

# Do Firms Time Equity Offerings? Evidence from the 1930s and 1940s

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*We investigate whether the timing of equity sales to exploit market overvaluation may account for the reported poor post-offer stock performance of firms issuing equity. We posit that rights offers, targeted to a firm's current shareholders, are less likely to be timed to exploit overvaluation. Our study compares firm commitment and rights offerings during 1933-1949 when rights offers were common. We find that abnormal returns for firms electing the firm commitment method were significantly negative over the year following the offer, while those for firms using rights were not. This suggests that firm commitments were timed, while rights offers were not.*

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Do managers elect to raise equity capital when the market appears to value a firm more highly than the value perceived by insiders? Investors seem to think so, as indicated by the significant stock price decline that tends to accompany announcements of seasoned equity offerings (SEOs). What are we to make, then, of the finding of significantly poorer stock price performance in the months after an offering (see Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Jegadeesh, 2000; and Ritter, 2003)?

Some researchers claim that underperformance may result from the selling of overpriced equity and the failure of market participants to react fully to the negative information conveyed in the announcement. Others argue that much, if not all, of the apparent underperformance may be the result of methodological problems such as improperly controlling for risk. Whether or not post-offer performance is abnormal, and whether the result is tied to offer timing, has important implications for market efficiency and managers considering equity offers.

We take a different tack in evaluating post-offer performance, and compare the stock performance of two types of equity offerings: rights offers and firm commitment seasoned equity offerings. The offerings are drawn from a unique data set from the 1930s and 1940s, when rights were as commonly used as firm commitments (which is not the case now). We conjecture that managers wishing to exploit private information and an overvalued stock price are more likely to do so at the expense of new outside investors by choosing a firm commitment over a rights offering.

Myers and Majluf (1984) argue that in firm commitment offerings managers would be expected to be more concerned with the welfare of insiders (including themselves) than with new investors in the firm's equity. Rights offerings, which involve a pro-rata distribution of rights, are aimed at current shareholders, although holders are usually allowed to sell their rights if they wish. Following the logic in Myers and Majluf, this would suggest that the incentive to time offers will be much weaker if not absent altogether in the case of rights offerings.

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The idea that managers may have different incentives when they choose a rights offering versus a firm commitment provides us with an approach to examine the importance of market timing in equity financing. We examine whether post-offer price performance is related to the decision to issue rights instead of a firm commitment offering. If market timing is an important factor affecting post-issue stock returns, we would expect to find significant differences in stock performance after rights offerings and after firm commitments. A significantly weaker stock performance after a firm commitment offering would be consistent with the notion that firm commitments are timed.

We focus on comparing the performance of firms that have all raised equity capital, although they differ in their methods. Estimating the *difference in performance* following the two types of equity offerings has certain robustness benefits. To the extent that performance estimates are biased by the methods used to compute abnormal returns, this bias is likely to be mitigated if we measure the relative performance following each type of equity offering, especially if we control for size of the offer, firm leverage, and other firm attributes.

Finally, we also provide evidence on market timing and post-offer long-run performance of equity offerings using data from an earlier era that is not usually studied today, when both rights offers and firm commitments were common. This provides for an out-of-sample test of post-offer performance compared to tests using more modern samples.

Our sample of equity offerings in the 1930s and 1940s is hand collected from *Cromwell Issuer Summaries*, a two-volume document prepared in connection with a case against underwriting firms, *US vs. Morgan* (New York District Court, 1951). The final sample contains 265 offers (79 firm commitments and 186 rights offers) by publicly traded US industrial firms. To control for various firm attributes, we also examine a smaller sample for which hand-collected accounting data from Moody's manuals is available.

There is evidence that both firm commitments and rights firms exhibit significantly positive abnormal returns prior to an offering. While it is well established that stock price run-ups tend to precede firm commitments, it is interesting that similar run-ups accompany rights offerings during this historical period. Such increases have been interpreted both as an opportunistic timing of equity sales by issuing firms (Lucas and McDonald, 1990), and as reflecting an improvement in firm operating performance (Choe, Masulis, and Nanda, 1993). In the setting we examine, we believe managers would choose a firm commitment over a rights offer if they viewed the stock price increase as too optimistic in light of their private knowledge. That is, they would be less likely to use a rights offering when the goal is to raise capital by selling overvalued equity to investors.<sup>1</sup>

We find significantly more negative abnormal returns during the year following the offer (adjusted either by the value-weighted index from the Center for Research in Security Prices or by a size- and industry-matched firm) for firm commitment firms than for rights offer firms. This finding is robust to the use of bootstrapping to obtain significance levels. Most of our tests assume independence, in spite of the clustering observed in the data, and this may result in overstated significance levels. Therefore, we also report results using a procedure designed to mitigate the effects of dependence caused by clustering.

We also show that differences in these abnormal returns are robust to controlling for the offer size, the firm's leverage, the market-to-book ratio, and other firm attributes. Hence, the evidence suggests that firms selling shares to current owners via rights offers did not appear

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<sup>1</sup>The literature on the rights offer choice decision focuses on transaction costs, asymmetric information and adverse selection costs, and liquidity issues. The premise underlying our study is that asymmetric information between managers and outside investors causes managers who perceive the firm's equity is overvalued to choose firm commitments over rights.

to be timing their issues to exploit overvalued equity, while firms selling to new owners were. These findings support the notion that the pattern of underperformance following firm commitments is tied to market timing.

We investigate whether the form of equity offering or the characteristics of the issuing firm are more closely related to post-offering underperformance. Using logit regressions, we examine whether there are significant differences between the characteristics of firms using rights and those using the firm commitment method. Our finding is that firms using rights offers in this period were larger, and had higher market-to-book ratios, higher return on assets, greater cash flow liquidity, and lower debt levels. Pre-offer run-ups are not significantly different across offer types. We argue the evidence indicates that rights offerings were generally chosen by the stronger or healthier firms. Since characteristics of firms issuing the two types of securities are significantly different, it is important to know whether the post-offering performance is attributable to issuer characteristics or to the type of offering selected. If the post-offering performance is largely explained by issuer characteristics, this would weaken any interpretation in favor of market timing. These issuer characteristics are observable *ex ante*, but they could still affect post-offer returns. For example, it is possible these factors are not efficiently incorporated into market prices during the time period we study, and it is also possible that they affect the risk characteristics of our sample firms in a way unaccounted for by the risk-adjusted post-offer returns we use.<sup>2</sup>

A logit model provides us a means to summarize the characteristics of the issuer in terms of the predicted probability of selecting a rights offering. To capture the extent to which the offering type is not explained by firm characteristics, we rely on the residual from the logit model. Our results indicate that the predicted probability of a rights offer, depending on issuer characteristics, is not significantly related to post-offer abnormal performance. The surprise component of the offer type decision, the residual from the logit model, is significantly and positively related to the post-offering abnormal performance. In other words, to the extent the rights method is chosen unexpectedly, post-offer abnormal returns are higher. This finding is consistent with a conclusion that firm commitment offers are timed, since the offer method choice is significantly related to post-offer performance even after controlling for firm characteristics.

The evidence we present contributes to the literature on equity offer announcement returns and post-offer performance, and suggests that firm commitments may indeed be timed to exploit overvaluation. The negative returns accompanying firm commitment announcements are likely due to negative information regarding the firm's true value conveyed by the announcement.<sup>3</sup>

There are also implications for managers and investors. Managers who do not believe the firm's equity is overvalued should consider ways to credibly signal their beliefs around equity offers. For example, managers might provide a credible signal by announcing their commitment to buy a material number of shares when the offer itself is announced. Investors should consider such signals when they evaluate the likelihood that management believes its firm's equity is overvalued.<sup>4</sup>

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<sup>2</sup>Authors such as Jegadeesh (2000) and Isagawa (2002) argue that stock market inefficiencies play a role in explaining abnormal performance following corporate events. Jegadeesh (2000) investigates whether abnormal performance following seasoned equity issues is due to improper risk adjustments, but argues the evidence is more supportive of a market inefficiency explanation.

<sup>3</sup>Several authors document a negative stock price response to announcements of firm commitment seasoned equity offerings (about - 3%) and other equity-related securities (see, for instance, Masulis and Korwar, 1986).

<sup>4</sup>Johnson, Serrano, and Thompson (1996) and Lee (1997) provide mixed evidence on whether share trading by insiders affects announcement returns, but they focus on dispersed trading by insiders in the months before an offer takes place, not a contemporaneous announcement by management to buy a material number of the shares being offered. It is not currently common for managers to announce they are participating in their firm's seasoned equity offers.

## I. Relevant Literature and Hypothesis

We first discuss possible explanations for the timing of offers to exploit market overvaluation. These explanations rely on market imperfections such as adverse selection and transaction costs. We also discuss the evidence on the timing of equity offers during hot issue markets, and the ways firms issue equity.

### A. Timing of Equity Sales

The adverse selection model in Myers and Majluf (1984) argues that when managers have more and better information than outsiders, equity is generally the least desirable form of new financing if managers are to act in the interest of current shareholders. In equilibrium, only managers of the poorest-quality firms will attempt to issue equity at any point in time unless they have no other choice. This insight suggests that managers considering a seasoned equity offering will prefer to wait until the market appears to overvalue the firm's stock.

This argument relies, however, on the assumption that managers act in the interest of current investors rather than of investors buying shares in the offering. Timing incentives should be absent therefore, or at least attenuated, when it comes to rights offerings, since the shares in this case are ostensibly targeted to current shareholders. The stock price announcements support the notion that firm commitments and rights offerings are received differently by the market; the announcement reaction is much more negative for firm commitment offers than it is for rights offers (Eckbo and Masulis, 1995).

It has been documented that most firms that issue seasoned equity do so following a run-up in their stock price. This has been explained as managers timing offers when they believe their shares are overvalued by the market, even at the cost of delaying investment opportunities (Lucas and McDonald, 1990). We therefore expect firm commitment offers to take place following stock price run-ups. It is also possible that stock price increases in the recent past could reflect improvements in a firm's prospects. Thus, rights offers could also take place after run-ups even if they are not timed. We examine returns from 13 to 2 months before the offer date to see if pre-offer price appreciation exists, but we do not expect this analysis to necessarily differentiate between firms using rights versus firm commitments.<sup>5</sup>

The literature has documented that equity offers are clustered in hot issue markets at times of strong stock market performance and business expansion (Eckbo and Masulis, 1995; and Loughran and Ritter, 1995). Baker and Wurgler (2000) present additional evidence of market timing over the 1928-1997 period. The timing we focus on is not based on macroeconomic factors, but rather on the extent to which the firm's equity is overvalued. Consistent with the evidence that timing is based to some extent on macroeconomic factors, however, we do find that offers are clustered in some years more than others. We perform additional analysis to determine the robustness of our results to controlling for the effects of clustering and dependence.

We use post-issue returns to separate the motivation for the method of equity issuance. Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), and Ritter (2003) find negative post-offer abnormal performance following seasoned equity offers (firm commitments). If managers time firm commitments to exploit the overvaluation of their firms by selling equity to outside investors, and the market does not fully incorporate this information, such negative post-offer

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<sup>5</sup>We do not have announcement dates, so we conclude the run-up period two months before the offer month to reduce the likelihood that the run-up is affected by the announcement. In untabulated results, we also move the pre-offer window back one additional month and find the qualitative evidence is not affected.

performance may result. Less negative post-offer performance should follow rights offerings, however, since (as we have argued) these offers are less likely to be timed to exploit overvaluation. We examine the post-offer performance of rights issues versus firm commitments, and show the results are robust to controlling for size and book-to-market effects.

We are not the first to examine whether adverse selection plays a role in equity issuance. Lee (1997), for example, provides evidence that long-run stock performance following certain types of SEOs is more negative when the insiders of the firm are net sellers of stock in the months preceding the offer. Houston and Ryngaert (1997) note that a merger in which the bidder pays with stock can be viewed as an equity issuance. When bidders structure an offer to protect targets against declines in the bidder's stock price before the merger is completed, they find a less negative reaction to the merger announcement in the bidder's stock. Providing such protection provides a signal that the bidding firm's management believes the bidder's stock is less likely to be overvalued. Hence, the less-negative announcement effect associated with such offers is consistent with mitigation of adverse selection concerns. Although we also investigate the role of adverse selection in equity offers, we exploit the SEO offer method choice to do so and analyze long-run performance rather than announcement effects.

## **B. Choice Between Firm Commitments and Rights Offerings**

Rights offers presumably entail lower direct expenses for firms who wish to issue equity, yet US industrial firms have seldom used rights offers in the last several decades (e.g., see Smith, 1977; and Eckbo and Masulis, 1995). Studies focusing on the rights offer choice focus on transaction costs such as direct fees and monitoring costs (Smith, 1977; Hansen and Pinkerton, 1982; and Hansen, 1989); asymmetric information and adverse selection costs (Heinkel and Schwartz, 1986; and Eckbo and Masulis, 1992), and liquidity issues (Kothare, 1997). In our earlier period, rights offers were at least as prevalent as firm commitment offers, and were obviously viewed as a mainstream equity offer method. Thus, we take it as a given that during our sample period both firm commitment and rights offers were viable offer methods, and exploit the different implications each offer method has for the timing of offers and post-offer performance.

## **C. Empirical Hypothesis**

If market timing is responsible for underperformance following firm commitments, we would not expect to find similar underperformance following rights offerings, as managers should not be expected to exploit current shareholders (which typically include themselves). Evidence supporting less severe underperformance following firm commitment offers than following rights offers would support the notion that a significant portion of the underperformance following firm commitment offers may be related to timing behavior and an incomplete announcement reaction by investors. Therefore, the hypothesis we investigate is that post-offer abnormal performance should be less negative for rights offers than for firm commitment offers.

## **II. Empirical Evidence**

Our sample is derived from *Cromwell Issuer Summaries* (1951), a document prepared by counsel for the defense for *US vs. Morgan* in New York District Court (1951). This document is purported to include all firm commitment and rights equity offers made during this time

period. We start with 366 equity offers by publicly traded US industrial firms between 1933 and 1949. This initial sample includes 176 firm commitment offers and 190 rights offers (the sample does not include offers using the best efforts method).

The *Cromwell* data allow us to obtain the gross proceeds of the offer, the type of offering, and the month of the offering (but not the announcement date). We use the Center for Research in Security Prices (CRSP) data to obtain monthly stock returns, and have enough data to examine returns for 265 offers (79 firm commitment offers and 186 rights offers). Requiring stock data limits our sample to firms that traded on the New York Stock Exchange (NYSE), because data for American Stock Exchange (AMEX) stocks are not available in CRSP until 1962. A higher proportion of rights offers are retained because firms choosing this offer method tend to be larger firms with better data coverage.

To more completely control for differing risk characteristics that may arise due to firm attributes, we hand-collect accounting data from *Moody's Industrial Manuals*. Such data are available for 176 of the offers (52 of the firm commitment offers and 124 of the rights offers). Hence, we examine two samples: 1) a broader sample of 265 offers for which return information is available, and 2) a subsample of 176 offers for which both return and accounting data are available.

## A. Univariate Return Analysis

We examine the returns during the year surrounding the offering and measure statistical significance in multiple ways. To measure a firm's pre-offer, market-adjusted cumulative abnormal return (CAR), we calculate each month's abnormal return by subtracting the monthly return of the CRSP value-weighted NYSE/AMEX index (including dividends) from the sample firm's monthly return (but this index consists of only NYSE stocks during our sample period because of CRSP's exclusion of AMEX stock prior to 1962). Monthly abnormal returns are then summed over the 12 months beginning 13 months and ending two months before the offer month. Pre-offer market-adjusted buy-and-hold returns are calculated by subtracting the compounded return on the CRSP value-weighted NYSE/AMEX index from the compounded return for the sample firm over the same 12 months.

Because the *Cromwell* data include only the month of the offer, by ending the pre-offer period at two months before the offer month, we aim to avoid including the announcement effect. The results are robust, however, to using months  $-12$  through  $-1$  or months  $-14$  through  $-3$ .

The matched-firm approach is analogous but adjusts returns using a size- and industry-matched firm. To qualify as a candidate for a match, the firm must not have had an equity offering during the 13 months before the offer month of the sample firm. We first match on the sample firm's three-digit SIC code by choosing the firm with the closest (common stock) market capitalization in the month preceding the sample firm's offer month, as long as the match firm has a capitalization within 25% of the sample firm's. A two-digit SIC match is used if no three-digit match is found; we require that two-digit matches have a capitalization within 50% of the sample firm's.

When a match firm is delisted, we replace it with another match. This occurs in four cases, and results are robust to dropping these four sample firms altogether. Firms without valid matches are excluded, so smaller samples are obtained in the matched-firm approach. For the time period we study, there are considerably fewer firms on CRSP to be considered for a match. We measure post-offer returns using the 12-month period beginning two months after the offer month ( $+2$  to  $+13$  months). The post-offer window begins at  $+2$  months, since

many of the rights offers likely had a subscription period that would extend beyond the offer month.<sup>6</sup>

Univariate return results are presented in Table I. Panel A reports pre- and post-offer abnormal buy-and-hold returns, adjusted by the market and also a size- and industry-matched firm. For the market adjustment method, the mean of pre-offer abnormal returns (item A1, months -13 through -2) is 24.87% for firm commitments and 24.39% for rights. The medians are 17.09% and 12.24%, respectively. The ratios of the means to the standard errors (i.e., the standard t-ratios) and the bootstrapped p-values show that the mean abnormal returns are significantly positive for both groups.<sup>7</sup>

The statistical tests reported in Table I assume independence, so the significance levels are likely to be overstated due to clustering in the sample. We discuss statistical tests designed to accommodate dependence later. As item A1 shows, there is no statistically significant difference between the pre-offer performances of the two groups. With the size and industry match adjustments, the pre-offer abnormal returns for firm commitment offers are less positive (and are even insignificant). As in the market-adjusted approach, however, we do not observe a statistically significant difference between the two types of offers.

Item A2 presents the buy-and-hold abnormal returns for the post-offer period (+2 to +13 months). Using the market adjustment approach, abnormal returns for the firm commitment offers are a mean -9.89%, while those for the rights offers are a mean -0.64% (medians are -16.75% and -2.86%, respectively). Thus, the firms making firm commitment offers experience substantially negative market-adjusted returns, while the rights firms earn market-adjusted returns that are only slightly negative.

The ratios of the means to standard errors and the bootstrapped p-values suggest the post-offer market-adjusted returns for firm commitments are significantly different from zero, while those for the rights are not. The standard t-statistic for differences in means has a p-value of 0.008, and the Wilcoxon signed rank test shows similar significance for the difference in medians ( $p = 0.001$ ). The bootstrapped p-value for differences in means is 0.016, also suggesting a high degree of significance. Hence, these results support our hypothesis that firms using rights offers should experience less negative post-offer performance. The results for post-offer returns are similar using the size and industry match approach.

Some argue that measuring absolute post-offer performance is sensitive to the risk-adjustment method used. Non-issuing firms may not be completely comparable to firms that issue equity, which would make benchmarked post-offer returns difficult to interpret. In our case, however, whether or not we use a matched-firm approach, ultimately we are comparing the post-offer performance of two groups of firms *that both issue equity*. This should considerably mitigate any problems attributable to the benchmark technique. Our methodology is further improved in a later section when we also control for any differences in the characteristics of firms choosing one offer type over the other.

Table I, Panel B, repeats the analysis using CARs rather than abnormal buy-and-hold returns. The results are similar. Post-offer abnormal returns are significantly negative for firm commitments but insignificantly different from zero for rights. These results are consistent with the notion that managers tend to choose firm commitments when they perceive the market is overvaluing the firm's equity. It is also possible, however, that firm characteristics

<sup>6</sup>Studies using more modern samples (e.g., Ritter, 2003) report that negative post-offer performance is most severe in the second year following the offer. We have also investigated returns in the second year, but do not find significant differences in abnormal returns in the second year (abnormal returns are small and insignificantly negative for both offer types). In our sample, the negative post-offer performance for firm commitments is concentrated in the first year following the offer. For the sake of space, we do not report results beyond the +2 to +13 window.

<sup>7</sup>The bootstrapping procedure generates 10,000 randomly drawn samples (drawn with replacement) of the variable of interest. Two-tailed p-values are generated directly from the distribution of the resulting 10,000 means.

Table I. Pre- and Post-Offer Returns

Panel A reports the sample firms' buy-and-hold returns, which are adjusted by subtracting one of two buy-and-hold returns: 1) that of the NYSE/AMEX value-weighted index (including dividends), and 2) that of a size- and industry-matched firm. The size and industry match is the firm closest in market capitalization in the month preceding the offer month within the same three-digit SIC industry, so long as the capitalization is within 25% of the sample firm's. A two-digit SIC code match is used otherwise, subject to the match firm having a capitalization within 50% of the sample firm's. Firms with offers during the 13 months preceding the sample firm's offer month are excluded from being a match, and sample firms with no valid match are deleted from the sample. Panel B reports analogous returns for the cumulative abnormal return (CAR) approach. Monthly abnormal returns are calculated by subtracting the monthly return for the value-weighted index (or matched firm) and then summing abnormal returns over the window considered. For p-values for differences in both panels, a t-test is used for means, and the Wilcoxon rank sums test is used for medians. The bootstrapped p-value for differences is for mean returns, using 10,000 draws. Windows include endpoints (i.e., they use 12 months of returns).

## Panel A. Adjusted Buy-and-Hold Returns

Adjustment Method:	Value-Weighted Index				Size and Industry Match			
	Firm Commit.	Rights	Diff.	p-value for Diff.	Firm Commit.	Rights	Diff.	p-value for Diff.
<b>1. Months -13 to -2</b>								
Observations	79	186			74	175		
Mean	24.87%	24.39%	0.48%	0.930	4.09%	10.77%	-6.68%	0.420
Median	17.09%	12.24%	4.85%	0.529	6.92%	5.31%	1.61%	0.659
Standard Error	4.67%	3.80%			7.10%	4.47%		
Mean / Std. Error	5.316	6.420			0.576	2.405		
Bootstrapped p-value	< 0.001	< 0.001		0.919	0.562	0.010		0.425
<b>2. Months +2 to +13</b>								
Observations	79	186			74	175		
Mean	-9.89%	-0.64%	9.25%	0.008	-10.53%	0.18%	-10.71%	0.018
Median	-16.75%	-2.86%	13.89%	0.001	-8.56%	0.00%	-8.56%	0.003
Std. Error	3.17%	1.91%			3.68%	2.46%		
Mean / Std. Error	-3.116	-0.335			-2.862	0.730		
Bootstrapped p-value	0.003	0.716		0.016	0.006	0.940		0.017



**Table I. Pre- and Post-Offer Returns (Continued)**

<i>Panel B. Cumulative Abnormal Returns</i>						
	<b>1. Months -13 to -2</b>					
<b>Observations</b>	79	186	74	175		
<b>Mean</b>	21.87%	19.23%	3.58%	8.78%	-5.20%	0.346
<b>Median</b>	16.52%	12.59%	3.25%	6.00%	-2.75%	0.451
<b>Std. Error</b>	4.03%	2.73%	5.07%	2.87%		
<b>Mean / Std. Error</b>	5.426	7.044	0.706	3.062		
<b>Bootstrapped p-value</b>	< 0.001	< 0.001	0.467	0.001		0.368
<b>2. Months +2 to +13</b>						
<b>Observations</b>	79	186	74	175		
<b>Mean</b>	-11.63%	0.16%	-11.22%	0.62%	-11.84%	0.008
<b>Median</b>	-13.05%	0.47%	-12.70%	-0.13%	-12.57%	0.005
<b>Std. Error</b>	3.11%	1.84%	3.60%	2.46%		
<b>Mean / Std. Error</b>	-3.728	0.087	-3.118	0.255		
<b>Bootstrapped p-value</b>	< 0.001	0.938	0.002	0.812		0.007

in each offer type differ, so the returns are affected by different risk characteristics for which the univariate returns do not control.

Loughran and Ritter (1995) and Baker and Wurgler (2000), among others, find that equity issues tend to be clustered through time. Brav (2000) shows that such clustering can lead to incorrect statistical inferences regarding post-offer long-run abnormal returns because many returns will overlap. Table II reports the distribution of the sample offers across the sample period. There are noticeable clusters of offers in 1936-1937 and 1944-1949, yet the results in Table I assume independence and make no adjustments for clustering effects.

To mitigate the effects of clustering and dependence, we use two different methods: double-randomized bootstrapping, and time series portfolios. First, we report statistics from a double-randomized bootstrapping approach. Essentially, we modify the standard bootstrapping approach so that no offer year is sampled more often than any other in generating random samples. This greatly reduces the extent to which return observations will overlap, and thus calculates statistics based on a new sample whose observations are much more independent.<sup>8</sup>

Because this procedure forces observations to be evenly spread across the years (in aggregate), it also generates means and medians that can materially differ from those in the actual underlying sample. Therefore we report not only the bootstrapped p-values, but also the bootstrapped means and medians upon which they are based.

Panel A of Table III reports the bootstrapped results for the post-offer abnormal returns.<sup>9</sup> When returns are adjusted by the market, the mean and median abnormal returns for firm commitments are significantly negative and those for rights offers are not. The key result is that post-offer abnormal returns for the two offer types are significantly different ( $p < 0.001$ ). Inferences are similar for size- and industry-adjusted returns and cumulative abnormal returns. For both the buy-and-hold and CAR approach, we continue to find that mean and median post-offer abnormal returns are significantly different for the two offer types, and the p-value for differences ranges from less than 0.001 to 0.034.<sup>10</sup>

Running calendar time portfolio regressions as in Fama and French (1993) offers another way to test for significant post-offer performance. As Table II shows, however, there are years in which no offer of any kind is made, so this approach would be problematical. Bradley, Jordan, and Ritter (2003) use a time series portfolio approach that addresses concerns about dependence caused by clustering (and overlapping returns). This approach calls for computing portfolio returns and estimating a single variance for the entire portfolio using a post-event window instead of individual firm variances. We follow this approach, estimating the variance for each offer type portfolio using the 36 post-offer months beginning with month +25.

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<sup>8</sup>To generate one random sample, for each observation we first draw a year at random and then draw a random offer from firms making an offer in the selected year, where all draws are made with replacement. We generate 10,000 such samples and calculate the corresponding 10,000 means and medians. Two-tailed p-values are generated directly from the distribution of means and medians.

<sup>9</sup>In results not tabulated for the sake of brevity, we continue to find that pre-offer abnormal returns are positive and not significantly different for the two offer types when using the double-randomized bootstrapping approach.

<sup>10</sup>We also try a monthly calendar time approach, and we continue to find that post-offer returns are significantly different for firm commitments and rights. In this approach, using a single observation in each month (the portfolio return of all firms with a post-offer return (within +2 to +13) for the month in question) mitigates the effects of time clustering. The approach we use is similar to one used in Brav and Gompers (1997), except that we perform statistical testing on the monthly portfolio returns instead of compounding monthly returns to form annual returns. Finally, to mitigate the effects of industry clustering as documented in Brav (2000), we repeat the bootstrapping approach using two-digit SIC industries instead of years. An industry is selected at random, and then a firm within that industry is selected at random, so that across all bootstrapped samples each industry is sampled evenly. Again we find significant differences in the post-offer returns of firms using firm commitments and rights.

**Table II. Distribution of Offers Through Time**

Distribution of firm commitment and rights offers throughout the 1933-1949 sample period.

Year	Firm Commitments		Rights		All Offers	
	No. of Offers	% of Firm Comm. Sample	No. of Offers	% of Rights Sample	No. of Offers	% of Overall Sample
1933	2	2.5%	3	1.6%	5	1.9%
1934	0	0.0%	1	0.5%	1	0.4%
1935	0	0.0%	6	3.2%	6	2.3%
1936	5	6.3%	29	15.6%	34	12.8%
1937	4	5.1%	30	16.1%	34	12.8%
1938	0	0.0%	5	2.7%	5	1.9%
1939	0	0.0%	6	3.2%	6	2.3%
1940	5	6.3%	6	3.2%	11	4.2%
1941	2	2.5%	4	2.2%	6	2.3%
1942	0	0.0%	0	0.0%	0	0.0%
1943	5	6.3%	4	2.2%	9	3.4%
1944	8	10.1%	13	7.0%	21	7.9%
1945	8	10.1%	18	9.7%	26	9.8%
1946	19	24.1%	28	15.1%	47	17.7%
1947	10	12.7%	6	3.2%	16	6.0%
1948	5	6.3%	19	10.2%	24	9.1%
1949	6	7.6%	8	4.3%	14	5.3%
Total	79		186		265	

Mean monthly returns for the time series portfolio approach are reported in Panel B of Table III. We find that the mean monthly post offer abnormal return (for +2 to +13 months) is negative and statistically significant for firm commitment offers, and insignificant for rights offers. The key result is that post-offer abnormal returns are statistically different for the two groups.<sup>11</sup>

## B. Firm Characteristics by Offer Type

Table IV summarizes accounting data across the two offer types for the subsample of firms for which the data are available. The accounting data (and also the market value of common stock, used to measure the market-to-book ratio) are sampled at the latest fiscal year-end prior to the offer month (i.e., pre-offer amounts are used). Table IV shows that firms choosing rights offerings tend to have larger mean assets; the difference is weakly significant if logs are taken.

Firms selecting the rights method also make smaller offers, as the relative offer size (Reloffsize) has a significantly smaller median. We define the relative offer size as the gross proceeds divided by the sum of the pre-issue market value of common stock and the book value of preferred stock. We include preferred stock since it was used regularly during our sample time period, although excluding it does not alter any inferences. The median relative offer size is 0.157 for firm commitment firms and 0.127 for rights firms.

<sup>11</sup>We find significant differences using a wide variety of windows for estimating the variances, including pre-event windows. In using post-event windows, the result is also invariant to whether or not we include sample firms that delist before the end of the estimation window.

**Table III. One-Year Post-Offer Return Results Weighing Each Cohort Year Equally, Adjusted for Time Clustering and Dependence**

Panel A reports statistical tests for post offer returns (over the 12 months from +2 to +13 months after the offer) using a bootstrapped approach that mitigates the effects of clustering. Each observation in the sample is drawn using a double-randomized procedure: first, a random year is drawn, and then a random return is drawn from the returns of firms making offers in the selected year. The procedure is designed so that no offer year is sampled more than any other. All draws are made with replacement, and 10,000 samples are generated. The mean (median) shown is the mean (median) of all 10,000 bootstrapped sample means (medians). Panel A1 reports statistics for buy-and-hold returns, adjusted by subtracting one of two buy-and-hold returns: 1) that of the NYSE/AMEX value-weighted index (including dividends), and 2) that of a size- and industry-matched firm. The size and industry match is the firm closest in market capitalization in the month preceding the offer month within the same three-digit SIC industry, so long as the capitalization is within 25% of the sample firm's. A two-digit SIC code match is used otherwise, subject to the match firm having a capitalization within 50% of the sample firm's. Firms with offers during the 13 months preceding the sample firm's offer month are excluded from being a match, and sample firms with no valid match are deleted from the sample. Panel A2 reports analogous statistics for a cumulative abnormal return (CAR) approach. Monthly abnormal returns are calculated by subtracting the monthly return for the value-weighted index (or matched firm) and then summing abnormal returns over the return window. P-values are two-tailed and are calculated directly from the distribution of means (or medians). Panel B reports results using a time series portfolio approach. Mean monthly portfolio returns are reported (over +2 to +13 months), where each firm's return in the portfolio is adjusted by either the NYSE/AMEX value-weighted index (including dividends) or a size- and industry-matched firm. To gauge statistical significance, a single variance is estimated for each offer type using monthly portfolio returns. P-values are two-tailed, and the test for differences in means between offer types pools each offer type's estimated portfolio variance.

*Panel A. Adjusted Buy-and-Hold & Cumulative Abnormal Returns & p-values, Adjusted for Time Clustering*

Adjustment Method:	Value-Weighted Index				Size and Industry Match			
	Firm Commit.	Rights	Diff.	p-value for Diff.	Firm Commit.	Rights	Diff.	p-value for Diff.
<b>A1. Buy-and-Hold Returns</b>								
Observations	79	186			74	175		
Mean	-13.75%	-0.97%	-12.78%	< 0.001	-13.47%	-4.15%	-9.32%	0.034
P-value for Mean	< 0.001	0.617			< 0.001	0.114		
Median	-18.36%	0.11%	-18.47%	< 0.001	-13.62%	-2.77%	-10.85%	0.008
P-value for Median	< 0.001	0.949			0.008	0.142		
<b>A2. Cum. Abnormal Returns</b>								
Observations	79	186			74	175		
Mean	-13.54%	3.50%	-17.04%	< 0.001	-14.12%	-3.42%	-10.70%	0.015
P-value for Mean	< 0.001	0.114			< 0.001	0.224		
Median	-13.03%	2.04%	-15.07%	< 0.001	-14.29%	-3.70%	-10.59	0.009
P-value for Median	< 0.001	0.154			0.008	0.070		

*Panel B. Time Series Portfolio Approach for Mean Monthly Post-Offer Returns*

<b>Buy-and-Hold Returns</b>								
Observations	79	186			74	175		
Mean Monthly Port. Return	-0.97%	0.01%	-0.98%	< 0.001	-0.97%	0.00%	-0.97%	0.002
p-value	0.015	0.948			0.032	0.986		

**Table IV. Offer and Firm Characteristics**

Accounting items are book values, measured at the latest date possible prior to the offer date (i.e., pre-offer amounts are used). *Log(Assets)* is measured as the natural log of the book value of assets. *Reloffsize* is the offer size, defined as gross proceeds divided by the market value of common stock and book value of preferred stock. The market value for *Mkt/Book* is the market value of common stock plus the book values of preferred stock, long-term debt, and current liabilities, and *Book* is total assets. *ROA* is return on assets (net income divided by assets). *Current* is the current ratio (current assets divided by current liabilities). *Leverage* is long-term debt divided by assets. *Leverage2* is similar but adds current liabilities in the numerator. P-values for differences in means are based on a standard t-test, while those for medians are from a Wilcoxon rank sums test.

		<b>Firm Commitment (n = 52)</b>	<b>Rights (n = 124)</b>	<b>p-value for Difference (Rights vs. F.C.)</b>
Assets (000s)	Mean	49,305	96,171	0.267
	Median	27,389	29,494	0.210
Log(Assets)	Mean	10.002	10.370	0.100
	Median	10.218	10.292	0.210
Reloffsize	Mean	0.186	0.159	0.199
	Median	0.157	0.127	0.047
Mkt/Book	Mean	1.268	1.447	0.062
	Median	1.125	1.273	0.365
ROA	Mean	0.030	0.072	0.116
	Median	0.052	0.069	0.032
Current Ratio	Mean	2.939	4.027	0.003
	Median	2.780	3.307	0.048
Leverage	Mean	0.134	0.066	0.001
	Median	0.012	0.000	0.001
Leverage2	Mean	0.357	0.257	<0.001
	Median	0.355	0.224	<0.001

There is weak evidence in Table IV that rights firms have higher mean market-to-book values (*Mkt/Book*), measured as the market value of stock, plus the book values of preferred stock and debt, divided by the book value of assets.

Rights firms have a higher median pre-issue return on assets (*ROA*), measured as net income divided by assets. The median *ROA* is 0.052 for firm commitment firms and 0.069 for rights firms. Rights firms are more liquid, as evidenced by their higher current ratios (measured as current assets divided by current liabilities). The mean current ratio for firm commitment firms is 2.939, while that for rights firms is 4.027. Medians are also higher for right firms, and the differences in both means and medians are statistically significant.

Finally, rights firms have less leverage. For example, when leverage is measured as the

ratio of long-term debt to assets (Leverage), the mean leverage ratio is 0.134 for firm commitment firms and 0.066 for rights firms, and the difference is statistically different. Medians are also statistically different, as are means and medians if the leverage ratio includes current liabilities (Leverage2). It is interesting to see that debt levels are lower during this 1933-1949 period than more recently, consistent with the findings in Christie and Nanda (1994).

We interpret the overall picture to indicate that rights firms are larger, and generally stronger firms with better operating performance than the firms choosing firm commitment offers.

### C. Robustness of Post-Offer Return Results Conditional on Firm Characteristics

Table V presents logit regressions using an indicator variable set to one if a rights offer is chosen. These regressions allow us to simultaneously 1) determine which firm attributes are significantly different across firm types conditional on offer method, and 2) determine whether pre- and post-offer abnormal returns are significantly different after controlling for firm attributes. The first three models use abnormal buy-and-hold returns adjusted by the market (using the value-weighted NYSE/AMEX index from CRSP), while the last three models use returns adjusted for size and industry matches. The results are very similar if CARs are used instead of abnormal buy-and-hold returns, so we do not report the results using CARs.

Model 1 shows that the firm attributes significantly associated with the rights method are firm size [Log(assets)], the current ratio (Current), and the leverage ratio (Leverage). The coefficient on log(assets) is positive with a p-value of 0.052; the coefficient on the current ratio is positive with a p-value of 0.031, and that on the leverage ratio is negative with a p-value of 0.001. The pre-offer abnormal return is not significantly associated with the offer type, consistent with the univariate results.

Model 2 repeats Model 1 but adds the post-offer abnormal return, which has a positive and significant coefficient ( $p = 0.013$ ). Obviously the post-offer abnormal return cannot directly predict the offer choice a firm makes—the interpretation is simply that post-offer returns are significantly different across offer types, even after controlling for various firm attributes. Alternatively, we can view the post-offer abnormal return as an ex-post measure related to the extent to which management may have believed the firm was overvalued. The results suggest that firms choosing the rights method are less likely to be timing their offers, since post-offer abnormal returns are significantly higher even after further attempts to control for risk.

In Model 3 we substitute the size-decile rank of the firm (Sizedecile) using the (common stock) market capitalization relative to other firms traded on the NYSE and included in the CRSP database. Since our sample period covers 17 years, the asset sizes of offering firms in the beginning of the sample may not be comparable to those at the end of the sample. The size decile approach makes sizes comparable across the sample years. The results continue to show that rights firms are larger, although the size decile variable is less significant than the log of assets.

Models 4 through 6 use abnormal buy-and-hold returns adjusted by size- and industry-matched firms. Results for post-offer abnormal returns are similar. In untabulated regressions, we also find similar results using a weighted logit regression approach designed to reduce the influence of years with many observations. The overall conclusion is that post-offer abnormal returns are higher for firms choosing rights offers, even after controlling for size, industry, and a variety of firm characteristics. Results of the six models are consistent with our hypothesis, in that after controlling for firm characteristics post-offer abnormal returns are significantly higher for firms choosing the rights method.

**Table V. Rights vs. Firm Commitments Logit Regressions**

The dependent variable is *Right* = 1 if rights, and 0 if firm commitment. Accounting items are book values, measured at the latest date possible prior to the offer date (i.e., pre-offer amounts are used). *Sizedecile* is the firm's decile rank (1 for the smallest, and 10 for the largest) based on the market-based equity capitalization of all NYSE/AMEX stocks just prior to the offer. *Reloffsize* is the offer size, defined as gross proceeds divided by the market value of common stock and book value of preferred stock. The market value for *Mkt/Book* is the market value of common stock plus the book values of preferred stock, long-term debt, and current liabilities, and *Book* is total assets. *ROA* is return on assets (net income divided by assets). *Current* is the current ratio (current assets divided by current liabilities). *Leverage* is long-term debt divided by assets. *Pre-return* is the firm's adjusted buy-and-hold return (in percent) over the period -13 through -2 months relative to the offer month (adjusted by the market or by a size- and industry-matched firm). *Post-return* is similarly defined but over the period +2 through +13 months. Value-weighted adjusted returns subtract the buy-and-hold return for the NYSE/AMEX value-weighted index. Industry- and size-adjusted returns subtract a firm matched on market capitalization and industry. P-values are in parentheses beneath the coefficients.

Model	(1)	(2)	(3)	(4)	(5)	(6)
Method for Adjusting Returns	Value Wtd.	Value Wtd.	Value Wtd.	Size & Ind.	Size & Ind.	Size & Ind.
Constant	-3.233 (0.096)	-3.513 (0.079)	-0.503 (0.529)	-3.224 (0.104)	-2.656 (0.185)	-0.127 (0.874)
Log(assets)	0.325 (0.052)	0.343 (0.045)	- -	0.336 (0.051)	0.285 (0.099)	- -
Sizedecile	- -	- -	0.148 (0.083)	- -	- -	0.115 (0.184)
Reloffsize	0.075 (0.961)	0.097 (0.951)	0.126 (0.937)	-0.716 (0.644)	-0.530 (0.737)	-0.538 (0.736)
Mkt/Book	0.381 (0.228)	0.517 (0.131)	0.211 (0.520)	0.317 (0.320)	0.344 (0.300)	0.097 (0.764)
ROA	0.539 (0.698)	0.087 (0.950)	0.381 (0.783)	0.188 (0.894)	0.284 (0.841)	0.558 (0.690)
Current	0.230 (0.031)	0.253 (0.023)	0.245 (0.028)	0.227 (0.032)	0.230 (0.033)	0.220 (0.041)
Leverage	-4.806 (0.001)	-5.009 (0.001)	-4.332 (0.003)	-4.635 (0.002)	-5.005 (0.001)	-4.434 (0.002)
Pre-return	-0.003 (0.476)	-0.004 (0.358)	-0.426 (0.265)	0.002 (0.501)	0.001 (0.803)	0.001 (0.872)
Post-return	- -	0.019 (0.013)	0.019 (0.012)	- -	0.012 (0.046)	0.012 (0.039)
Chi-sq. p-value	(0.001)	(< 0.001)	(< 0.001)	(0.001)	(< 0.001)	(0.001)
No. of Rights	124	124	124	119	119	119
No. of Observations	176	176	176	170	170	170

An issue we have not addressed is the investment banker's role. The sample of rights offers includes both uninsured (or pure) rights offers and stand-by offers, where an investment banker commits to subscribe any rights that investors leave unsubscribed. Of the 124 rights in Table V, 44 are uninsured rights and 80 are stand-by rights. Thus, in 132 of the offers in Table V an investment banker is involved through either a firm commitment offer or a stand-by rights offer, and in 44 offers (the pure rights offers) there is no investment banker involvement. In results not tabulated, we find that the return results are not explained by investment banker involvement. For example, if we estimate the logit regressions using 1 for investment bank involvement instead of the choice of a rights offer, the post-offer abnormal return variable is insignificant.<sup>12</sup>

Another approach to establish the significance of the differences in post-offer abnormal returns between offer types is to regress post-offer abnormal returns on a rights offer indicator variable and the various control variables. This approach yields for the indicator a positive and significant coefficient of 0.111 (p-value = 0.014) when market-adjusted returns are used (results not tabulated). This implies the abnormal returns over the year following the offer are 11% higher for the firms choosing the rights method. We also find significant results using a size- and industry-matched approach for the post-offer abnormal returns.

If stronger and healthier firms are indeed more likely to choose the rights method during the time period we study, then the offer choice should be somewhat anticipated. The predicted probability values from a logit regression (excluding the post-offer return) can thus serve as estimates of the likelihood of a rights offer (conditional on an equity offer being made), or the anticipated portions of the offer method decision. In some sense, the predicted probability is a summary indicator for the firm characteristics that are helpful in predicting the offer choice.

Model 1 in Table VI presents a regression of the post-offer abnormal return (adjusted by the market return using the value-weighted CRSP index) on the probability of a rights offer. A two-step procedure is used. In the first step, we estimate a logit regression setting the dependent variable *Right* equal to 1 for a rights offer and 0 otherwise. The model estimated is the same as Model 1 in Table V. For the second step, we use the fitted value for each observation from the estimated logit model. The fitted value is the probability the rights method is selected over the firm commitment method, labeled as "PredRight". The residual, which we label "UnexpRight" to denote its interpretation as the unexpected component of the rights decision, is defined as  $UnexpRight = Right - PredRight$ . We then use *PredRight* and *UnexpRight* as regressors in ordinary least squares regressions whose dependent variable is the abnormal post-offer return. The Model 1 coefficient on the predicted right (*PredRight*) is not significantly different from zero (p-value = 0.746).

Model 2 regresses the post-offer abnormal return on the *UnexpRight* (i.e., the residual) from Model 1 in Table V. As discussed, *UnexpRight* is the unexpected component of the decision to use a rights offer. A positive value for *UnexpRight* implies the rights method is selected, and it size measures the extent to which the rights method chosen is a surprise. A negative value implies the firm commitment offer is chosen, and the more negative the residual, the more unexpected the decision to use the firm commitment method.

*UnexpRight* in Model 2 has a positive coefficient, and is highly significant (p-value = 0.014). The same result is obtained in Model 3, which also includes *PredRight*. The implication is that the post-offer abnormal returns are positively related to the extent that the rights method is unexpectedly chosen.

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<sup>12</sup>Estimating the models in Table V using the rights indicator variable as the dependent variable and an investment bank indicator variable as an additional independent variable, the post-offer abnormal return retains its significance in each model.



**Table VI. Ordinary Least Squares Regressions Predicting Post-Offer Returns**

The dependent variable is *Post-return*, which is the firm's adjusted buy-and-hold return (in percent) over the period +2 through +13 months relative to the offer month. Value-weighted adjusted returns subtract the buy-and-hold return for the NYSE/AMEX value-weighted index. Industry- and size-adjusted returns subtract the buy-and-hold return of a firm matched on market capitalization and industry. *PredRight* is the probability a rights offer is selected based on firm characteristics, computed from a Table V logit regression (either Model 1 or Model 4). *UnexpRight* is the residual from the logit regression, i.e.  $UnexpRight = Right - PredRight$ , where *Right* is an indicator equal to 1 if a rights offer is used. Heteroskedasticity-consistent p-values are in parentheses beneath the coefficients.

Model	(1)	(2)	(3)	(4)	(5)	(6)
Table V Model for <i>PredRight</i>	1	1	1	4	4	4
Method for Adjusting Post-Return	<b>Value Wtd.</b>	<b>Value Wtd.</b>	<b>Value Wtd.</b>	<b>Size &amp; Ind.</b>	<b>Size &amp; Ind.</b>	<b>Size &amp; Ind.</b>
Constant	-0.145 (0.989)	-3.303 (0.078)	-0.601 (0.951)	-4.558 (0.697)	-0.061 (0.060)	-4.918 (0.661)
<i>PredRight</i>	-4.481 (0.746)	-	-3.834 (0.762)	0.229 (0.988)	-	0.744 (0.959)
<i>UnexpRight</i>	-	11.831 (0.014)	11.797 (0.014)	-	11.427 (0.052)	11.432 (0.051)
Adj. R-square	-0.005	0.034	0.030	-0.006	0.020	0.014
No. of Observations	176	176	176	170	170	170

Models 4 through 6 repeat the analysis using size- and industry-adjusted returns (using logit Model 4 in Table V to estimate *PredRight* and *UnexpRight*). Similar results to those in Models 1 through 3 are observed, although the p-values for *UnexpRight* are around 0.05. We also find similar results using a weighted least squares approach that reduces the influence of years with many observations.

The overall interpretation is that it is the offer choice, and not firm characteristics (for which we can control with the *PredRight* variable), that helps to explain post-offer abnormal performance. The evidence is consistent with the timing hypothesis, along with an incomplete market announcement reaction. The post-offer underperformance of the firm commitment firms is explained by the offer choice itself, and not by the characteristics of the firm.

### III. Concluding Remarks

Our examination of the nature of market timing involved in firm commitment equity offerings takes advantage of a unique data set of equity offers during 1933-1949, when rights were as frequently used as firm commitment offerings. The data are used to examine whether post-offer performance after firm commitment offers is significantly more negative than performance following rights offers. Support for this hypothesis can be construed as providing support for the hypothesis that the underperformance following firm commitment offerings is at least partially linked to managerial timing (along with an incomplete announcement reaction).

Managers of overvalued firms who issue equity to exploit new investors would naturally be expected to choose the firm commitment method. Managers issuing equity through a rights offer are less likely to perceive their firm as overvalued, given their offer choice.

Our finding is that both offer types follow strong stock price performance prior to the offer. Post-offer performance, however, differs significantly between the two offer methods. We find that firms making firm commitment offers experience negative post-offer abnormal performance following their offers. Post-offer abnormal returns are much less negative for firms using the rights method. These results suggest that firm commitments were more likely to be associated with companies timing their offers to exploit overvaluation, while rights offers were not.

Even though it is based on an earlier time period, the finding that rights offers have been less likely to be timed has current relevance for today's equity offering process. Today, the firm commitment offer has become the method of choice for most firms. One important implication of our work is that manager and insider participation in an equity offering may mitigate adverse selection problems in firm commitments. By communicating their commitment to purchase a meaningful portion of the offered equity, managers may well signal they are not timing the firm's offer. ■

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