Divergence of Opinion, Uncertainty, and the Quality of Initial Public Offerings

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We explore the relation between investor uncertainty, divergence of opinion, and the performance of initial public offerings (IPOs). We examine three opening-day proxies: the percentage opening spread, time of first trade, and flipping ratio. After controlling for issue quality, we find that all three variables provide significant explanatory power of IPO returns. Specifically, we associate a wide opening spread, late opening trade, and a high flipping ratio with poor long-run returns. The results support Miller (1977), who suggests that greater divergence of opinion or uncertainty about an IPO can generate short-run overvaluation and long-run underperformance.

Few corporate events are more momentous than the first trading day following a firm's initial public offering (IPO). Given no prior trading history and limited financial information, the opinion about a firm's subsequent performance can range from "this is the next Microsoft" to "this dog will not see its first birthday." Some IPO investors certainly experience outstanding long-term returns, but the poor aftermarket performance of the average issue is widely documented by Aggarwal and Rivoli (1990), Ritter (1991), and Loughran and Ritter (1995), among others.

We explore the long-run predictive power of early market indicators of divergence of opinion, uncertainty, and IPO quality. While the literature proposes numerous explanations for the initial underpricing and poor long-run performance of IPOs, we focus on a theory originally proposed by Miller (1977), which has received limited attention.[1]

Miller contends that in markets with restricted short selling, such as IPOs, prices are determined by the optimistic investors "who think highly enough of the investment merits of the new issue to include it in their portfolio (p. 1156)." While pessimists wait until short sale restrictions are lifted, early aftermarket prices may exceed the aggregate value predicted across all potential investors. Eventually, as short sale restrictions ease, and additional information becomes available about the firm, prices are free to approach their fundamental value. Miller proposes that a wide divergence of opinion among IPO investors can lead to short-run overvaluation and greater

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[1]Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Welch (1989), and Garfinkel (1993) explore underpricing as a credible signal of IPO quality. Rock (1986) models underpricing as compensation to uninformed investors for participating in the offering. Mauer and Senbet (1992) argue that incomplete spanning and limited investor access to the primary issue market contribute to underpricing. Benveniste and Spindt (1989) assert that underpricing provides incentives for investors to reveal their private information during the book-building process. Shiller (1990) proposes that the IPO market is subject to fads and bandwagon effects that artificially inflate aftermarket prices. Drake and Vetsuypens (1993) conclude that underpricing does not provide insurance against legal liability. Finally, Aggarwal, Krigman, and Womack (2001) examine underpricing as a strategic decision to maximize managerial wealth by the sale of shares after the lockup expiration.

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long-run underperformance.[2]

Miller's (1977) predictions depend on the presence of short sale constraints. We argue that institutional controls make short sales difficult in the early post-offering period. National Association of Securities Dealers (NASD) Rule 3370 requires brokers to guarantee delivery of borrowed shares before allowing customers to sell short, and few brokerage firms or institutional investors will lend IPO shares to short sellers. The Securities and Exchange Commission (SEC) also bars firms in the underwriting syndicate from lending allocated shares until 30 days after the IPO. Therefore, initial aftermarket IPO prices may not reflect the sentiment of the most pessimistic investors.

Arbitrage is a basic tenet of efficient markets theory, but short sale constraints prevent arbitrageurs from transacting in IPOs with prices believed to exceed fundamental value. Even as these restrictions ease, many pessimistic investors remain reluctant to short the stock. Since short selling is a risky transaction that requires a large capital commitment, Shleifer and Vishny (1997) propose that arbitrage can become ineffective under some circumstances. Prices may not return to fundamental value across a short-term horizon, and investors may be unwilling or unable to hold a long-term short. Therefore, given the potential pressure to liquidate a position at a loss, professional arbitrageurs may avoid extremely volatile arbitrage transactions, allowing possible deviations from fundamental value to persist across a long horizon.

Despite its appeal, we find no IPO studies that directly test the Miller (1977) hypothesis.[3] The difficulty lies in measuring the dispersion of beliefs across all potential investors, so we are unable to empirically distinguish between uncertainty and the divergence of opinion about an offering. Theoretically, uncertainty is the variance of the distribution of future prices or returns. Investors exhibit divergence of opinion about an IPO when they differ in their beliefs about this distribution. A security may face high uncertainty, but low divergence of opinion if investors generally agree on the distribution of the uncertainty. In practice, uncertainty and divergence of opinion are likely to be highly correlated. As Miller notes, "It is implausible to assume that although the future is very uncertain, and forecasts are very difficult to make, that somehow everyone makes identical estimates of the return and risk from every security" (p. 1151). The concept of uncertainty suggests that investors will differ in their forecasts.

This study uses three opening-day proxies for the uncertainty or divergence of opinion about an IPO: the percentage opening bid-ask spread, the time of the first trade, and the flipping ratio. These variables, respectively, describe the uncertainty faced by different IPO participants: market markers, underwriters, and institutional investors. We conjecture that IPOs with a wide initial spread, a late opening trade, and/or a high proportion of institutional flipping will exhibit poor long-run abnormal returns.

Market microstructure theory posits that the quoted bid-ask spread reflects dealers' order processing, adverse selection, and inventory holding costs. Copeland and Galai (1983) and Glosten and Milgrom (1985) model adverse selection as a reward to market makers for the potential risk of trading with informed investors. Amihud and Mendelson (1980) and Ho and Stoll (1981)

[2]The theoretical implication of heterogeneous expectations on asset markets with short sale constraints have also been explored by Lintner (1969), Jarrow (1980), Mayshar (1983), Varian (1985), Diamond and Verrecchia (1987), Allen, Morris, and Postlewaite (1993), and Hong and Stein (1999), among others.

[3]Two recent studies provide empirical support for Miller (1977). Chen, Hong, and Stein (2001) observe that breadth of ownership proxies for the negative information withheld from the market by restricted short selling. They associate lower breadth with tighter short sale constraints, high prices relative to fundamentals, and low expected returns. Scherbina (2001) finds that stocks with high dispersion among analyst earnings forecasts earn lower returns, which are linked to the resolution of uncertainty.

explore the inventory holding cost component as compensation for the risk faced by liquidity suppliers. These theories suggest that market makers widen spreads when faced with the greatest uncertainty such as the initial trades of an IPO. Therefore, the opening bid-ask spread provides an early indication of uncertainty across the initial order flow of an IPO.

The second proxy for IPO uncertainty is the time of first trade. Aggarwal and Conroy (2000) report that few IPOs begin trading when the market opens at 9:30 a.m. The lead underwriter decides when the IPO starts trading, after observing the market open and further gauging demand for the issue. The option to delay trading has greatest value when the uncertainty about an IPO is high. Aggarwal and Conroy (2000) document a relationship between first-day returns and the time that IPOs begin trading. On average, late-opening IPOs experience greater underpricing than early-opening IPOs. We propose that late-opening IPOs are subject to greater investor uncertainty, so we expect their long-run performance will lag early-opening IPOs.

The flipping ratio, defined as the proportion of sell-signed, large-block volume (trades of 10,000 shares or more), is the proxy for the divergence of opinion about an IPO. A high flipping ratio implies institutional selling of initial share allocations to retail investors, other institutional investors, market makers, or the underwriters. We propose that a high flipping ratio implies a wide divergence of opinion. Krigman, Shaw, and Womack (1999), hereafter referred to as KSW, examine the relationship between underwriter mispricing and first-day trading. They observe that cold IPOs with low initial returns experience more opening-day selling pressure or flipping from large investors than hot IPOs with high initial returns. KSW also demonstrate that high flipping IPOs significantly underperform low flipping IPOs over the year after the offering.[4]

Using a sample of 2,025 IPOs during the 1993-1996 period, we document the long-run predictive power of the opening spread, time of first trade, and flipping ratio for up to three years after the offering. IPOs with a wide initial spread, a late opening trade, or a high proportion of institutional flipping exhibit poor long-term returns. For instance, a 10.0% increase in flipping activity lowers the one-year post-offering excess returns of an IPO by 3.0%. Each percentage point increase in the size of the opening spread lowers one-year excess returns by 1.2%. Finally, every hour of opening delay for an IPO is associated with approximately 3.5% lower one-year excess returns.

Michaely and Shaw (1995), Brav and Gompers (1997), and Carter, Dark, and Singh (1998) have linked indicators of issue quality to the after-market performance of IPOs. Thus, a potential concern is that the three proxies merely reflect the underlying quality of the offering. We attempt to mitigate this concern by: 1) controlling for the size of the issue, the presence of venture capital funding, underwriter prestige, and the partial adjustment effect in the cross-sectional regressions and 2) examining the strength of the proxies across subsamples of small and large firms. The results are not driven by the low subsequent returns of small IPOs lacking venture capital support or a prestigious underwriter. The proxies for the divergence of opinion and uncertainty exhibit long-term predictive power even after controlling for IPO quality.

Our work is related to several studies that explore the relationship between underpricing and the uncertainty about an offering. Beatty and Ritter (1986), Miller and Reilly (1987), and Draho (2001) demonstrate that the expected underpricing of an IPO is positively related to

[4]First-day flipping accounts for 45% of cold IPO trading volume and 22% of hot IPO volume. Using actual data obtained from lead underwriters, Aggarwal (2001) finds that flipping accounts for approximately 19% of the first two days' trading volume and 15% of the shares offered in the IPO. Aggarwal also notes that institutional investors flip a greater proportion of allocated shares than retail investors.

the *ex ante* uncertainty about its value. Since uncertainty indicates the potential risk of the offering, greater uncertainty implies greater underpricing.

We provide three contributions to the IPO literature. First, we demonstrate the long-run predictive power of the opening spread and the time of first trade. Second, we suggest the opening spread and time of first trade capture the uncertainty about an IPO, while the flipping ratio proxies for the divergence of opinion between institutional and individual investors. Third, after controlling for IPO quality, we show that uncertainty and a wide divergence of opinion lead to greater long-run underperformance. The results are stronger for large firms than for small firms. The study offers overall empirical support for Miller (1977).

The rest of the paper is organized as follows. Section I describes the IPO database and sample selection methodology. Section II presents summary statistics of the IPO sample. Section III presents the empirical results and analyzes the short and long-term predictive power of opening spread, time of first trade and the flipping ratio. Section IV summarizes the results and concludes the study.

I. Data and Methodology

We draw the IPO sample from two primary sources: Securities Data Company and the Trade and Quote database. The folllowing subsections detail the selection methodology.

A. Initial Public Offering Sample

The sample consists of all initial public offerings reported by Securities Data Company between January 1, 1993, and December 31, 1996. To be included, domestic operating firms must be listed on both the Center for Research in Security Prices (CRSP) tapes and the Trade and Quote (TAQ) database, which began in 1993. American Depository Receipts (ADRs), closed-end funds, unit offerings, and real estate investment trusts (REITs) are excluded. The final sample contains 2,025 IPOs, of which the vast majority (86.8%) initially listed on Nasdaq.

The selection procedure generates a large sample of IPOs that are of importance to institutional as well as individual investors. Since Krigman, Shaw, and Womack (1999) explicitly focus on large IPOs that are important to institutional investors, they eliminate all financial institutions, IPOs with offer prices less than or equal to $8 per share, and firms with initial market values less than or equal to $50 million. Applying the KSW screens reduces the sample to 1,230 firms. The contribution to the literature focuses on the relationship between long-run stock performance and divergence of opinion and uncertainty for large IPOs (KSW sample) and small IPOs (non-KSW sample).

B. TAQ Database

The TAQ database provides intraday quote and transaction information for all New York Stock Exchange (NYSE), American Stock Exchange (Amex), and Nasdaq-listed securities. Opening-day trades and quotes are collected from this database for each IPO. Quotes and trades are occasionally filtered. Trades are omitted if TAQ codes the transaction as an error or correction. We also exclude transactions with non-positive quotes (bid or ask), prices, or trade size.

A simple quote rule determines the sign of each trade. Trades with execution prices higher than the prevailing bid-ask midpoint are classified as buyer-initiated and trades below the midpoint as seller-initiated. Trades executed at the midpoint are unsigned. As suggested by Lee and Ready (1991), the prevailing quote for each trade is the most recent bid and ask that

are at least five seconds old. Ellis, Michaely, and O'Hara (2000a) and Odders-White (2000) test the accuracy of various trade classification rules, and conclude that the quote rule correctly classifies 76.4% and 75.0% of Nasdaq and NYSE transactions, respectively.

We measure the percentage opening spread, time of first trade, and flipping ratio from the opening day of each IPO. The percentage opening spread is computed by dividing the first quoted spread by the bid-ask midpoint. If any trade other than the opening auctions of the NYSE and Amex occurs before the first quoted spread, we assign the spread a missing value. The time of first trade represents the recorded time of the opening trade in hours after 9:30 a.m.

The flipping ratio is calculated by dividing total sell-signed block volume by total share volume. Statistically speaking, the definition of flipping is identical to that in KSW (Pearson correlation coefficient of 0.9995), which defines flipping as the ratio of sell-signed block-trade dollar volume to total dollar volume traded. Block trades are defined as trades of 10,000 shares or more. The opening-auction trades of NYSE and Amex firms are not counted as block trades regardless of size.

II. Summary Statistics

Table I reports summary statistics for the IPO sample by cohort year. The average IPO increases 15.7% from the offer price to the closing price on the first day. This gain is consistent with the average first-day return of 15.8% reported by Ritter (1998) for the 1960-1996 period. The flipping ratio measures the trading volume generated by large institutional shareholders dumping their share allocation on the opening day. The average flipping ratio is relatively constant throughout the four-year period, suggesting that institutional selling generates almost 30% of first-day trading volume. The average time of the first reported trade moves up slightly over the four years of the sample, with an average delay of approximately one and one-half hours.

Long-term returns for each IPO begin 20 trading days after the initial CRSP listing date and end on the delisting date or anniversary date (one-year and three-year), whichever comes first. Across the sample, 21.2% or 429 firms delist prior to the three-year anniversary date. Three-year aftermarket returns are consistent with the practice in other long-term performance studies such as Ritter (1991), Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), and Carter, Dark, and Singh (1998), among others.

The justification for commencing the buy-and-hold returns 20 days after the IPO relies on the evidence provided by the IPO stabilization literature. Numerous studies document underwriter price stabilization within the first 20 trading days after the offering.[5] Therefore, calculating from 20 days onward avoids any bias in returns caused by the post-offering price stabilization activities of the underwriting syndicate. The one-month, six-month, and one-year returns of KSW begin on the third trading day after the offering.

Table I also compares the average returns of the sample against the CRSP value-weighted NYSE-Amex-Nasdaq index. The IPOs lag this benchmark by 42.7% over the three-year post-offering period. We report poor IPO performance across each cohort year. The three-year wealth relative of 0.76 for the overall sample compares to 0.83 reported by Ritter (1991). The performance of the 1995 and 1996 cohorts is especially poor. For example, the raw three-year buy-and-hold return of the 1996 cohort sample is only 17.0%, in contrast to the market index return of 82.9% over the same time period.

Table II provides average summary statistics of the sample across eight potential proxies

[5]Refer to Hanley, Kumar, and Seguin (1993), Schultz and Zaman (1994), Asquith, Jones, and Kieschnick (1998), and Aggarwal (2000).

Table I. Summary Statistics of IPO Sample by Cohort Year

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. The first-day return is from the offer price to the first-day closing price. The flipping ratio is measured by dividing the ratio of sell-signed block volume by total share volume from the first day of trading. The time of first trade represents the average time of the first reported trade. Three-year returns are measured for each IPO firm and the corresponding CRSP value-weighted NYSE-Amex-Nasdaq index. All returns start 20 trading days after the initial CRSP listing date and end on the delisting date or anniversary date (whichever comes first). The wealth relative is calculated as in Ritter (1991) by dividing one plus the holding-period IPO return by one plus the return on the value-weighted (VW) index.

					3-Year Returns		
Cohort Year	No. of IPOs	First-Day Return (%)	Flipping Ratio (%)	Time of 1st Trade	IPO Sample (%)	VW Index (%)	Wealth Relative
1993	513	12.4	29.3	10:45 am	38.7	53.8	0.90
1994	408	11.0	30.0	10:52 am	70.9	87.0	0.91
1995	449	20.6	28.9	11:03 am	22.6	87.1	0.66
1996	655	17.7	31.1	11:09 am	17.0	82.9	0.64
Total	2,025	15.7	29.9	10:58 am	34.6	77.3	0.76

for the quality, uncertainty, and divergence of opinion about an IPO: first-day returns, opening bid-ask spread, time of first trade, flipping ratio, offer price, market value, venture capital (VC) backing, and underwriter prestige. In unreported results, the interpretations remain identical across median values of each category.

The panels categorize the sample by KSW selection criteria (Panel A), flipping ratio (Panel B), percentage opening spread (Panel C), time of first trade (Panel D), and market value (Panel E). Market value is defined as the first-day closing stock price multiplied by the CRSP-listed shares outstanding. The underwriter prestige dummy variable equals one if the lead manager of the IPO has a Carter and Manaster (1990) rank greater than or equal to 8 (and zero otherwise), as determined by Carter, Dark, and Singh (1998). For co-managed IPOs, the variable equals one if any of the lead managers has a Carter and Manaster (CM) rank greater than or equal to 8. In general, we associate high-quality IPOs with narrower opening spreads, less flipping activity, higher offer prices, greater market values, more VC backing, and high underwriter quality.

Panel A of Table II supports the KSW focus on large IPOs of interest to institutional investors. On average, the KSW IPOs have narrower opening spreads, higher offer prices, greater market values, greater VC backing, and more prestigious underwriters than non-KSW IPOs. Prestigious investment banks underwrote almost 71% of KSW IPOs, but less than 23% of non-KSW IPOs. Interestingly, we also find similar levels of institutional flipping activity across large (KSW) and small (non-KSW) IPOs.

Panel B of Table II classifies the sample into low, middle, and high flipping ratio groups. Consistent with KSW, we find an inverse relationship between flipping activity and first-day returns. Low flipping IPOs (row 4) average a 20.1% first-day return, while high flipping IPOs experience an 8.6% return. We do not find a strong relationship between flipping activity and the opening spread, time of first trade, offer price, market value, proportion of VC backing, or underwriter prestige. This result suggests that initial flipping activity is driven more by underpricing than by issue quality.

Table II. Mean Summary Statistics of Sample Categorized by Flipping Ratio, Opening Spread, Time of First Trade, and Market Value

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. The Krigman, Shaw, and Womack (KSW, 1999) sample includes non-financial institution IPOs with offer prices above $8 per share and a market value greater than $50 million. The first-day return is from the offer price to the first-day closing price. The flipping ratio is the ratio of first-day, sell-signed block volume divided by total share volume. The opening spread represents the first quoted spread from the TAQ database divided by the bid-ask midpoint. The time of first trade represents the average time of the first reported trade. Market value (in millions) is calculated by multiplying the first CRSP-listed price by the number of shares outstanding. VC backed indicates the proportion of IPO firms backed with venture capital. Prestigious underwriter is the proportion of IPOs underwritten by strong-reputation underwriters. The unequal number of firms in the opening spread groups is caused by several IPOs with identical spreads at the cutoff point.

Sample Group	No. of IPOs	First-Day Return (%)	Opening Spread (%)	Time of 1st Trade	Flipping Ratio (%)	Offer Price	Market Value	VC Backed (%)	Prestigious Underwriter (%)
Panel A: KSW and Non-KSW Groups									
1. KSW Firms	1,230	16.8	4.6	10:42 am	30.9	$14.0	$274.0	48.4	70.7
2. Non-KSW Firms	795	13.9	9.1	11:24 am	28.4	$8.4	$106.4	26.0	22.5
3. All Firms	2,025	15.7	6.4	10:58 am	29.9	$11.8	$208.2	39.6	51.8
Panel B: Flipping Ratio Groups									
4. Low	675	20.1	7.2	11:02 am	12.3	$11.6	$209.1	31.3	45.6
5. Middle	675	18.2	5.6	11:01 am	27.2	$12.5	$228.0	45.2	59.7
6. High	675	8.6	6.3	10:53 am	50.4	$11.3	$187.6	42.3	49.9
Panel C: Opening Spread Groups									
7. Low	674	19.8	2.1	10:49 am	30.5	$14.1	$272.3	44.4	71.1
8. Middle	689	12.5	5.3	10:45 am	30.8	$12.0	$147.5	43.7	50.9
9. High	662	14.8	11.8	11:22 am	28.5	$9.2	$206.3	30.5	32.9
Panel D: Time of First Trade Groups									
10. Early	674	11.6	5.7	9:53 am	30.8	$13.2	$270.1	32.5	56.5
11. Middle	676	13.5	5.8	10:33 am	30.3	$12.1	$222.4	45.6	58.0
12. Late	675	21.8	7.6	12:29 pm	28.7	$10.1	$132.3	40.7	40.7
Panel E: Market Value Groups									
13. Small	675	13.2	9.5	11:30 am	28.2	$7.5	$33.0	25.3	13.8
14. Medium	675	10.7	5.0	10:44 am	31.6	$11.8	$95.4	48.0	59.2
15. Large	675	23.1	4.5	10:41 am	30.0	$16.1	$496.2	45.5	82.2

Panel C of Table II categorizes the sample by the opening bid-ask spread. High opening spread IPOs (row 9) generally open later, have lower offer prices, and are less likely to use venture capital than low spread IPOs (row 7). We also report a strong association between opening spread and underwriter prestige. Over 71% of IPOs with low opening spreads used a prestigious underwriter, compared to only 32.9% of high opening spread IPOs. The initial spread appears unrelated to the level of flipping activity.

Aggarwal and Conroy (2000) document that late-opening IPOs generally experience higher first-day returns. They also report that small IPOs are more likely to open later in the trading day. The evidence presented in Panel D of Table II supports these conclusions. On average, late-opening IPOs report higher first-day returns, lower offer prices, and lower market values than early-opening IPOs. We find no significant link between flipping activity and the time an IPO opens for trading, although late-opening IPOs are less likely to use a prestigious underwriter.

Ellis, Michaely, and O'Hara (2000b) explore the relationship between the lead underwriter of an IPO and the primary market maker. Underwriters can use this relationship to influence the time and price at which an IPO begins trading. Aggarwal and Conroy (2000) suggest that underwriters also have preferred times to open trading in an IPO. The option to delay the open provides additional time and flexibility to determine the market-clearing price. Therefore, we expect that IPOs facing the greatest level of uncertainty will open later in the trading day.

The last panel of Table II divides the IPO sample by market value. Small IPOs (row 13) have lower initial returns, wider opening spreads, later first trades, and lower offer prices than large IPOs. Flipping activity appears unrelated to size. Not surprisingly, prestigious investment banks underwrote more than 82% of the large-capitalization IPOs, but less than 14% of the smaller issues.

To further explore the interaction among the primary empirical proxies, Table III presents the correlation coefficients between the flipping ratio, opening spread, time of first trade, market value, and first-day returns. The positive relationship between the opening spread and time of first trade (correlation of 0.26) supports the notion that both variables proxy for the initial uncertainty about the IPO. When faced with high uncertainty about an offering, underwriters are likely to delay the opening, and market makers will generally post wider spreads. The flipping ratio exhibits relatively little correlation with the size of the opening spread, time of first trade, or market value. Like KSW, we also find a negative relation between flipping activity and first-day returns.

III. Empirical Results

Our analysis focuses on the short and long-term predictive power of the flipping ratio, opening spread, and time of first trade. Section A explores the relationship between these empirical proxies and first-day returns, while Section B explores their explanatory power over one and three-year aftermarket returns.

A. First-Day Returns

Faced with great uncertainty about an IPO, potential investors are likely to diverge in their estimates of aftermarket value. Miller (1977) proposes that a wide divergence of opinion among IPO investors can lead to short-run overvaluation and long-run underperformance. The cross-sectional regressions in Table IV examine the interaction between first-day returns and early market proxies for divergence of opinion, uncertainty, and IPO quality. The dependent variable is the percentage first-day return from the offer price to the closing

Table III. Pearson Correlation Coefficients of the Flipping Ratio, Opening Spread, Time of First Trade, Market Value, and First-Day Returns

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. The first-day return is from the offer price to the first-day closing price. The flipping ratio is the ratio of first-day, sell-signed block volume divided by total share volume. The opening spread represents the first quoted spread from the TAQ database divided by the bid-ask midpoint. Time of first trade is measured in hours after 9:30 a.m. Market value (in millions) is calculated by multiplying the first CRSP-listed price by the number of shares outstanding.

Variable	Flipping Ratio	Opening Spread	Time of First Trade	Market Value	First-Day Return
Flipping Ratio	1.00	-0.08	-0.06	0.01	-0.19
Opening Spread		1.00	0.26	0.01	0.03
Time of First Trade			1.00	-0.09	0.14
Market Value				1.00	0.06
First-Day Return					1.00

price.[6] The independent variables are the flipping ratio, opening spread, time of first trade, offer price, VC dummy, prestige dummy, and a filing range (FR) dummy. The VC dummy equals one for IPOs backed by venture capital. The prestige dummy equals one if the lead underwriter of the IPO has a Carter and Manaster (1990) rank of 8 or higher, as determined by Carter, Dark, and Singh (1998). The FR dummy variable, designed to capture the partial adjustment effect identified by Hanley (1993), equals one for IPOs priced above the initial offer price range.

The first row of Table IV reports the regression results for the entire sample. We find that IPOs with low flipping activity or late opening trades are associated with higher first-day returns. In addition, the significantly positive coefficient on the FR dummy supports Hanley's (1993) partial adjustment effect: IPOs priced above their initial filing range generally experience high first-day returns. We find no significant relationship between first-day returns and the degree of the opening spread, or with traditional measures of IPO quality such as offer price, VC backing, or underwriter prestige.[7] The low explanatory power of the prestige dummy

[6]We acknowledge that the dependent variable (first-day returns) and the flipping ratio are simultaneously determined in this specification. As a potential solution, we explored the instrumental variables or two-stage regression technique, where the first stage estimates the flipping ratio as a function of predetermined variables. The second stage regression then uses the predicted level of flipping along with the remaining instrumental variables. Unfortunately, aside from first-day or initial return, the literature provides little help to determine the relevant predictors of aftermarket flipping activity. For example, KSW model flipping as a function of underwriter prestige, size, and initial return, but the predictive power derives mainly from initial return. Aggarwal (2001) finds that first-day return and underwriter type are the most important predictors of institutional flipping. Although we test several combinations of instruments to estimate flipping activity, none are able to provide significant explanatory power. In addition, Hausman tests of these systems fail to suggest that the base OLS model estimated in Table IV is an inconsistent estimator of initial returns.

[7]In unreported results, including a dummy variable in Table IV for each of the 23 different investment banks underwriting at least 20 IPOs during the sample period does not substantially alter the significance levels or interpretation of the regression coefficients. For example, the time of first trade coefficient barely changes from 1.90 (t-statistic of 3.06) in row 1 of Table IV to 1.74 (t-statistic of 2.59) even though these dummy variables control for time preferences across underwriters.

Table IV. Cross-Sectional Regressions of Early Market Indicators of Uncertainty and IPO Quality on First-Day Returns

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. Percentage first-day return is computed from the offer price to the closing price and is the dependent variable. Flipping ratio is the fraction of first-day, sell-signed block volume divided by total share volume. Percentage opening spread is the first quoted spread from the TAQ database divided by the bid-ask midpoint. Time of first trade is measured in hours after 9:30 a.m. The venture capital (VC) dummy equals one (or zero otherwise) if the firm is a VC-backed IPO. The prestige dummy equals one (or zero otherwise) if the IPO's lead underwriters have a strong reputation. The filing range (FR) dummy equals one if the IPO is priced above the high end of its initial offer price range. The Krigman, Shaw, and Womack (KSW, 1999) sample includes non-financial institution IPOs with offer prices above $8 per share and a market value greater than $50 million. The t-statistics (in parentheses) are calculated using White's (1980) heteroskedasticity-consistent method.

$$\text{First-Day Return}_i = a_0 + a_1 \text{Flipping Ratio}_i + a_2 \text{Opening Spread}_i + a_3 \text{Time of First Trade}_i + a_4 \text{Offer Price}_i + a_5 \text{VC Dummy}_i + a_6 \text{Prestige Dummy}_i + a_7 \text{FR Dummy}_i + e_i$$

Model	Intercept	Flipping Ratio	Opening Spread	Time of 1st Trade	Offer Price	VC Dummy	Prestige Dummy	FR Dummy	Adj. R^2
1. All Firms (N = 2,025)	16.21	-0.21	0.08	1.90	-0.18	-0.24	-0.37	21.23	
	(3.27)	(-6.68)	(0.43)	(3.06)	(-0.78)	(-0.22)	(-0.33)	(14.31)	0.15
2. KSW cutoffs (N = 1,230)	8.56	-0.29	-0.26	4.17	0.51	2.04	-1.32	19.19	
	(2.97)	(-11.79)	(-1.34)	(5.73)	(2.94)	(2.13)	(-1.25)	(13.68)	0.39
3. Non-KSW cutoffs (N = 795)	23.80	-0.10	0.33	-0.31	-1.01	-8.86	0.71	13.55	
	(2.75)	(-1.63)	(0.99)	(-0.33)	(-2.40)	(-3.50)	(0.28)	(4.04)	0.05

stands in contrast to Carter, Dark, and Singh (1998), who document a significantly negative relationship between first-day returns and underwriter prestige across a sample of IPOs from 1979-1991.[8]

Categorizing the sample into large IPOs (KSW, row 2) and small IPOs (non-KSW, row 3) changes the interpretation of the regression coefficients in Table IV. For example, the flipping ratio is a highly significant predictor of first-day returns for large firms but statistically insignificant for small firms. This result is actually not surprising because institutions are less likely to invest in small IPOs. Time of first trade is another strong indicator of first-day returns for large firms, but again, less significant for small firms. This lack of explanatory power across the non-KSW sample may result from a tendency for small IPOs to open later in the trading day. Finally, the offer price and VC dummy coefficients are both positively associated with first-day returns of large IPOs but negatively related to the first-day returns of small IPOs.

B. One-Year and Three-Year Market-Adjusted Returns

As a further test of the Miller (1977) hypothesis, we explore whether proxies for divergence of opinion and uncertainty can forecast long-term IPO returns. Table V reports the cross-sectional regressions of early market proxies for divergence of opinion, uncertainty, and IPO quality on long-term one-year (Panel A) and three-year (Panel B) market-adjusted returns. The regressions also control for previously documented predictors of long-term returns identified by the asset pricing literature, market value and the book-to-market ratio. Each panel provides the regression results across the full sample and for KSW and non-KSW IPOs.

According to the full sample regression in Row 1 of Table V, the flipping ratio, opening spread, time of first trade, and first-day return all have statistically significant explanatory power for one-year excess returns. The time of first trade coefficient associates each hour of opening delay with a 3.5% lower one-year excess return. Likewise, a one percent increase in the opening spread translates to 1.2% lower excess returns. The coefficients on measures of IPO quality such as offer price, VC backing, or underwriter prestige are insignificant. The low significance of the FR dummy coefficient suggests that the partial-adjustment effect documented by Hanley (1993) is primarily a short-term phenomenon. This result supports Logue, Rogalski, Seward, and Foster-Johnson (2001), who report that pre-market underwriting activities, such as partial adjustment, are significant determinants of initial after-market returns but unrelated to long-run returns. Meanwhile, the lack of explanatory power exhibited by market value or the book-to-market ratio is at variance with Brav and Gompers (1997), who find that these variables predict returns for up to five years after the offering.

Rows 2 and 3 of Table V reveal that the one-year explanatory power of flipping, opening spread, and time of first trade changes across KSW (large) and non-KSW (small) IPOs. The flipping ratio and time of first trade both have greater predictive ability for large firms, while the size of the opening spread provides stronger information for small firms. For example, the time of first trade coefficient is highly significant for the KSW sample but insignificant for the non-KSW sample. The coefficient on the opening spread is marginally significant for large firms and highly significant for small firms.

[8]During the 1993-1996 period, IPOs underwritten by investment banks with a Carter and Manaster (CM) rank of 8 or higher average first-day returns of 16.3% compared to 15.0% for IPOs from non-prestigious banks. Issues by Morgan Stanley (CM rank of 8.9) and Goldman Sachs (CM rank of 9.0) report the highest average first-day returns of any prestigious underwriter during the time period, 25.8% and 23.8%, respectively. During the 1979-1991 period, IPOs underwritten by Morgan Stanley and Goldman Sachs report average first-day returns of only 7.9% and 6.5%, respectively.

Table V. Cross-Sectional Regressions of Early Market Indicators of Uncertainty and IPO Quality on One-Year and Three-Year Market-Adjusted Returns

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. Percentage market-adjusted returns subtract the return on the value-weighted NYSE-Amex-Nasdaq index from the corresponding raw return. Returns begin 20 trading days after the initial CRSP listing and end on either the delisting date or anniversary (one and three year) date. Flipping ratio is the fraction of first-day, sell-signed block volume divided by total share volume. Percentage opening spread is the first, quoted spread from the TAQ database divided by the bid-ask midpoint. Time of first trade is measured in hours after 9:30 a.m. First-day return is computed from the offer price to the closing price. The ln(MV) represents the natural log of market value as of the first CRSP-listed price. The ln(B/M) is the natural log of the post-offering book-to-market ratio. For firms with negative book values, the book-to-market ratio is set equal to 0.01. Outliers are winsorized at the 1 and 99 percent levels. The venture capital (VC) dummy equals one (or zero otherwise) if the firm is a VC-backed IPO. The prestige dummy equals one (or zero otherwise) if the IPO's lead underwriters have a high reputation. The filing range (FR) dummy equals one if the IPO was priced above the high end of its initial offer price range. The Krigman, Shaw, and Womack (KSW, 1999) sample includes non-financial institution IPOs with offer prices above $8 per share and a market value greater than $50 million. The *t*-statistics (in parentheses) are calculated using White's (1980) heteroskedasticity-consistent method.

$$r_i - r_m = a_0 + a_1 \text{Flipping Ratio}_i + a_2 \text{Opening Spread}_i + a_3 \text{Time of First Trade}_i + a_4 \text{First-Day Return}_i + a_5 \ln(MV)_i + a_6 \ln(B/M)_i + a_7 \text{Offer Price}_i + a_8 \text{VC Dummy}_i + a_9 \text{Prestige Dummy}_i + a_{10} \text{FR Dummy}_i + e_i$$

Model	Intercept	Flipping Ratio	Opening Spread	Time of 1st Trade	1st Day Return	ln(MV)	ln(B/M)	Offer Price	VC Dummy	Prestige Dummy	FR Dummy	Adj. R^2
Panel A: One-Year Market Adjusted Returns												
1. All Firms (N = 2,025)	16.74	-0.30	-1.18	-3.51	-0.20	-1.63	-2.26	0.12	-1.66	6.85	-2.06	0.02
	(1.88)	(-3.70)	(-3.60)	(-2.23)	(-3.18)	(-0.68)	(-1.15)	(0.20)	(-0.50)	(1.86)	(-0.46)	
2. KSW Firms (N = 1,230)	31.35	-0.37	-1.03	-4.59	-0.23	-6.13	-2.54	0.72	-3.03	8.32	0.73	0.02
	(2.40)	(-3.47)	(-1.97)	(-2.17)	(-2.05)	(-2.01)	(-1.17)	(1.00)	(-0.76)	(1.96)	(0.13)	
3.Non-KSW (N = 795)	-13.13	-0.25	-1.45	-1.94	-0.18	7.70	-2.84	-0.57	1.92	4.87	-6.23	0.03
	(-1.01)	(-1.90)	(-3.06)	(-0.87)	(-2.72)	(1.71)	(-0.77)	(-0.60)	(0.31)	(0.66)	(-0.73)	
Panel B: Three-Year Market Adjusted Returns												
4. All Firms (N = 2,025)	-8.69	-0.77	-0.52	-10.67	-0.41	-4.12	-3.75	1.67	9.43	13.34	-11.21	0.02
	(-0.30)	(-3.09)	(-0.60)	(-3.43)	(-2.86)	(-0.75)	(-0.92)	(1.22)	(1.18)	(1.48)	(-1.16)	
5. KSW Firms (N = 1,230)	-29.02	-0.71	-0.17	-12.61	-0.44	-4.83	-8.12	2.05	15.54	17.80	-4.92	0.02
	(-0.84)	(-2.75)	(-0.10)	(-2.73)	(-1.84)	(-0.67)	(-1.59)	(1.19)	(1.63)	(1.81)	(-0.41)	
6. Non-KSW (N = 795)	-20.59	-0.74	-1.14	-9.28	-0.44	5.35	1.64	1.39	-0.58	7.21	-37.09	0.02
	(-0.54)	(-1.86)	(-1.04)	(-2.06)	(-2.37)	(0.52)	(0.24)	(0.64)	(-0.04)	(0.37)	(-2.38)	

We can provide an explanation for the discrepancies between the regression coefficients across the KSW and non-KSW groups of Panel A. First, the flipping ratio is defined as a proxy for institutional selling pressure. Since the non-KSW sample is defined as including firms of limited interest to institutional investors, the flipping variable may not provide the same predictive power as for IPOs with strong institutional support. Second, low-priced stocks generally have higher percentage spreads. Since we find a greater dispersion of opening spreads within the non-KSW sample, the opening spread may provide a more informative signal for small firms. Third, as we have noted, small firms tend to open later in the trading day. This clustering reduces the significance of the time of first trade coefficient across the non-KSW sample.

Panel B of Table V reports the cross-sectional regressions for three-year market-adjusted returns. The flipping ratio, time of first trade, and first-day returns continue to provide statistically significant explanatory power of returns for up to three years after the IPO. The full sample (row 4) coefficient on time of first trade associates each hour of opening delay with approximately 10.7% lower returns.[9] Every ten percent increase in the proportion of institutional flipping signals 7.7% lower three-year returns. Including measures of IPO quality such as offer price, VC backing, and underwriter prestige does not eliminate the explanatory power of these variables. We find little support for the Brav and Gompers (1997) assertions that market value and the book-to-market ratio explain long-term IPO returns.

Unlike the one-year cross-sectional regressions, categorizing the sample into large IPOs (KSW) and small IPOs (non-KSW) in Panel B does not substantially alter the interpretation of the flipping or time of first trade coefficients. Time of first trade is now a significant long-term explanatory variable for both large and small IPOs. The significance of the flipping ratio declines, but its coefficient actually increases across the non-KSW IPOs. The marginal significance of the opening spread coefficient, however, suggests that its predictive power does not extend beyond one year.

To summarize, the opening spread, time of first trade, and flipping ratio have significant long-run predictive power for returns up to three years after the IPO. Accounting for indicators of issue quality such as offer price, market value, venture capital funding, and underwriter prestige does not reduce the strength of these variables. This evidence supports Miller's (1977) theory that greater divergence of opinion or uncertainty about an IPO leads to long-term underperformance.

The low correlation among the opening spread, time of trade, and flipping ratio suggests that each variable provides unique information about the initial uncertainty and/or difference of opinion about an IPO. Thus, we may improve our ability to identify the best-performing IPOs by screening on two or more variables.

Table VI reports median three-year market-adjusted returns for a paired categorization of the full sample into flipping ratio, opening spread, and time of first trade portfolios. Mean returns and the number of observations are in brackets. For each row, z-statistics gauge the statistical difference across the distribution of low-high and early-late portfolio returns. We do not observe substantial clustering within any one portfolio.

The median and mean IPO returns for the sample significantly lag the market over the three-year post-offering period. The evidence from Table VI indicates that portfolios of IPOs with low flipping ratios, narrow opening spreads, and early first trades provide the best performance. For example, the low opening spread and early first trade portfolio in Panel C generates a median (mean) three-year excess return of -59.0% (-24.8%) compared to a median (mean) return of -118.5% (-72.2%) for the high opening spread and late first trade portfolio. The benefits of conditioning

[9]A cross-sectional regression with three-year excess returns as the dependent variable and time of first trade as the independent variable yields a coefficient of -0.14 (t-statistic of -4.90). The time of first trade coefficient is again relatively unaffected at -0.14 (t-statistic of -4.46) by including a dummy variable for each of the 23 investment banks underwriting at least 20 IPOs from 1993-1996.

Table VI. Median and Mean Three-Year Market-Adjusted Returns of Portfolios Categorized by Flipping Ratio, Opening Spread, and Time of First Trade for All IPOs

The sample includes 2,025 US operating firms with an IPO between 1993 and 1996 as reported by Securities Data Company. Percentage market-adjusted returns are measured by subtracting the return on the value-weighted NYSE-Amex-Nasdaq index from the corresponding raw return. Returns begin 20 trading days after the initial CRSP listing and end on either the delisting date or three-year anniversary. Mean portfolio returns and the number of observations are in brackets. Portfolios are formed by independently assigning each IPO to a flipping, opening spread, and time of first trade group. The flipping ratio is the ratio of first-day, sell-signed block volume divided by total share volume. The opening spread represents the first quoted spread from the TAQ database divided by the bid-ask midpoint. The time of first trade represents the average time of the first reported trade. The Z-statistics test the difference between the distribution of returns across the low-high and early-late portfolios.

Panel A: Flipping and Opening Spread Portfolios

	Opening Spread			Low–High
	Low	**Middle**	**High**	**Z-Statistic**
Low Flipping	-75.2%	-87.0%	-94.0%	
	[-9.4%, 189]	[-26.5%, 212]	[-44.7%, 274]	1.84
Middle Flipping	-90.2%	-83.1%	-93.8%	
	[-50.1%, 275]	[-29.6%, 230]	[-43.3%, 170]	0.45
High Flipping	-74.1%	-89.6%	-101.9%	
	[-49.3%, 210]	[-56.0%, 247]	[-67.3%, 218]	1.52

Panel B: Flipping and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	**Middle**	**Late**	**Z-Statistic**
Low Flipping	-66.9%	-72.1%	-115.8%	
	[-29.2%, 243]	[2.5%, 210]	[-58.9%, 222]	4.33
Middle Flipping	-61.8%	-83.5%	-110.5%	
	[-11.2%, 174]	[-46.4%, 251]	[-57.4%, 250]	4.43
High Flipping	-70.1%	-97.4%	-119.5%	
	[-38.1%, 257]	[-65.9%, 215]	[-73.2%, 203]	4.43

Panel C: Opening Spread and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	**Middle**	**Late**	**Z-Statistic**
Low Spread	-59.0%	-88.7%	-101.7%	
	[-24.8%, 241]	[-44.9%, 199]	[-47.0%, 234]	3.92
Middle Spread	-67.3%	-81.6%	-120.6%	
	[-23.4%, 243]	[-32.4%, 279]	[-68.9%, 167]	4.51
High Spread	-71.2%	-81.8%	-118.5%	
	[-37.8%, 190]	[-37.0%, 198]	[-72.2%, 274]	4.16

upon this information are not limited to the extreme portfolios. Late opening IPOs significantly underperform early opening IPOs across each flipping group and each opening spread group.

Table VII reports median and mean (in brackets) three-year excess returns for the paired categorizations of KSW IPOs. Since the opening spread has less predictive power among large firms, it provides limited incremental contribution beyond the flipping ratio in Panel A. The time of first trade categorization, however, provides a substantial contribution to the flipping and

Table VII. Median and Mean Three-Year Market-Adjusted Returns of Portfolios Categorized by Flipping Ratio, Opening Spread, and Time of First Trade for KSW Sample Characteristic IPOs

The sample includes 1,230 non-financial institution US operating firms with an IPO between 1993 and 1996 with an offer price above $8 per share and a market value greater than $50 million. Percentage market-adjusted returns are measured by subtracting the return on the value-weighted NYSE-Amex-Nasdaq index from the corresponding raw return. Returns begin 20 trading days after the initial CRSP listing and end on either the delisting date or three-year anniversary. Mean portfolio returns and the number of observations are in brackets. Portfolios are formed by independently assigning each IPO to a flipping, opening spread, and time of first trade group. The flipping ratio is the ratio of first-day, sell-signed block volume divided by total share volume. The opening spread represents the first quoted spread from the TAQ database divided by the bid-ask midpoint. The time of first trade represents the average time of the first reported trade. The Z-statistics test the difference between the distribution of returns across the low-high and early-late portfolios.

Panel A: Flipping and Opening Spread Portfolios

	Opening Spread			Low–High
	Low	Middle	High	Z-Statistic
Low Flipping	-66.1%	-69.5%	-66.8%	
	[-5.7%, 143]	[-35.1%, 126]	[-26.6%, 80]	-0.16
Middle Flipping	-93.1%	-81.7%	-89.4%	
	[-53.00, 240]	[-20.0%, 180]	[-47.8%, 60]	0.12
High Flipping	-74.0%	-85.0%	-97.9%	
	[-52.4%, 169]	[-50.6%, 162]	[-70.3%, 70]	1.08

Panel B: Flipping and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	Middle	Late	Z-Statistic
Low Flipping	-58.3%	-79.1%	-70.6%	
	[-16.2%, 150]	[-37.0%, 137]	[2.1%, 62]	1.09
Middle Flipping	-66.5%	-80.5%	-111.5%	
	[-3.8%, 124]	[-50.2%, 186]	[-55.2%, 170]	3.51
High Flipping	-62.0%	-103.1%	-118.0%	
	[-28.6%, 183]	[-76.9%, 134]	[-76.6%, 84]	3.65

Panel C: Opening Spread and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	Middle	Late	Z-Statistic
Low Spread	-60.3%	-89.5%	-101.1%	
	[-24.0%, 201]	[-58.4%, 162]	[-42.9%, 189]	3.22
Middle Spread	-59.7%	-89.3%	-111.8%	
	[-1.96%, 168]	[-52.3%, 204]	[-54.4%, 96]	3.62
High Spread	-66.8%	-80.7%	-127.5%	
	[-33.8%, 88]	[-50.4%, 91]	[-76.0%, 31]	2.89

opening spread groups of Panels B and C. For instance, the low flipping and early first trade portfolio generates a median (mean) excess return of -58.3% (-16.2%), while the high flipping and late first trade portfolio experiences a median (mean) excess return of -118.0% (-76.6%), a difference of almost 60 percent.

Finally, Table VIII reports median and mean (in brackets) three-year market-adjusted returns for the paired categorization of non-KSW IPOs. The pairwise sort continues to disclose

Table VIII. Median and Mean Three-Year Market-Adjusted Returns of Portfolios Categorized by Flipping Ratio, Opening Spread, and Time of First Trade for Non-KSW Sample Characteristic IPOs

The sample includes 795 US operating firms with an IPO between 1993 and 1996 with an offer price less than $8 per share and/or a market value less than $50 million. Percentage market-adjusted returns are measured by subtracting the return on the value-weighted NYSE-Amex-Nasdaq index from the corresponding raw return. Returns begin 20 trading days after the initial CRSP listing and end on either the delisting date or three-year anniversary. Mean portfolio returns and the number of observations are in brackets. Portfolios are formed by independently assigning each IPO to a flipping, opening spread, and time of first trade group. The flipping ratio is the ratio of first-day, sell-signed block volume divided by total share volume. The opening spread represents the first quoted spread from the TAQ database divided by the bid-ask midpoint. The time of first trade represents the average time of the first reported trade. The Z-statistics test the difference between the distribution of returns across the low-high and early-late portfolios.

Panel A: Flipping and Opening Spread Portfolios

	Opening Spread			Low–High
	Low	**Middle**	**High**	**Z-Statistic**
Low Flipping	-89.1%	-98.2%	-109.9%	0.69
	[-21.0%, 46]	[-14.0%, 86]	[-52.2%, 194]	
Middle Flipping	-70.7%	-86.2%	-95.3%	0.98
	[-30.3%, 35]	[-63.9%, 50]	[-40.9%, 110]	
High Flipping	-82.0%	-103.9%	-102.0%	0.64
	[-36.4%, 41]	[-66.2%, 85]	[-65.9%, 148]	

Panel B: Flipping and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	**Middle**	**Late**	**Z-Statistic**
Low Flipping	-85.2%	-61.3%	-124.1%	2.67
	[-50.3%, 93]	[76.7%, 73]	[-82.6%, 160]	
Middle Flipping	-37.7%	-87.4%	-109.1%	2.57
	[-29.3%, 50]	[-35.7%, 65]	[-62.1%, 80]	
High Flipping	-87.4%	-79.1%	-121.3%	1.53
	[-61.8%, 74]	[-47.7%, 81]	[-70.9%, 119]	

Panel C: Opening Spread and Time of First Trade Portfolios

	Time of First Trade			Early–Late
	Early	**Middle**	**Late**	**Z-Statistic**
Low Spread	-50.5%	-82.0%	-107.3%	2.35
	[-28.6%, 40]	[13.9%, 37]	[-64.1%, 45]	
Middle Spread	-89.2%	-55.3%	-129.2%	2.07
	[-71.6%, 75]	[21.9%, 75]	[-88.7%, 71]	
High Spread	-82.1%	-86.7%	-116.9%	2.56
	[-41.2%, 102]	[-25.6%, 107]	[-71.7%, 243]	

additional benefits despite the smaller sample size. Across the flipping groups of Panel A, the excess returns of the wide opening spread portfolio exceed the narrow opening spread portfolio. Late opening IPOs significantly lag early opening IPOs across the flipping and opening spread groups of Panels B and C.

IV. Summary and Conclusion

Using a sample of 2,025 IPOs during the 1993-1996 period, we examine the long-term predictive power of early market indicators of divergence of opinion, uncertainty, and IPO quality. We illustrate that IPOs with a high proportion of flipping activity, wide opening spreads, or long opening delays significantly lag the market for up to three years after the offering. Categorizing the sample by the KSW selection criteria reveals that flipping and time of first trade are more informative measures of long-term performance for large firms, while the opening spread is a stronger indicator for small firms. The results are robust to indicators of IPO quality such as market capitalization, offer price, venture capital financing, underwriter prestige, and partial adjustment.

We contend that the flipping ratio, opening spread, and time of first trade each captures a unique component of the uncertainty or divergence of opinion about an IPO. The flipping ratio, as measured by Krigman, Shaw, and Womack (1999), gauges the proportion of opening day trading volume generated by institutional selling. The size of the initial spread reflects the uncertainty facing the market maker in the opening order flow, where wider spreads indicate higher costs of adverse selection. Finally, the time of first trade signifies the level of uncertainty confronting underwriters of the IPO. The lead underwriter, who is often the primary market maker, has the option to delay the issue to observe the market open and to better gauge investor demand for the issue.

While we cannot completely rule out alternative explanations, the results lend support to the divergence of opinion hypothesis originally proposed by Miller (1977). In markets with restricted short selling, such as IPOs, Miller argues that more optimistic marginal investors determine market prices by including the issue in their portfolios. Short sale constraints initially limit pessimistic traders from reflecting their information in the market. Therefore, Miller predicts that greater uncertainty about an IPO corresponds to greater short-term underpricing and long-term underperformance.

We provide several contributions to the IPO literature and are the first to measure the long-run predictive power of the opening spread and time of first trade. These early market variables, along with the flipping ratio, provide unique information regarding the uncertainty and divergence of opinion about an IPO. The results are robust to measures of IPO quality and known asset pricing patterns. This study is also the first to empirically test and support Miller's (1977) divergence of opinion hypothesis for IPOs. Greater uncertainty about an IPO leads to greater long-run underperformance.■

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