estimate the proxies for disagreement from trading volume.

Our results are as follows. The announcements of spinoffs set off a sudden jump in the level of DO, which reflects widely differential interpretation about the news among investors (Hypothesis 1). Defining this precipitous increase in the level of DO as disagreement shock, we find that it is positively related to abnormal return generated from the announcement. The ex-ante level of DO which we define as the level of DO in a typical trading day—in contrast to the level in the announcement period (i.e., the event level of DO)—is negatively correlated with

disagreement shock (Hypothesis 3). Furthermore, we show that it is the linkage between the ex-ante level of DO and the disagreement shock that brings about a negative correlation between the ex-ante level of DO and the abnormal return. Therefore, the important implication is that the ex-ante level of DO as a firm-specific character can be a significant factor that explains the variation in the abnormal return.

The contribution of our paper is twofold. First, we offer an empirical confirmation of the relevance of disagreement models. Especially, our focus is the effect of a change in the level of disagreement on price change in the case of corporate spinoff announcement. Second, while much of literature on corporate spinoff attempt to seek out the rational determinant for the on-average gain from the spinoff announcement, we offer evidence that a behavioral characteristic of investors, namely differences of opinion can be a vital determinant.

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