

Discussion of “Why Don’t Issuers Get Upset About Leaving Money on the Table in IPOs?”

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In this article, Loughran and Ritter (2001; hereafter LR) provide an interesting new theory and empirical analysis. In this discussion I would like to elaborate on their analysis in several ways. First, in Section 1 I review Microsoft’s IPO process, as documented in a 1986 *Fortune* article, and related this to the LR model and evidence. In Section 2 I briefly discuss the LR model and its implications, and the empirical findings presented in LR that support the model. In Section 3 I present some additional empirical evidence suggesting that the LR prospect-theory model can’t fully explain the IPO puzzles. Section 4 proposes an alternative explanation for these data: namely that the data are consistent with a bargaining game in which the issuers’, underwriters’, and investors’ bargaining power changes with business and industry cycles. Section 5 concludes.

1. The Microsoft IPO

I would like to begin by looking at one particular IPO, that of Microsoft. Microsoft’s IPO took place on March 13, 1986. Over the period from October 1985 through the IPO date, reporters from *Fortune* magazine followed Bill Gates and his Microsoft team and Microsoft’s investment bankers from Goldman Sachs and Alex. Brown as they went through the IPO process. This process was documented in a July 1986 *Fortune* article entitled “Inside the Deal That Made Bill Gates \$350 Million” [Uttal (1986)]. This article gives a good summary of Microsoft’s IPO and is useful in providing background and perspective for LR’s article.

Microsoft selected their underwriters, Goldman Sachs and Alex. Brown, in December 1985, about three months before the offering date. On February 3, 1986, Microsoft filed their preliminary prospectus with the Securities and Exchange Commission (SEC), citing a price range of \$16–\$19. Of interest,

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according to *Fortune*,

The underwriters suggested a price range of \$17–\$20. Gates insisted on, and got, \$16–\$19. His argument was ultraconservative: \$16 would guarantee that the underwriters would not have to go even lower to sell the shares, while a price of \$20 would push Microsoft's market value above half-a-billion dollars, which he thought uncomfortably high.

Over the February 18–27 period, Microsoft (including Gates) and the investment banks undertook a road show, presenting to investors in eight cities. The month of February was a very good one for the market. The Dow rose from 1571 to 1709 (8.8%); the Center for Research in Securities Prices (CRSP) value-weighted (VW) index return for February was 7.3%.

On March 10, three days before the offering, Goldman suggested an offering price of \$20–\$21, saying that they expected the stock to open at \$25, specifically:

Eff Martin of Goldman, who had flown up to Seattle that morning, had good news. The “book” on Microsoft—the list of my orders from institutional investors—was among the best Goldman had ever seen. The underwriters expected the stock to trade at \$25 a share, give or take a dollar, several weeks after opening. The sounding of big potential buyers showed that an offering price of \$20 to \$21 would get the deal done.

Of interest, Gates, who had earlier insisted on the conservative filing range, didn't view this as good news:

Gates asked Martin to leave the room while he conferred with [his CEO and CFO] . . . “These guys who happened to be in good with Goldman and get stock will make an instant profit of \$4,” he said. “Why are we handing millions of the company's money to Goldman's favorite clients?” . . . The three decided on a range of \$21 to \$22.

Goldman responded:

coming out one dollar too high would drive off some high-quality investors. *Just a few significant defections could lead other investors to think the offering was losing its luster.* [my italics] Dobin [of Goldman] raised the specter of Sun Microsystems Because of overpricing and bad luck. . . . Sun's shares had dropped from \$16 at the offering to \$14.50 on the market.

Goldman and Microsoft eventually

compromised on a range of \$20 to \$22, with two provisos: Goldman would tell investors that the target price was \$21 and nothing less, and Dobin would report Monday on which investors had dropped out.

However,

Monday's news was mixed. Six big investors in Boston were threatening to . . . remove their names from Goldman Sach's list—T. Rowe Price, for instance, said it might drop out above \$20. But their spirits revived the next day as the Dow surged 43 points [$\sim 2.5\%$].

Two days later

[They] had no trouble agreeing on a final price of \$21. The market had risen another 14 points by noon. The reception for a \$15 offering that morning by Oracle . . . seemed a favorable omen: the stock had opened at \$19.25. About half the potential dropouts, including T. Rowe Price, had decided to stay in.

The next day (Tuesday, March 13) Microsoft opened at \$25.75, and closed at \$27.75.

It is important to bear in mind that these are anecdotes about a single IPO which may or may not generalize. Nonetheless, these anecdotes are useful in that they suggest several different interpretations of the empirical evidence.

One interesting thing here is that both the investment bankers and Microsoft clearly understood that the IPO was likely to be underpriced by \$4–\$6 per share given the offering price of \$21 and the anticipated market price of \$25, “give or take a dollar” (suggesting a fairly precise valuation). Moreover, Gates' statements make it apparent that he understood that the result of the underpricing would be a transfer of wealth from Microsoft's current shareholders to the investment banks' preferred clients.

However, the investment bank's response to the Microsoft demand for a just slightly higher price was that the below-market price was necessary to keep the “high-quality investors” from defecting. The argument suggests that these high-quality investors were in a strong bargaining position, meaning that there were relatively few of them, and therefore these high-quality investors could credibly threaten to pull out. The spirit of the argument appears to be that these high-quality investors had better information than other potential investors, and their participation provided a “certification” of the issue. These investors pulling out could result in something like an informational cascade [see Banerjee (1992), Bikhchandani, Hirshleifer, and Welch (1992), and Welch (1992)].¹

Of interest, at least one of the statements quoted above suggests that if these high-quality investors pulled out, it wouldn't necessarily mean that the

¹ Of course, one requirement for such an informational cascade is that other investors believe that the high-quality investors actually have some information. Two interesting questions are whether these high-quality investors really do have any significant private information, and whether other investors believe they have significant private information. It is possible that such private information concerns information on demand for this particular security from their brokerage clients' information as opposed to information directly about future cash flows.

issue would be undersubscribed, but rather that Microsoft's shares would end up trading below the offer price, and that this would be a bad thing. Presumably it would result in bad publicity and possibly more difficulty in raising money in the future [consistent with Welch (1989) and with the recent evidence of Barber and Odean (2001) on the effect of attention on individual buying behavior].

For the Microsoft IPO, as noted above, "half of the potential dropouts" apparently decided not to participate in the IPO, apparently because it would not be sufficiently underpriced. This seems pretty remarkable given the historical record on IPO returns.

One final interesting aspect of the Microsoft IPO, which is the key phenomenon explored in the LR article, was the apparent insensitivity of Microsoft's offer price to both market returns and to Microsoft specific news. Consistent with the evidence in the LR article, the quotes above suggest that the strong market moves up following the filing data have relatively little effect on the offering price that Microsoft chooses. Several of the last few quotes suggest that participants believe that strong positive market moves will ensure that the IPO "succeeds" (which apparently doesn't mean that the shares are sold at the highest possible price), and seem to ignore the idea that the offering price could be altered in response to market forces (i.e., to find the price at which supply equals demand).

2. The Prospect Theory Hypothesis

The hypothesis put forth in the LR article is that the empirical findings pre-viewed in the Microsoft example above and discussed below result (1) from loss-averse preferences on the part of the firm managers and shareholders, and (2) because "issuers treat the opportunity cost of leaving money on the table as less important than the direct fees." Issuers don't get upset about the severe underpricing, especially when the issue takes place at a price above the filing range, because of their loss-averse preferences: they have gained a lot on their shares, and the underpricing is a relatively small "loss," so they "irrationally" aggregate the two and are still relatively happy. In the LR model everyone anticipates this, and the idea is that an underwriter compensation schedule of this type maximizes issuer utility, given their PT-based preferences. This is something like a risk-sharing agreement, but is slightly different.

2.1 Empirical support for the model

The principal direct empirical implication of the LR model is the positive correlation between the filing price revision (equal to the difference between the midpoint of the filing price range and the offer price) and the first-day return. The intuition behind this implication is straightforward: the issuers anchor their reference point at the filing date, and following upward revisions,

are willing to tolerate higher levels of underpricing than following downward revisions.

This direct implication has several other indirect empirical implications, and LR show that several empirical findings are consistent with these implications. Specifically,

1. The average first-day return of IPOs, measured from the offering price to the first-day closing price, is strongly positive.
2. First-day returns are significantly positively autocorrelated.
3. Revisions (from the midpoint of the original filing price range given in the prospectus) are highly positively correlated with first-day return.
4. Revisions are positively related to past (15 day) market return, but not strongly enough.

Finding 1, that IPOs are underpriced, has been widely documented. Finding 2 is also a known empirical fact, consistent with the existence of "hot IPO markets." LR elaborate on this fact. For their sample they find that the average first-day return's autocorrelation is 0.50 at a lag of one month, and that $\rho(t, t-2) = 0.18$. Also consistent with this, LR find that the number of IPOs brought to market is highly autocorrelated.

The theory in this article is primarily designed to explain findings 3 and 4. Finding 3, first documented by Hanley (1993), is strong empirical. LR show that the average first-day return for firms which have had downward revisions from the filing price range is 4%, while the average first-day return for upward revisions is 32%. Also, in the regression presented in Table 5, LR show that the coefficient on past market return is 2.67 for upward revisions and 0.76 for downward revisions.² This evidence suggests that offer price movements are "insufficiently" sensitive to movements in the underlying price: if the upward revisions were larger, the first-day returns wouldn't be as high. This fact is one of the key findings supporting the theory here, and moreover is inconsistent with the dynamic information acquisition model of Benveniste and Spindt (1989). The Benveniste and Spindt theory implies that underpricing should be unrelated to the market return between the filing date and the issue date. LR instead find that it is strongly related.

3. Additional Empirical Evidence

Figures 1–3 present evidence that is inconsistent with the formal LR hypothesis, though perhaps not with an extension of the theory. Specifically, Figure 1 plots the autocorrelations at lags 1–18 of the average first-day IPO returns.³

² One thing in this table that merits future investigation is the low R^2 s of 1–2%. This number suggests that there is either tremendous idiosyncratic risk for these firms in this period, or the issuers and their investment banks do a really bad job of setting the filing price range.

³ The number of issues and average IPO first-day returns by month were obtained from Jay Ritter's Web site, bear.cba.ufl.edu/ritter.

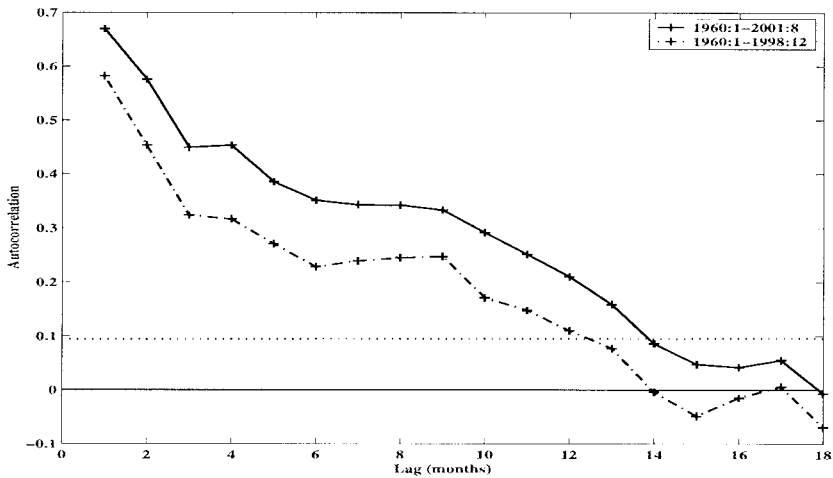


Figure 1
Average first-day return autocorrelations
This figure shows the monthly sample autocorrelations at lags 1–18 of the average first-day returns for IPOs. These are presented for the periods 1960:01–2001:08 and 1960:01–1998:12, for lags from 1 to 18 months. The horizontal dotted line represents the two standard error bound for the null that $\rho = 0$, calculated under the assumption that the first-day returns are independently normally distributed.

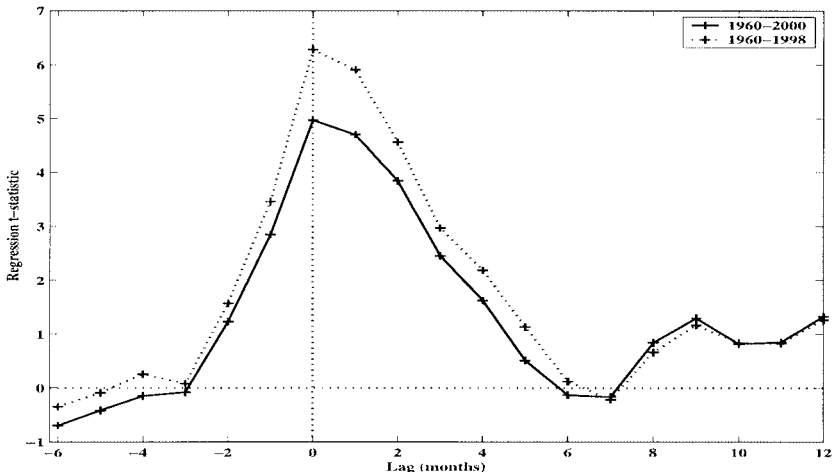


Figure 2
Slope coefficient t -statistics for regression of average IPO first-day return on lagged quarterly market return
This figure plots the slope coefficient t -statistics for a regression of the average IPO first-day return in month t on the quarterly CRSP VW index return from month $t - 3$ lag through month t lag. This is done for two periods, 1960:01–2000:12 and 1960:01–1998:12.

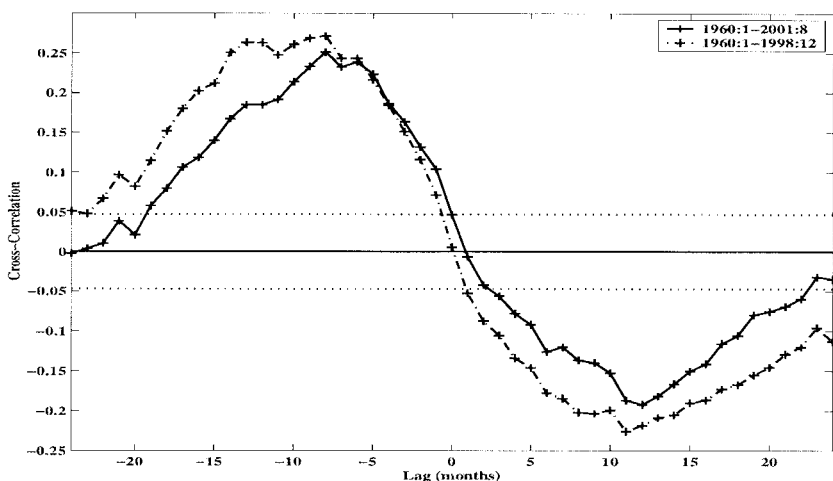


Figure 3

Cross-correlations between the number of issues and the lagged average first-day return

This figure shows the monthly sample cross-correlations at lags -24 to 24 between the number of IPO issues ($n(t)$) and IPO first-day returns ($r(t+\tau)$) over the period 1960:01–2000:02.

This figure shows that first-day returns are significantly positively autocorrelated out to 12–13 months.⁴ Recall that under the LR hypothesis, the reason for the positive autocorrelation of first-day returns is that the issuers set the reference point at the time of the initial filing. Consider the offerings that take place in May and June of a given year. The periods between the filing and offer dates for these two sets of offerings are at least partially overlapping. So since the first day return is positively related to new information arriving between the filing and offer dates, this will result in first-day returns being autocorrelated. However, based on this effect alone, the autocorrelation should persist only out to a lag of about two to three months. Figure 1 shows that it persists much longer. Also, Figure 1 shows that these long-lag autocorrelations are not simply a result of the unusual 1999 IPO market.

In Figure 2 I regress the average IPO first-day return in month t on the quarterly CRSP VW index return from month $t-3$ lag through month t lag. I ran this regression for two samples; again the second one excludes the unusual 1999 IPO market. For both sample periods, the regression coefficients show that the amount of underpricing is related to quarterly returns lagged three to four months.

⁴ There is some variation over time. Using the average monthly first-day returns from the 1960s, the sample autocorrelations are significantly positive out to lag 11, in the 1980s out to lag 8, and in the 1990s to lag 12. However, using 1970s first-day return data, only the first lag is significant. Also, Jay Ritter pointed out to me that “if penny stocks are removed [from the sample, then for the sample from] 1990–1997, the first-order autocorrelation of monthly average first-day returns is only 0.34, and the next six autocorrelations are statistically and economically close to zero.”

Finally, Figure 3 shows that the number of IPO offerings is related to the IPO first-day returns lagged about 12 months.⁵ This evidence suggests more firms decide to undertake IPOs about 12 months after the periods with the largest underpricing. Of interest, the contemporaneous (lag 0) correlation is relatively small.

4. An Alternative Interpretation of the Data

This additional evidence shows that IPO first-day returns are predictable using data available up to a year or so before the offering date. Thus it doesn't look like the variation in the underpricing can be completely explained by the prospect theory hypothesis. This story relies on loss aversion, with the reference point set as the midpoint of the offering price. This is clearly not the whole story here, as the period between the initial filing and the offer date is generally one to two months long.

The high auto- and cross-correlations at long lags in these data are suggestive of business cycle-like effects and hint at a bargaining-based theory. One possibility is that the issuing firms view hot IPO markets as a particularly good time to issue, perhaps because the prices of firms in the market as a whole or in their particular industry are particularly high.⁶ This would mean that any delay in issuing would be extremely costly. Thus, consistent with the results for the standard Rubinstein bargaining game, their bargaining position *vis-à-vis* the underwriters and the institutional investors would be poor, and the underwriters and its clients could insist on high levels of underpricing. If in a hot IPO market the issuing firm, rather than accepting the high underpricing, chose to switch to another investment bank, they would face long delays and perhaps the evaporation of the favorable climate for issuing. Moreover, after signing with another investment bank, this new bank would have the same incentives to underprice.

In a cold IPO market, where the climate for issuing is poor (e.g., in a business cycle trough), it seems likely that the issuer's cost of delay would be lower, and that the issuer's bargaining position would therefore be considerably stronger, as he could credibly threaten to drop out unless he receives a much higher issue price.

This story is still not complete. In a competitive underwriting market we would expect that high-quality underwriters would attempt to develop a reputation for lower underpricing. However, it is possible that the underwriting

⁵ The standard errors are calculated under the assumptions that the number of IPOs and the first-day returns are independently normally distributed. Also, I took another shortcut in calculating this cross-correlogram, in that I simply deleted all return-number pairs where the number of IPOs was zero, and hence the average first-day return was undefined. Since the number of IPOs is likely not i.i.d. normal, a better way to calculate statistical significance here would be with a bootstrap.

⁶ Some evidence for this story is in Ritter (1991) and Krigman, Shaw, and Womack (1999), who find that long-run returns are lower when underpricing is most extreme (see also footnote 13 of the LR article).

market is not competitive, or is simply not perceived as competitive by potential issuers (i.e., it is possible that issuers believe that there are only a few underwriters who can properly carry out the issue). Even if the underwriting market were competitive, underpricing in this model might be unavoidable if there is not a competitive pool of institutional investors. It is possible that, on any given issue, there are relatively few large "high-quality" institutional investors with good information about the issue—and if these issuers choose to not participate the other institutional investors might choose to drop out rather than be faced with the lemons problem suggested by Rock (1986). Given the high rents apparently available to these informed investors, it seems like there should be a competitive pool of informed institutional investors, but this may not be the case.⁷

5. Conclusion

Loughran and Ritter provide a very interesting analysis of a fascinating market. While their formal model is inconsistent with the additional data presented in Section 4, it is possible that an extension of their model may explain these data better. For example, these data might be consistent with a model in which the issuer's reference point is set far in advance of the issue date.

There are a number of interesting empirical findings here that merit further explanation. For example, the peculiar pattern of correlations between the number of issues and the average first-day returns (see Figure 3) is something that merits further investigation. Another empirical result that needs to be explained is the extremely low R^2 s in the regression of first-day returns on the revision from the filing price, though perhaps this reflects the high error in the midpoint of the filing price range.

Finally, some questions that merit further investigation include:

1. To what extent are revisions predictable using information available as of the preliminary prospectus date? Some evidence here suggests that expected revisions may be positive in good times—this would be inconsistent with the basic theory.
2. Are expected first-day returns ever negative? That is, do underwriters/institutional investors actually ever purchase the issue at prices which are ex ante too high?
3. LR show that first-day returns are predictable using the past market return. How predictable are first-day returns based on the revision

⁷ Another important question is why the amount of underpricing is not contracted on ex ante, for example, with penalties for the underwriter if there is too much underpricing. There could be legal problems with such an arrangement (i.e., the underwriter could argue the underpricing resulted from the issuer's actions), or it could be that risk sharing is more efficient with the standard arrangement.

components that are

- (a) ex ante predictable using public information,
 - (b) unpredictable using public information.
4. What determines the width of the filing price range? Does the width affect the eventual offer price (and underpricing)? How sensitive are first-day returns to offer price changes within the filing price range and outside the filing price range?⁸

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⁸ Jay Ritter points out, "In recent years, the SEC has required that the file price range be no greater than the maximum of \$2.00 or 10% of the midpoint. Almost all IPOs in the last decade have had a \$2.00 file price range."

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