

Is There a Window of Opportunity for Seasoned Equity Issuance?

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ABSTRACT

The aggregate volume of equity issues is used to search for periods when seasoned equity capital can be raised at favorable terms. We find that the price reaction to equity issue announcements in high equity issue volume (HOT) periods is approximately 200 basis points lower on average than in low equity issue volume (COLD) periods. The lower price reaction in hot markets is economically important and is independent of the macroeconomic characteristics of hot and cold markets. The evidence supports the existence of windows of opportunity for equity issues that result at least partially from reduced levels of asymmetric information.

THE EXTREMES IN EQUITY issue volume that result from the clustering of equity issues in certain time periods has been well documented in studies dating back to Hickman (1953) and, more recently, Choe, Masulis, and Nanda (1993). The observed clustering of equity issues is consistent with the widely held belief of the investment community that certain periods offer a "window of opportunity" in which capital can be raised at favorable terms.¹ One explanation for windows is Myers' (1984) view that asymmetric information results in information costs that are of sufficient magnitude to force firms into a financing "pecking order" in which new equity is used only after internal funds and debt capacity have been exhausted. In searching for ways to reduce information costs, Myers and Majluf (1984) suggest that firms may be able to time their equity issues for periods when the level of asymmetric information is low. While many papers subsequently allude to or build on this idea, there is little empirical evidence documenting whether the existence of windows of opportunity is consistent with time-varying asymmetric information.

We search for windows of opportunity by linking the decision to issue seasoned equity with the costs of issue. If information costs are a significant

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¹ *Investment Dealer's Digest* (March 21, 1991, p. 10) quotes Richard Smith, syndicate manager at Montgomery Securities: "There's an attitude on Wall Street that the *window* is generally open for a short time; it's been closed for so long." Noting that equity deals are again possible, Smith adds that the fear of missing the window could force many companies into the market.

deterrent to equity issue, then periods of reduced information costs should be periods of relatively high issue volume. In contrast to previous studies that identify periods when issue conditions might vary based on macroeconomic criteria (see Choe, Masulis, and Nanda (1993), and Moore (1980)), we use the aggregate volume of equity issues to identify the periods when conditions are most favorable or unfavorable for issue. The difference in selection criterion is important because there is relatively little overlap between the volume-defined hot and cold issue periods and the periods based on macroeconomic conditions. This does not suggest that macroeconomic factors are unimportant influences on issue volume or information costs, only that they are not the exclusive factor motivating issue.

To provide evidence on the existence of windows, we compare the cumulative announcement date prediction errors for equity issue announcements, $CAPE(-1, 0)$, in high equity volume periods (HOT) to low equity volume periods (COLD), controlling for other factors known to affect prediction errors. Our goal is to determine whether there are periods when announcement date prediction errors are less negative, on average, than in other periods. However, since announcement date prediction errors can vary for a number of reasons, some care must be taken to define "windows." We define windows of opportunity to be time periods when information costs are reduced for *all* firms. Therefore, hot issue markets constitute windows of opportunity only to the extent that the observed variations in announcement date prediction errors are independent of the characteristics of the issuing firm.

In general, models of asymmetric information suggest that the price reaction to equity issues is dependent on the ability of firms to signal their value and intent. For example, firm-specific characteristics such as high levels of capital spending may signal the presence of strong investment opportunities (e.g., Ambarish, John, and Williams (1987), Cooney and Kalay (1993)), while other characteristics such as high operating risk may indicate low debt capacity. These characteristics, therefore, can condition investors to believe that equity is a rational funding choice (see Bayless and Chaplinsky (1991)). Myers and Majluf (1984) argue that the price reaction to equity issues and therefore information costs will be lower for firms with characteristics that lead investors to believe the issue is motivated for reasons other than overvaluation of the issuer's shares. Hence, the influence of firm characteristics on announcement date prediction errors suggests that hot and cold markets could result from the clustering of certain types of firms in high and low volume periods.

Our evidence indicates that otherwise *identical firms* experience lower prediction errors on average in hot markets compared to cold and normal markets. Importantly, the observed differences in prediction errors are not attributable to differences in market or macroeconomic conditions. Thus the results suggest that the use of volume to define hot issue markets reveals other causes for windows of opportunity when information costs are reduced. The difference in announcement date prediction errors, which we estimate to be on the order of 200 basis points, is both statistically significant and economically important. The 200 basis point difference implies that a typical hot market issuer would

forego approximately \$13 million in additional equity value if it issued in a cold market instead. By comparison, the direct costs of equity issue for similar offers would typically be less than \$2 million (Hansen (1986)). Thus the large potential advantage of issuing in hot versus cold market provides strong motivation for managers' concerns about the timing of equity issues. The overall evidence we report is consistent with time-varying asymmetric information and supports the existence of windows of opportunity for seasoned equity issues.

The plan of the article is as follows. In Section I, we develop a simple model of the asymmetric information problem to define windows of opportunity and illustrate the nature of our empirical tests. In Section II, we define hot, cold, and normal equity issue markets and present evidence on announcement date prediction errors in these periods. In Section III, we examine how market and macroeconomic conditions and firm-specific characteristics change in hot and cold markets. In Section IV, we present regression analyses of whether windows of opportunity exist. Section V gives our conclusions.

I. Asymmetric Information Theory and the Rationale for Windows of Opportunity

In this section asymmetric information theory is used to motivate the "Street" view for the existence of windows of opportunity. While asymmetric information offers but one explanation for windows, there is considerable evidence that information costs are a significant cost of equity issue.² Thus we use information theory to formulate a plausible explanation for windows and to develop some testable predictions.

A. The Nature of the Asymmetric Information Problem

Models of asymmetric information assume that managers' private information gives them a superior ability to value their firm's common stock. This information advantage over investors creates an adverse selection problem since firms can exploit valuation errors on the part of investors. In response, investors view an equity issue announcement as tantamount to a release of bad news by the firm. This is a rational response by investors, but raises the cost of equity issue for firms that are not overvalued.

If managers possess private information about the firm's investment opportunities, then investors will adjust their valuation of the firm to account for the expected value of managers' private information. Thus, the observed market value of the firm, V_o , is equal to the value of the firm calculated from public

² Previous studies of announcement date prediction errors for seasoned equity issues include: Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelsen and Partch (1986), and Korajczyk, Lucas, and McDonald (1990). For a summary of the evidence on seasoned equity issues in general, see Eckbo and Masulis (1993).

information that is common knowledge to all, V_c , and the expected value of managers' private information, $E(V_p)$.

$$V_o = V_c + E(V_p) \quad (1)$$

The intrinsic, or true value of the firm, V_τ , is equal to the value estimated from common knowledge and the true value of managers' private information, ${}^\tau V_p$:

$$V_\tau = V_c + {}^\tau V_p \quad (2)$$

Firms are over (under) valued if $E(V_p)$ is greater (less) than ${}^\tau V_p$.

In models of asymmetric information, investors revise downward their estimate of $E(V_p)$ when firms announce security issues (Myers and Majluf (1984) or Miller and Rock (1985)). Therefore, $E(V_p)$ is a function of the firm's actions, α , so that $E(V_p) = V_p(\alpha)$. Investors' revised estimate of the value of private information that results when the firm announces an equity issue may be expressed as:

$$\Delta E(V_p) = E(V_{p-\text{no issue}}) - E(V_{p-\text{issue}}) > 0.$$

Adverse selection costs of issue arise when investors' revised estimate of private information is less than the intrinsic value.³ In this case, assuming that the firm issues equity at $E(V_{p-\text{issue}})$, the decision to issue equity results in a loss in firm value equal to ${}^\tau V_p - E(V_{p-\text{issue}})$. Firms can reduce or avoid this loss by financing projects with internal funds, issuing debt, or by timing equity issues for periods when the asymmetric information problem is less severe. The last alternative, timing, is the principal focus of our analysis.

B. Strategies for Reducing Adverse Selection Costs

Myers and Majluf (1984) suggest two ways that the costs of adverse selection may be reduced. First, firms may experience lower adverse selection costs if investors interpret the equity issue decision favorably. Myers and Majluf (1984) argue that firm-specific or macroeconomic conditions can affect investors' interpretation of the motivation to issue. For example, firms that appear to have an attractive investment project because of strong capital spending (Cooney and Kalay (1993)) experience reduced announcement date prediction errors.

Myers and Majluf (1984) also suggest that adverse selection costs can vary if the discrepancy between managers' and investors' information varies over time. Consider the case in which the information sets available to investors and management are identical. In this symmetric information environment, $E(V_p) = {}^\tau V_p$ and the change in $E(V_p)$ due to an equity issue is zero. If investors

³ If the revised estimate of private information is not less than the intrinsic value, then no adverse selection costs are incurred, because the bad news that led investors to make their downward revision of estimated firm value would eventually become known anyway (see Korajczyk, Lucas, and McDonald (1990)).

know what management knows, then equity issues are not informative and both investors and managers place similar values on the firm.⁴ Intertemporal variation in the level of asymmetric information has not been formally modeled, but intuition suggests that periods of relative informational symmetry could occur when events known by both managers and investors dominate firm value. Such a possibility is envisioned in Berkovitch and Narayanan (1993), for example, where the net present value of investment projects have cyclical and idiosyncratic factors that vary in importance over time.

The arguments of Myers and Majluf (1984) suggest that the $\Delta E(V_p)$ observed at the announcement of an equity issue is dependent on firm characteristics Φ , market characteristics μ , and the level of asymmetric information Λ , at the time of issue (t):

$$\Delta E(V_p) = E(V_{p-\text{no issue}}) - E(V_{p-\text{issue}}) = \gamma(\Phi; \mu, \Lambda_t).^5 \quad (3)$$

Windows, as defined here, are independent of firm characteristics and result when macroeconomic and market conditions influence investors to more readily accept equity or when the level of asymmetric information is reduced. Thus, we define a window of opportunity as a time period t such that $\Delta E(V_p)$ is reduced for *all* firms relative to other times. This approach is similar to Kim and Stulz (1988) who examine whether there are periods when announcement date prediction errors are more favorable for Eurobond issues.

Evidence that macroeconomic conditions might contribute to windows is reported in Choe, Masulis, and Nanda (1993) where announcement date price reactions are less negative for equity issues announced during business cycle expansions. This result is consistent with investors being less concerned about overvaluation during these periods—perhaps in part because firms have more valuable projects in expansions or a greater portion of firm value is attributable to information shared by both management and investors. The question arises, however, whether in addition to the effects of macroeconomic conditions, prediction errors are lower in hot issue markets due to reduced levels of asymmetric information.⁶

⁴ Negative announcement date price reactions are still possible, even with symmetric information if investors disagree with the decision to issue.

⁵ The effects of Φ , μ , and Λ on $\Delta E(V_p)$ are likely to be interrelated. For example, if information is perfectly symmetric ($\Lambda = 0$) then $\Delta E(V_p) = 0$ for all values of Φ and μ . Therefore the effect of Φ and μ in equation (3) is dependent on the level of Λ . Our goal is to detect variations in $\Delta E(V_p)$ across time that are independent of variations in Φ . We do not include a time subscript on Φ to emphasize the relative stability of firm specific characteristics compared to market and macroeconomic conditions.

⁶ Korajczyk, Lucas, and McDonald (1991) provide evidence that the announcement date price reactions to equity issues are less negative when they follow firm-specific disclosures that reduce managers' informational advantage over investors, but they do not investigate more macro related timing.

C. The Role of Aggregate Equity Issue Volume

We use the aggregate volume of equity issues to identify the periods where the information costs of issue might vary in the extreme. If information costs are a significant deterrent to equity issue, then reductions in adverse selection costs should stimulate firms to issue equity. An important advantage of using issue volume is that macroeconomic conditions become exogenous determinants of windows of opportunity. This increases the generality of the empirical analysis because the role of macroeconomic factors as a potential explanation for the variation in information costs can be examined directly. Similar to existing studies we use the two day cumulative announcement date prediction error ($\text{CAPE}(-1, 0)$) as a proxy for information costs. Our tests hold constant common knowledge determinants of firm value and then examine whether the price reaction to equity issues *differs in periods of high or low issue volume*. Ceteris paribus, a finding of lower average price reactions to equity issues in high volume periods is consistent with reduced information costs in these periods.

There are, however, some important caveats about the use of the $\text{CAPE}(-1, 0)$ as a measure of information costs and the use of aggregate equity issue volume as a means to identify the hot and cold periods. First, the magnitude of information costs is difficult to assess because the $\text{CAPE}(-1, 0)$ can reveal information on the true value of the firm or other factors that affect equity value, such as price pressure (see Korajczyk et al. (1990)). Thus our results provide only indirect evidence on the role of information costs. Second, while there is considerable evidence consistent with information costs being an important cost of equity issue, they are not the only factor driving intertemporal variation in equity issue volume. Although theory offers less guidance here, hot market periods could be periods of reduced equity risk premia and falling discount rates (time-varying risk premia.) Further, herding and fad-based behavior provide an explanation for the increased volume in hot periods that is unrelated to information (or other issue) costs. Our inability to control for these and other yet unidentified determinants of equity issue volume results in our "hot" and "cold" issue markets being defined with some noise. This imprecision reduces the observed variation in announcement date prediction errors across actual periods of varying information costs and works to obscure the link between firm and market characteristics and windows of opportunity. In other words, the "noise" makes it harder to find evidence in support of windows of opportunity.

II. Methodology and Data

A. Identification of Hot, Cold, and Normal Markets

We define hot and cold issue markets using aggregate equity issue volume data from 1968 to 1990 obtained from the Federal Reserve System's *Annual Statistical*

Digest.⁷ Aggregate data allow for a longer time period to be considered than our sample of issues permits, thereby producing classifications which reflect a wider range of economic conditions. The use of volume to identify the periods of favorable and unfavorable issue conditions differs from Ritter (1984), where hot IPO markets are defined as periods of high initial returns and Choe et al. (1993), where hot markets are defined based on National Bureau of Economic Research (NBER) business cycle data.⁸ We classify the periods using three definitions of issue volume: nominal dollar, real dollar, and scaled issue volume. Real dollar volume is monthly nominal issue volume (\$ billions) deflated by the monthly Consumer Price Index (CPI). Scaled issue volume is monthly nominal issue volume (times 10^5) divided by the total month-end value of outstanding equity (from the Center for Research in Security Prices (CRSP)) for American Stock Exchange, New York Stock Exchange, and Nasdaq firms.

We rank a three-month moving average of equity issue volume into quartiles. High volume issue periods (HOT) are at least three contiguous months where equity volume exceeds the upper quartile. Low volume issue periods (COLD) are at least three contiguous months where issue volume falls below the lower quartile. We use the offers falling between the upper and lower quartile cutoffs as the benchmark for normal (NORMAL) periods.⁹ Although we later relax this assumption, initially hot and cold markets are defined for contiguous month periods because the duration of market conditions affects the firm's ability to issue in response to favorable conditions. For example, Mikkelsen and Partch (1986) report that a typical equity issuer spends 27 trading days between the registration date and offer date, and this does not include the time spent prior to registration, planning the issue.

The hot, cold, and normal classifications are not sensitive to the definition of issue volume. Greater than 90 percent of the months receive the same classification regardless of which definition of issue volume is used. Since scaled issue volume controls for changing price levels and the growth in the corporate sector over time, we present our evidence for this series. Figure 1 plots a three month moving average of scaled issue volume in relation to the upper and lower quartiles. Based on scaled volume, the following calendar time intervals are defined as hot and cold (lower quartile cut-off = 0.50, upper quartile cut-off = 1.26).

⁷ We define periods based on successfully completed issues to avoid the appearance of a hot market created by a high volume of announced issues followed by the subsequent withdrawal of many issues.

⁸ Loughran and Ritter (1995) suggest that the long-run underperformance of seasoned equity issuers is consistent with firms taking advantage of "transitory windows of opportunity." But they do not otherwise define windows.

⁹ Some judgment entered into the definitions of hot and cold period due to the requirement that the periods be contiguous months. This judgment is most apparent in the third cold market where essentially three cold periods have been combined into one. None of the subsequent results is affected by the treatment of these three periods as one.

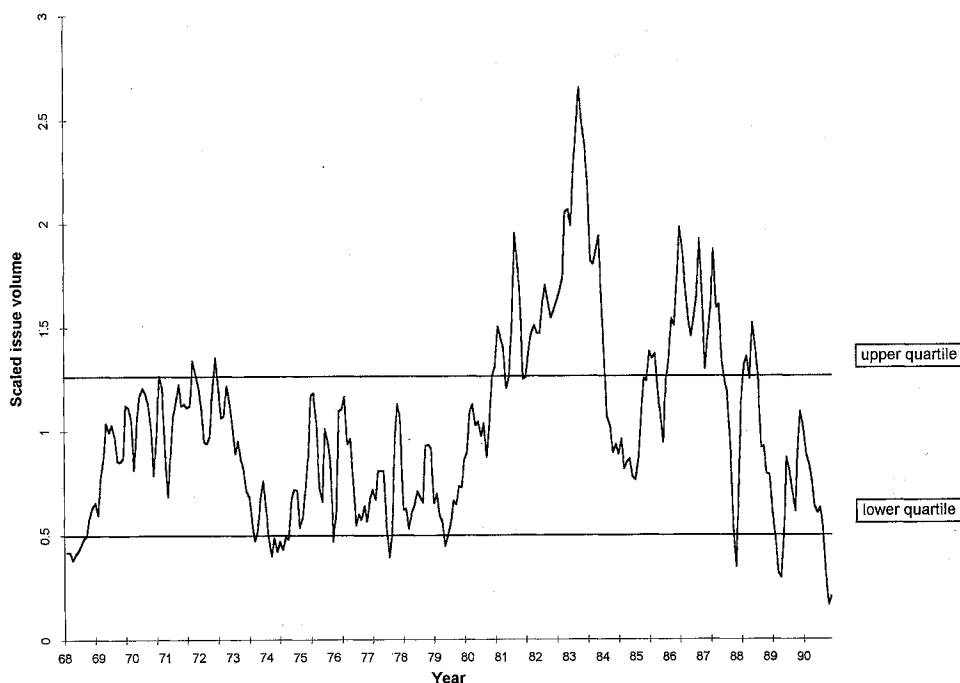


Figure 1. Hot and Cold Equity Issue Markets. Hot and Cold market classifications are based on quartile rankings of a three month moving average of scaled issue volume. Scaled issue volume is aggregate equity issue volume (\$ billions) multiplied by 100,000 and divided by the month-end value of outstanding equity for NYSE/AMEX and Nasdaq firms from 1968–1990. Equity issue data are from the Federal Reserve, *Annual Statistical Digest*, and outstanding equity value is from the Center for Research in Security Prices (CRSP). HOT markets are at least three contiguous months where scaled issue volume exceeds 1.26. COLD markets are at least three contiguous months where scaled issue volume falls below 0.50.

Market Classifications and Duration (in months)

COLD	03/68–02/69	11
COLD	08/73–02/75	19
COLD	09/76–09/79	37
HOT	11/80–02/84	40
HOT	07/85–08/87	27
HOT	04/88–09/88	6
COLD	02/89–10/89	9
COLD	05/90–12/90	8

From a historical perspective, cold markets occur at both the beginning and end of the sample period, while all of the hot markets occur during the 1980s. In total, 53 percent or \$224.3 billion of a total \$422.3 billion in equity is raised in hot markets, which comprise only 25 percent of the sample months (73 of 288 months.) \$60.7 billion in equity is raised in cold markets, while the remaining \$137.2 billion is raised in normal markets.

Table I

Cumulative Announcement Date Prediction Error, CAPE(-1, 0), for Seasoned Equity Issues in HOT, COLD, and NORMAL Markets

Prediction errors are computed for day t , as the return on stock i minus the return on the market, where day 0 is the announcement date of the equity issue. HOT, COLD, and NORMAL markets are determined from quartile ranks of a three month moving average of scaled equity issue volume from 1968–1990. HOT markets are at least three contiguous months where equity volume exceeds the upper quartile cutoff. COLD markets are at least three contiguous months where issue volume falls below the lower quartile cutoff. NORMAL markets are the months falling in between the upper and lower quartile cutoffs.

		HOT	COLD	NORMAL
Panel A: All Equity Issues				
01/74–12/90	Mean	-2.0%	-3.3%	-2.5%
	Median	-2.0	-2.9	-2.3
	% positive	28.8	18.7	26.9
	t : Mean = 0	-15.9*	-13.3*	-12.0*
	t : HOT - COLD = 0		4.4*	
	t : HOT - NORMAL = 0			1.13
	N	1125	288	471
Panel B: Individual Hot and Cold Markets				
01/74–02/75	Mean		-5.2%	
	t : Mean = 0		-4.1*	
	N		16	
09/76–09/79	Mean		-3.6%	
	t : Mean = 0		-9.9*	
	N		130	
11/80–02/84	Mean	-2.3%		
	t : Mean = 0	-14.5*		
	N	706		
06/85–08/87	Mean	-1.3%		
	t : Mean = 0	-4.1*		
	N	373		
04/88–09/88	Mean	-1.9%		
	t : Mean = 0	-3.7*		
	N	84		
02/89–10/89	Mean		-2.7%	
	t : Mean = 0		-6.4*	
	N		86	
05/90–12/90	Mean		-2.5%	
	t : Mean = 0		-4.9*	
	N		56	

* = p -value < 0.01, ** = p -value < 0.05, and *** = p -value < 0.10.

B. Offer Data

The offer data for this study are 1881 seasoned issues of common equity from 1974 through 1990 that are obtained from Securities Data Corporation (SDC). The sample is limited to industrial firms (no financials or utilities) and excludes preferred stock, convertible securities, and private placements. To be included in the final sample of 1881, issuers are restricted to having data available on both CRSP and COMPUSTAT.

C. Announcement Date Prediction Errors for Hot, Cold, and Normal Issues

Table I presents the two-day cumulative average prediction error, $CAPE(-1, 0)$, for the total sample of equity issues in hot, cold, and normal markets. Prediction errors are computed using net of market returns (i.e., for day t , the return on stock i minus the return on the market.) On average, the $CAPE(-1, 0)$ is -2.0 percent for hot market issues, -3.3 percent for cold market issues, and -2.5 percent for normal market issues. The $CAPE(-1, 0)$ is significantly different between hot and cold market issues but does not vary significantly between hot and normal market issues.¹⁰ Hence, the results indicate that hot market issuers receive a more favorable response on average to an equity issue than cold market issuers.

To investigate the consistency of this result over time, we also report the $CAPE(-1, 0)$ for each of the individual cold and hot issue markets. As shown in Panel B of Table 1, the $CAPE(-1, 0)$ is more negative, on average, in each cold market than in each hot market. In particular, the $CAPE(-1, 0)$ of -2.5 percent for the most recent cold period (05/90-12/90) is nearly twice that of the most favorable hot market (06/85-08/87). This evidence suggests that the overall results do not depend on any one period.

As noted earlier, however, with the exception of the cold markets in 1989 and 1990, all of the cold markets occur before 1980, while all of the hot markets occur during the 1980s. Evidence in Table I points to an apparent reduction in announcement date prediction errors over time as the $CAPE(-1, 0)$ fall from -5.2 percent on average in the early 1970s to approximately half of that in the late 1980s. Since many factors have changed over the course of two decades including the growth in institutional trading and the regulation of security

¹⁰ CAPE are also estimated using the market model, but the results are similar to the net of market returns. Announcement dates for the pre-1984 equity offers are from the *Wall Street Journal Index (WSJI)*. For these offers, the CAPE are computed for day -1 and day 0. Thereafter, we use the registration dates for the offerings and calculate announcement date prediction errors for day 0 and day +1. However, our results are insensitive to the use of a three-day window, $CAPE(-1, 0, +1)$. For expositional ease, we refer to all announcement date returns as $CAPE(-1, 0)$ in the text. To determine the effects of using registration dates, we collected announcement dates from *NEXIS* for offers in 1989 and compared the $CAPE(0, +1)$ based on announcement dates and registration dates. For the 50 offers for which we have both dates, the CAPE average -2.73 percent for announcement dates and -2.60 percent for registration dates. From SDC we have registration dates for 113 offers in 1989, which have a CAPE of -2.65 percent. Thus, the use of registration dates after 1984 does not appear to affect our results, but allows for the use of a larger sample.

Table II

Three Month Moving Average of Aggregate Equity Issue Volume in Scaled Dollars for Calendar Time Periods Designated as HOT, COLD, and NORMAL and Selected Macroeconomic and Market Conditions

Scaled issue volume = nominal issue volume \times 100,000 \div the month-end value of outstanding equity of NYSE/AMEX and Nasdaq firms. Δ S&P 500 is the average level of Standard and Poor's 500 Stock Index (S&P 500) in the 3 months prior to issue \div the prior 36 month average for the Index; Δ PE_RATIO is the 3 month average of PE_RATIO \div the prior 36 month average of PE_RATIO; Δ LEAD is the average level of the Index of Leading Indicators in the 3 months prior to issue \div the prior 36 month average for the Index; TBILL is the 3 month U.S. Treasury rate; TERMPREM is the 10 year U.S. Treasury rate - the 3 month U.S. Treasury rate; DEFPPREM is the Baa new issue rate - 10 year U.S. Treasury rate; and EQRATIO is equity issue volume \div the sum of equity and debt issue volume. All interest rates are computed from month-end averages of the rates in the 3 months prior to issue.

	SCALED VOLUME	EQRATIO	Δ S&P500	Δ PE RATIO	Δ LEAD	TBILL	TERM PREM	DEF PREM
Hot markets (73 months)	1.60	31.73%	1.17%	1.15%	1.05%	8.93%	1.81%	2.46%
11/80-02/84	1.71	42.81	1.13	1.13	1.03	11.16	1.38	2.32
06/85-08/87	1.50	18.54	1.26	1.23	1.07	6.18	2.26	2.43
04/88-09/88	1.26	17.33	1.06	0.92	1.05	6.61	2.61	2.14
Cold markets ^a (84 months)	0.64*	22.01*	1.01*	0.85*	1.04**	7.05*	0.74*	1.51*
01/68-02/69	0.53	28.60	1.09	1.04	1.05	5.47	0.32	1.29
08/73-03/75	0.55	17.68	0.87	0.69	1.00	7.64	-0.45	1.76
10/76-09/79	0.68	24.23	1.04	0.90	1.07	6.86	1.45	1.40
02/89-10/89	0.68	12.03	1.15	0.82	1.03	8.19	0.44	1.60
05/90-12/90	0.41	6.49	1.18	1.12	1.01	7.74	1.47	2.00
Normal markets (131 months)	0.97*	27.01**	1.06*	0.99**	1.04	6.52*	1.43	1.84*

^a Significance level of *t*-test for difference in HOT months versus other samples: * = *p*-value < 0.01, ** = *p*-value < 0.05, and *** = *p*-value < 0.10.

markets, this raises the concern that the results in Table I could reflect a time trend in the CAPE(-1, 0). In light of this, we examine whether the differences in the CAPE(-1, 0) uncovered for the full sample continue to hold in more recent periods. We break the sample into an early period (1974-1982) and a late period (1983-1990) and separately determine the hot and cold market classifications using quartile rankings of scaled issue volume for each period. For the early period, the CAPE(-1, 0) is -3.6 percent in cold markets versus -2.3 percent in hot markets, a difference which is significant at the 6 percent level. For the late period, the CAPE(-1, 0) is -2.9 percent in cold markets versus -1.8 percent in hot markets, a difference which is significant at the 1 percent level. Consequently, the results in Table I are not attributable to a time trend in the CAPE(-1, 0) over the sample period.

The results reported in Table I—that announcement date prediction errors are lower on average in hot markets than in cold markets—are consistent with variations in adverse selection costs over time. However, the difference in the $\text{CAPE}(-1, 0)$ could result from variations in the characteristics of issuing firms rather than from windows of opportunity. Additionally, windows of opportunity can result if macroeconomic conditions influence investors to more readily accept new seasoned equity. Therefore, in the next section we investigate the extent to which changes in market conditions and firm-specific characteristics, in hot and cold markets, can explain the differences in the $\text{CAPE}(-1, 0)$.

III. Market and Firm-Specific Characteristics in Hot and Cold Markets

A. Market Characteristics and Macroeconomic Conditions

Because market and macroeconomic conditions at the time of issue can affect investors' estimates of the probability of overvaluation, they are likely to influence the price reaction to equity issue announcements (see Bayless and Chaplinsky (1991), or Choe, Masulis, and Nanda (1993)). In Table II we report evidence on market and macroeconomic conditions in hot, cold, and normal markets. If the lower $\text{CAPE}(-1, 0)$ reported in Table I for hot markets is due to favorable economic conditions, then we would expect market conditions to be consistently more favorable on average (indicative of more or higher valued projects) in hot markets. We use measures of the S&P 500 Stock Index ($\Delta\text{S\&P 500}$), the price-earnings ratio for the S&P 500 Index ($\Delta\text{PE_RATIO}$), the Index of Leading Indicators (ΔLEAD), and the term premia (TERMPREM) (Fama and French (1989)) as proxies for aggregate economic conditions. The first three change variables are the average level of the variable in the 3 months prior to issue relative to the average value of the variable in the last 36 months.¹¹ For the entire sample, the higher values for $\Delta\text{S\&P 500}$ and $\Delta\text{PE_RATIO}$ in hot markets suggest that these markets are typically characterized by significantly higher near term increases in equity value and stronger business conditions than either cold or normal markets. This evidence is consistent with the findings of Moore (1980), Hickman (1953), and Choe, Masulis, and Nanda (1993) which document that equity issues cluster in business cycle expansions.

To examine whether preferences change for equity and debt financing, we present evidence on the corporate default premium (DEFPREM), measured as the difference between the Baa corporate bond rate and the 10 year U.S. treasury rate, and EQRATIO , the ratio of aggregate equity issue volume to the total aggregate volume of equity and debt issues. On average, DEFPREM is significantly higher in hot markets than in cold and normal markets. The widening of the default premium in hot markets is consistent with greater concerns in the aggregate for bankruptcy related risks. All else equal, such

¹¹ The results are not sensitive to whether 12 or 24 months are used as the benchmark.

concerns would provide a motivation for equity issue and decrease the attractiveness of debt issue. However, the high default premium is somewhat at odds with the evidence of strong economic performance in hot markets and suggests that other factors in addition to the business cycle are likely to provide important motivations for issue. Additional evidence of preferences shifting toward equity in hot markets is that EQRATIO averages 31.73 percent in hot markets compared to 22.01 percent in cold markets and 27.01 percent in normal markets.

If macroeconomic conditions are the primary cause of the lower CAPE($-1, 0$) in hot markets, then it seems reasonable to expect that the underlying economic conditions in these periods should be consistently favorable too. We therefore examine the market and macroeconomic variables in each of the individual hot and cold markets searching for such a pattern. With the exception of the default premium (which is higher in all hot markets), no other macroeconomic or market variable consistently distinguishes hot and cold issue markets. For example, Δ S&P 500 indicates that the S&P 500 Index is up 6 percent in the last three months for hot market (04/88–09/88), but this is considerably less than the increase observed in the last two cold markets. Also, the results for EQRATIO do not indicate that the proportion of equity financing increases consistently in hot markets as the high average EQRATIO for the full sample is primarily attributable to the period 11/80–02/84 with a ratio of 42.81 percent. More often than not, periods selected by high equity volume appear to be hot financing periods in which the total volume of debt and equity increases and EQRATIO is little changed.

The overall evidence in Table II fails to uncover a characteristic set of macroeconomic factors that can be reliably associated with hot and cold issue markets. The lack of consistency in the market and macroeconomic variables is noteworthy because it stands in sharp contrast to what appears to be a “systematic” shift in the CAPE($-1, 0$) across hot and cold issue markets. However, it should be stressed that these results do not imply that macroeconomic factors are an unimportant influence on investors’ expectations of the motivation to issue. Indeed the significant differences in economic conditions in hot and cold markets amply demonstrate the need to control for the influence of market and macroeconomic conditions on the announcement date prediction errors.

B. Issue Volume versus Macroeconomic Indicators as the Selector of Hot and Cold Markets

Previous studies tend to associate cold periods with recessions and classify their periods based on macroeconomic conditions rather than issue volume. Hickman (1953), Moore (1980), and Choe, Masulis, and Nanda (1993) equate cold periods to NBER “peak to trough” periods or with movements in the Index of Leading Indicators. Studies by Fama and French (1989) and Friedman and Kuttner (1991) report that default premia are higher in “peak to trough” periods (recessions), whereas Table II indicates that DEFPREM is consistently

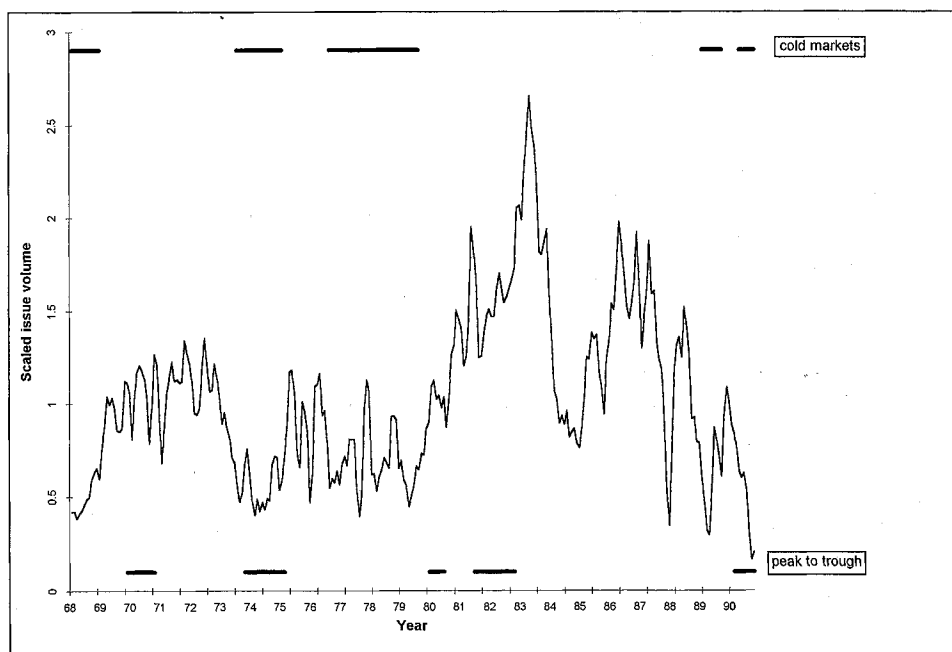


Figure 2. Cold markets in relation to NBER designated 'peak to trough' (recession) months. Cold markets are at least three contiguous months where the quartile rankings of a three month moving average of scaled issue volume fall below 0.50. Scaled issue volume is aggregate equity issue volume (\$ billions) multiplied by 100,000 and divided by the month-end value of outstanding equity for NYSE/AMEX and Nasdaq firms from 1968–1990. Equity issue data are from the Federal Reserve, *Annual Statistical Digest*, and the outstanding equity value is from the Center for Research in Security Prices (CRSP).

lower in cold markets as defined in this article. One explanation for the conflicting results is that the periods selected by equity issue volume differ rather markedly from those selected using macroeconomic criteria.

To illustrate, Figure 2 plots individual cold periods based on equity issue volume in relation to NBER "peak to trough" periods. With the exception of periods in 1974–1975 and 1990, there is no overlap between the months designated as cold based on issue volume and those based on NBER cyclical markers. In fact, cold market months coincide with only 38 percent of the "peak to trough" months (assuming all 63 recession months equal 100 percent.) Hot volume months (not shown) overlap only 28 percent of the time with "trough to peak" months. While the economic outlook is an important factor influencing issue, the lack of apparent overlap in the classifications suggests that there is not a simple and direct link between the business cycle and the decision to issue. Most importantly for our purposes, a reliance on macroeconomic factors to select the hot and cold markets omits potentially important information relevant to the decision to issue. Hence, an important advantage of the use of issue volume to select the periods is that it allows us to consider, but not be

constrained by, macroeconomic factors as we search for windows of opportunity.

C. Firm-Specific Characteristics

In this section we examine factors suggested by capital structure theory to influence investors' reactions to equity issue announcements. In Myers and Majluf (1984) investors use information about issuing firms to condition their assessment of the motivation to issue. Firms that issue in line with the predictions of capital structure theory are likely to be viewed by investors as having a reason for issue other than overvaluation. Consistent with this, Bayless and Chaplinsky (1991) use issuer characteristics that affect the relative cost of equity (e.g., risk, profitability, size, default premia, and asset tangibility) to accurately classify firms as either "debt type" (characteristic of typical debt issuers) or "equity type" (characteristic of typical equity issuers). They report that the price reaction to equity issues is less negative for "equity type" firms suggesting that investors perceive a reduced probability of overvaluation for these firms. These findings raise the possibility that the less negative CAPE(-1, 0) in hot markets could reflect fundamental shifts in firm characteristics toward "equity type" characteristics rather than windows of opportunity.

C.1. Investment-Related Demand for Equity

Flow of funds constraints motivate firms to issue equity when positive net present value investment projects cannot be financed internally (Fama and Miller (1972), Myers (1984)). Holding cash flows constant, equity issues could be motivated by the arrival of valuable investment projects. Alternatively, holding investment constant, equity issues could be motivated by low realizations of internally generated cash flow. Since these constraints suggest motivations for equity issue that are not based on overvaluation of the issuer's stock, investors may reduce the probability of overvaluation when issuers have a high demand for funds.

In Table III we measure the investment related demand for equity using free cash flow, return on assets, cash on hand, and capital expenditures for a period two years before to two years after the issue. Although we report the results only for the year of ($t = 0$) and year before ($t = -1$) issue, the results for other years do not alter our findings. Free cash flow is after tax operating and non-operating income minus capital expenditures, the change in net working capital, interest, and dividends. Cold market issuers have lower levels of free cash flow on average than hot market issuers. In the year of issue, free cash flow as a percent of assets (FCF) averages -4.8 percent for cold market equity issuers compared to -2.5 percent for hot market issuers, a difference which is significant at the 1 percent level. The difference in FCF appears to derive primarily from stronger capital spending as both the levels and growth rate in capital expenditures (CAPX) are higher, on average, for cold market issuers. Poor profitability does not account for the lower FCF, as the return on assets

Table III

**Firm-Specific Characteristics of HOT and COLD Equity Issuers
Related to the Motivation to Issue and Capital Structure**

Unless otherwise noted, variables are scaled by total assets (TA); $t = 0$ is the year of issue; FCF is pre-tax operating and non-operating income less taxes, net working capital (NWC), capital expenditures, interest, common and preferred dividends; ROA is pre-tax operating income before depreciation (OI); CAPX is capital expenditures; CASH is cash and marketable securities; LEVERAGE is long term debt (LTD) and short term debt (STD) \div the sum of LTD, STD, and the market value of equity (MVEQ); TARGET is the current year leverage ratio minus the 5 year average leverage ratio; QRATIO is the sum of MVEQ, the book value of debt and preferred stock \div total assets; SIZE is total assets; RISK is the error sum of squares \div total sum of squares from a market model regression of monthly stock returns for 48 months prior to issue; and PROCEEDS is the dollar value of equity issued \div total assets. $GR[-2,0]$ is the growth in the level of FCF, OI, or CAPX from year -2 to $0 \div$ total assets. P -value denotes significance level for t -test of equality of means in hot and cold markets.

	HOT	COLD	<i>P</i> -Value for <i>t</i> -Test of Equal Means
FCF(-1)	-3.3%	-2.5%	0.32
FCF(0)	-2.5	-4.8	<0.01
GR[FCF(-2,0)]	-2.4	-5.0	0.08
ROA(-1)	15.3	19.4	<0.01
ROA(0)	15.0	18.9	<0.01
GR[OI(-2,0)]	4.4	7.0	<0.01
CAPX(-1)	10.7	11.3	0.38
CAPX(0)	10.1	11.9	<0.01
GR[CAPX(-2,0)]	4.5	6.3	0.02
CASH(-1)	8.2	10.1	<0.01
CASH(0)	12.8	12.4	0.65
LEVERAGE(-1)	30.1	31.4	0.34
LEVERAGE(0)	23.7	26.0	0.09
TARGET	1.4	18.6	0.02
QRATIO(-1)	1.28	1.25	0.62
QRATIO(0)	1.34	1.33	0.94
SIZE(nominal \$M)	\$1181	\$409	<0.01
SIZE(constant \$M)	\$1185	\$501	<0.01
RISK	86.6%	87.9%	<0.01
PROCEEDS	24.8%	17.9%	0.05
No. Issues	1068	293	

is higher on average for cold market issuers in both years. Although cold period issuers have larger cash balances (CASH) than hot issuers in the year prior to issue, this difference disappears in the year of issue. Since FCF is the most comprehensive measure of a firm's ability to finance investment with internal funds, we place the greatest weight on it. Consequently, the evidence suggests that cold market issuers have less slack—owing to greater capital spending—than hot market issuers. Since these factors provide a motivation for equity issue other than overvaluation, all else equal, they should be associated with lower price reactions in cold markets.

C.2. Leverage Related Motivations for Equity Issue

We use the firm's leverage ratio and the deviation from its target leverage ratio, the intangibility (Myers (1977)) and risk of its assets, and firm size as indicators of the likelihood that firms are debt constrained and therefore likely to issue equity rather than debt (see Masulis (1988) for further discussion.) Most apparent in Table III is the marked difference in firm size (SIZE) between hot and cold market issuers. In constant dollars, an average cold market issuer has \$501 million in assets compared to \$1185 million for hot market issuers.¹² Firm size is likely to be positively related to debt capacity, thus the small average size of cold market issuers could suggest less ability to raise debt.¹³ Similarly, cold market issuers are further above their long-term leverage ratios when they issue (TARGET), use more leverage (LEVERAGE) in the year of issue, and are riskier (RISK) than hot market issuers. Since all of these factors suggest that cold market issuers are closer to exhausting their debt capacity than hot market issuers, they provide a motivation for equity issue that is less subject to concerns for overvaluation.

While cold market issuers have characteristics which, all else equal, should lead to lower price reactions, note that these firms actually choose to raise significantly lower amounts of equity as a percentage of total assets (PROCEEDS). Krasker (1986) argues that high adverse selection costs should cause firms to reduce their offering size. This suggests that the lower average offer size in cold issue markets could reflect management's awareness of high issue costs during these periods. In sum, the differences in firm characteristics suggest, *ceteris paribus*, that the price reaction should be less negative, on average, for cold market issues.¹⁴

¹² Constant dollar values exceed nominal dollar amounts because the CPI is indexed to 100 in 1983, and many of the issues in our sample occurred prior to that.

¹³ Cold market issuers appear to use little public debt. For offers occurring between 1974 and 1986, only 8.6 percent of cold market equity issuers also issue public debt in cold markets, 9.4 percent in normal markets, and 12.9 percent in hot markets. By comparison, 13.5 percent of hot market issuers issue public debt in cold markets, 22.8 percent in normal markets, and 27.6 percent in hot markets.

¹⁴ Logit analyses of hot and cold market issuers (not reported) also show that cold market issuers have characteristics that would tend to suggest less negative CAPE(-1, 0).

Table IV
Regression Analysis of Two-Day Average Announcement Date
Prediction Error, CAPE(-1,0), for HOT, COLD, and NORMAL
Market Equity Issues

Independent variables are: HOT, a dichotomous variable equal to one if issue takes place in a HOT market and zero otherwise; COLD, a dichotomous variable equal to one if issue takes place in a COLD market and zero otherwise; SCALED_VOL is a three month moving average of scaled equity issue volume; SCALED_VOL² is scaled issue volume squared; MKTRET(*t*) is the cumulative return on the Center for Research in Security Prices (CRSP) equal weighted index in the year prior to issue (*t* = -1) and the year post issue (*t* = +1); ΔLEAD is the 3 month average of the Index of Leading Indicators prior to issue ÷ 36 month average; DEFPREM is the Baa issue yield minus the 10 year U.S. Treasury rate, averaged for 3 months prior to issue; CAPE(-60, -2) is the cumulative prediction error from day -60 to day -2; PROCEEDS is the nominal dollar value of equity issued ÷ total assets; QRATIO is the market value of equity plus the book value of total debt and preferred stock ÷ total assets; SIZE is total assets; FCF is pretax operating and non-operating income - taxes - capital expenditures - interest - dividends ÷ total assets; and ROA is pretax operating income before depreciation ÷ total assets. Regressions are estimated using weighted least squares where the weight is the variance of the market model residuals. *t*-statistics are in parentheses.

	(1) 1974-1990	(2) 1974-1990	(3) 1974-1982	(4) 1983-1990	(5) 1974-1990
INTERCEPT	-4.23** (-1.96)	-4.37** (-2.02)	-11.01 (-2.61)	9.38 (1.73)	-10.30* (-3.58)
HOT	0.59** (2.13)	0.65** (2.34)	0.58 (1.39)	0.77*** (1.79)	
COLD	-0.95* (-2.81)	-0.89* (-2.61)	-1.67* (-2.63)	-1.29* (-2.50)	
SCALED_VOL					2.91* (3.41)
SCALED_VOL ²					-0.94* (-3.33)
MKTRET(-1)	-0.98** (-2.26)	-0.99** (-2.26)	1.44 (1.61)	-0.85 (-1.24)	-0.65 (-1.28)
MKTRET(+1)		-0.07 (-0.26)	0.34 (0.94)	-0.21 (-0.59)	-0.03 (-0.13)
ΔLEAD	3.84*** (1.92)	3.99** (1.98)	1.98 (0.52)	-0.08 (-1.50)	6.30* (2.81)
DEFPREM	0.05 (0.22)	0.07 (0.30)	0.68** (2.22)	-0.32 (-0.83)	0.52*** (1.84)
CAPE(-60, -2)	-1.95* (-3.16)	-2.04* (-3.28)	-2.74* (-2.68)	-1.38*** (-1.73)	-1.95* (-3.12)
PROCEEDS	-1.46*** (-1.92)	-1.60** (-2.06)	-1.05 (-0.62)	-1.50*** (-1.71)	-1.40*** (-1.80)
SIZE (0)*10 ⁻⁷	1.96 (0.83)	1.80 (0.76)	2.54 (0.84)	2.57 (0.67)	2.21 (0.94)
QRATIO (0)	0.39* (2.73)	0.35** (2.34)	0.23 (0.82)	0.28 (1.63)	0.34** (2.32)
FCF (0)	0.31 (0.34)	0.42 (0.44)	0.22 (1.27)	-0.03 (-0.03)	0.28 (0.30)
ROA (0)	-1.46 (-1.32)	-1.58 (-1.41)	5.94** (2.33)	-2.78 (-2.16)	-1.72 (-1.53)
ADJUSTED R ²	0.03	0.03	0.07	0.02	0.03
N	1359	1343	512	789	1343

* = *p*-value < 0.01, ** = *p*-value < 0.05, and *** = *p*-value < 0.10.

IV. Tests of Windows of Opportunity

A. Regression Analysis

In Table IV we estimate cross-sectional regressions designed to evaluate whether the $CAPE(-1, 0)$ are significantly different across the hot, cold, and normal markets, holding issuer and market characteristics constant. The regressions include as independent variables: *HOT*, a dichotomous variable equal to one if the issue takes place in a HOT market and zero otherwise; *COLD*, a dichotomous variable equal to one if the issue takes place in a COLD market and zero otherwise; $MKTRET(t)$, the cumulative return on the CRSP equally-weighted index in the year prior to issue ($t = -1$) or the year after issue ($t = +1$); $CAPE(-60, -2)$, the cumulative market adjusted returns for firm i from day -60 to day -2 ; and selected other firm and market characteristics. The regressions are estimated using weighted least squares where the weight is the variance of the market model residuals from regressions of 48 months of stock returns prior to issue.

The regression results for the full sample in Column (1) of Table IV indicate that when firm specific and market factors are held constant, the coefficient of *COLD* is negative and significant at the 1 percent level, while the coefficient of *HOT* is positive and significant at the 5 percent level. Consequently, the $CAPE(-1, 0)$ are significantly less negative on average in hot markets compared to other times. Further, as reported by Choe, Masulis, and Nanda (1993), macroeconomic conditions can significantly influence the information costs of issue. In particular the positive coefficient for $\Delta LEAD$ indicates less negative $CAPE(-1, 0)$ when business conditions are stronger. However, macroeconomic and market conditions do not tell the whole story and hence the use of volume to define hot issue markets reveals other potential causes for windows of opportunity. Consequently, the evidence suggests that hot markets offer favorable conditions for issue that are independent of macroeconomic and market conditions.

The results in column (1) are robust to many alternative specifications. As one example, in column (2) we include $MKTRET(+1)$ as an additional independent variable to show that even if investors possess perfect foresight about the market's future performance, the coefficients of *HOT* and *COLD* are little altered. With the exception of $MKTRET(-1)$,¹⁵ the other regression results are consistent with the findings of previous studies: the $CAPE(-1, 0)$ are negatively related to the preissue stock price runup and the amount offered (Bayless and Chaplinsky (1991), Masulis and Korwar (1986)) and are positively related to *QRATIO* (Denis (1994), Pilotte (1992), and Jung, Kim, and Stulz (1995)).

¹⁵ Masulis and Korwar (1986) and Choe et al. (1993) find a positive relation between the market runup in the three months prior to issue and the price reaction to equity issues. Our finding of a negative coefficient for $MKTRET(-1)$ is not due to both $MKTRET(-1)$ and $\Delta LEAD$ being in the same equation.

B. Sensitivity of Results to the Hot and Cold Market Classifications

The other specifications in Table IV investigate the robustness of the findings to the manner in which hot and cold markets are selected. In columns (3) and (4) the regression specification in column (2) is rerun for the early (1974–1982) and late (1983–1990) period, respectively. In these specifications the HOT and COLD indicator variables are separately determined for the early and late periods using quartile rankings of scaled issue volume. The early and late period results are similar to those reported for the full sample with the exception that the coefficient of HOT is no longer significant in the early period. Some loss of significance, however, is to be expected given the reduced sampling variation of the divided samples. Further evidence that the results capture something beyond a simple time trend is the finding that the magnitude of the HOT and COLD coefficients in column (4) actually increases in relation to the full sample results in column (2). With few exceptions, the coefficients of the other variables for the early and late periods are similar to those for the full sample. Thus the results indicate that the differences in hot and cold market price reactions are robust to the time period considered.

To this point our basic experiment has relied on contiguous month classifications of issue volume to identify the periods when the price reactions to equity issues might vary. This approach is intuitively appealing, but the contiguous month periods might capture influences on the $\text{CAPE}(-1, 0)$ other than changes in issue volume, which are less obviously related to changes in the cost of issue. That is, the results might be period specific rather than volume related. To examine this possibility, in column (5) we introduce a continuous measure of issue volume in lieu of the HOT and COLD dummies. SCALED_VOL is a three month moving average of scaled equity issue volume. To allow for any potential nonlinearity with respect to issue volume, we also include SCALED_VOL^2 . The coefficient of SCALED_VOL is positive and significant at the 1 percent level, indicating that the $\text{CAPE}(-1, 0)$ is less negative, on average, in the months where issue volume is heavy. In addition, the coefficient of SCALED_VOL^2 is negative and significant, suggesting that the $\text{CAPE}(-1, 0)$ becomes less negative at a decreasing rate as issue volume increases. The results support the connection between changes in volume and the observed changes in the $\text{CAPE}(-1, 0)$ and suggest that past some threshold volume, the decrease in the $\text{CAPE}(-1, 0)$ attenuates.¹⁶ Thus, equity issue remains costly even during the most favorable markets.

¹⁶ Given the coefficients of the volume variables, the quadratic specification yields an inflection point of 1.55 (2.91/(2*0.94)). This suggests that some very high issue volume periods have more negative $\text{CAPE}(-1, 0)$ than more moderate volume periods. Since the inflection point depends on the quadratic form, we estimate a regression with dummy variables that allow for further breakdown of the original HOT and COLD quartile classifications (e.g., top 10 percent, top 10 percent to 25 percent). Consistent with the results in column (5), the results indicate that the lowest volume months have the most negative $\text{CAPE}(-1, 0)$ and the least negative $\text{CAPE}(-1, 0)$ occur in moderately high volume months. Therefore, the best time to issue does not appear to be in the highest volume months.

C. Economic Significance

The coefficients in column (2) of Table IV suggests that there is approximately a 154 basis point disadvantage, on average, for firms issuing in cold markets relative to hot markets ($0.65 - (-0.89)$). However, this basis point difference is not likely to be fully revealing of the total cost differences because most hot market issuers never issue in cold markets—possibly because the costs are perceived to be prohibitive. To provide further illustration of the potential costs, we estimate the $\text{CAPE}(-1, 0)$ a typical hot market issuer would experience if it issued during a cold market instead.¹⁷ This estimate is derived by multiplying the coefficients in column (2) of Table IV by the weighted values for firm and market characteristics. Using this procedure, the expected $\text{CAPE}(-1, 0)$ for a hot market firm issuing in a cold market is -4.23 percent, which represents a 233 basis point differential above the -1.90 percent typically experienced by hot period issuers.¹⁸ In economic terms, the 233 basis point differential represents a 123 percent increase in the $\text{CAPE}(-1, 0)$ and implies that a typical hot market issuer would forego an additional \$15.8 million in equity value, on average, by issuing in a cold market.¹⁹

How large are the costs of “mistiming”? One can judge the importance of windows by comparing the 200 plus basis point difference to the direct costs of equity issue (gross spread and out-of-pocket expenses). Hansen (1986) estimates that the direct costs of underwritten equity offers range between 4 percent and 5 percent of gross proceeds for offers between \$20–\$100 million. A typical hot market issue with nominal dollar proceeds of \$30 million therefore incurs direct issue costs of between \$1.20 and \$1.50 million. Thus, the potential consequences of unfavorable market conditions are many times the direct costs of equity issue. Clearly, the difference in price reactions between hot and cold markets can have pronounced economic consequences for issuers.

¹⁷ Our approach assumes that an issuer sells equity at the price that prevailed immediately following the equity issue announcement. Our full sample experiences returns between the announcement and offer date that are 47 basis points, on average, above the market. Similar results are reported by Mikkelsen and Partch (1986). However, the assumption that the price is unchanged between the announcement and offer dates likely results in a lower bound estimate of the differences between hot and cold issues. The reason is that cold period issues lose ground from the announcement date to the offer date (-81 basis points relative to the market) while hot market issues experience positive returns during this period ($+155$ basis points relative to the market).

¹⁸ For consistency with the weighted least squares regressions reported in Table IV, we weight the means in Table III by the inverse of market model residuals from regressions of 48 months of stock returns prior to issue. The -1.90 percent is the announcement date prediction error for the sample of firms included in the regressions in Table IV. Incomplete financial statement data causes this sample to differ slightly from the sample reported in Table I.

¹⁹ In the present case we are interested in an estimate of the *increased* loss in firm value that hot market issuers would encounter if they issue in cold markets. The \$15.8 million loss in firm value is $(4.23 \text{ percent} - 1.90 \text{ percent}) \times (\text{average market value of equity})$. The average market value of equity is \$676 million for hot market issuers and \$310 million for cold market issuers.

D. Separate Regressions of Hot and Cold Issues

If the level of asymmetric information varies between hot and cold markets, then the response of investors to firm and market conditions is also likely to vary over time in a manner consistent with concerns for adverse selection costs. To examine this possibility, in Table V we report separate regressions of the $CAPE(-1, 0)$ for the hot and cold market issues in order to allow for differences in the slope of the regression line. The regression includes squared terms for $\Delta LEAD$, $DEFPREM$, and $PROCEEDS$ to ensure that the estimated slope coefficients are not affected by level differences in the independent variables between hot and cold markets.²⁰ Ignoring the squared terms, for hot issues only two variables, $MKTRET(-1)$ and $\Delta LEAD$, both macroeconomic and market condition variables, are statistically significant. Hence, the $CAPE(-1, 0)$ are not significantly affected by variables that contain firm-specific information about the issuer. By comparison, the same market condition variables plus $DEFPREM$ are significant for cold issues, but $CAPE(-60, -2)$, $PROCEEDS$, and $QRATIO$ are also significant. The latter variables all convey firm-specific information to investors. A Chow test (Chow (1960)) rejects at the 1 percent confidence level the hypothesis that the parameters of hot and cold market regressions are jointly equal. Tests of equality also reject the hypothesis that the coefficients of $MKTRET(-1)$, $DEFPREM$, $PROCEEDS$, and $QRATIO$ are the same in the hot and cold market regressions.²¹

Judging by the magnitude of the coefficients and t -statistics, firm-specific characteristics related to asymmetric information appear to have greater influence on announcement date prediction errors in cold markets than in hot markets. For example, the coefficients on $PROCEEDS$ suggests that the penalty for large offers is six times greater in cold markets than in hot markets (-18.12 versus -3.04). Similarly, the coefficient for $QRATIO$ is also significantly larger in cold markets (1.19 versus 0.28). Since $QRATIO$ is a proxy for firm quality, one interpretation of the positive coefficient is that a high $QRATIO$ provides greater market certification of project quality and management's competence in cold markets. Consequently, investors appear to place more weight on firm-specific factors in cold markets when asymmetric information could make discriminating between good and bad firms more important and more difficult. By contrast, investors appear to be less influenced by firm-specific information in hot markets. One explanation for this result is that a greater proportion of firm or project valuation is derived from information that is shared by both management and investors during these periods. Such an explanation would be consistent with reduced information costs in hot issue markets. Alternatively, the results are also consistent with herding theories to

²⁰ We estimated the regression with squared terms for all of the independent variables, but the more parsimonious specification reported in Table V yields similar results.

²¹ To test for differences in individual coefficients, we estimated a joint regression for hot and cold period samples and distinguished the samples using slope and intercept dummy variables. See Pindyck and Rubinfeld (1981) pp. 111–116 for a description of the use of slope dummy variables.

Table V

Comparison of Coefficients for Market Condition and Firm-Specific Variables for Separate Regressions of CAPE(-1,0) for HOT and COLD Issues

Independent variables are: MKTRET(*t*) is the cumulative return on the Center for Research in Security Prices (CRSP) equal weighted index in the year prior to issue (*t* = -1) and the year after issue (*t* = +1); ΔLEAD is the 3 month average of the Index of Leading Indicators prior to issue ÷ 36 month average; DEFPREM is Baa issue yield minus the 10 year U.S. Treasury rate, averaged for 3 months prior to issue; CAPE(-60, -2) is the cumulative prediction error from day -60 to day -2; PROCEEDS is the nominal dollar value of equity issued ÷ total assets; FCF is pre-tax operating and non-operating income - taxes - capital expenditures - interest - dividends ÷ total assets; ROA is pre-tax operating income before depreciation ÷ total assets; SIZE is total assets; and QRATIO is the market value of equity plus the book value of total debt and preferred stock ÷ total assets. ΔLEAD², DEFPREM², and PROCEEDS² are squared values of the above defined variables. Regressions are estimated using weighted least squares where the weight is the variance of the market model residuals. *t*-statistics are in parentheses. The *F*-statistic tests the null hypothesis that the hot and cold regressions are identical.

	HOT	COLD	<i>p</i> -value for Differences in Coefficients
INTERCEPT	-2.12* (-3.16)	1.04 (0.61)	
MKTRET(-1)	-1.65* (-2.47)	5.11* (2.69)	<0.01
MKTRET(+1)	-0.51 (-1.41)	0.18 (0.39)	0.32
ΔLEAD	3.87* (3.04)	-2.24 (-0.66)	0.12
DEFPREM	3.16 (1.23)	0.20* (3.22)	0.02
CAPE(-60, -2)	-0.98 (-1.44)	-3.16** (-2.11)	0.22
PROCEEDS	-3.04 (-1.47)	-18.12* (-3.57)	0.01
FCF (0)	0.04 (0.04)	1.39 (0.58)	0.64
ROA (0)	0.95 (0.59)	3.37 (1.13)	0.66
SIZE (0)*10 ⁻⁷	2.48 (0.87)	13.35 (-0.59)	0.62
QRATIO (0)	0.28 (1.42)	1.19* (2.77)	0.08
ΔLEAD ²	-1.78 (-2.94)	91.42 (0.57)	<0.01
DEFPREM ²	-0.57 (-1.21)	-6.20* (-2.98)	0.02
PROCEEDS ²	2.28 (0.87)	19.10* (2.59)	0.05
ADJUSTED <i>R</i> ²	0.03	0.16	
<i>F</i> -test of null hypothesis of identical regressions		2.60*	
N	764	215	

* = *p*-value < 0.01, ** = *p*-value < 0.05, and *** = *p*-value < 0.10.

the extent that investors suspend individual assessments of value in favor of a collective assessment of value during these periods.²² Overall, the analysis in Table V suggests that investor concerns about an issue are influenced by different factors in hot and cold issue markets in ways that are consistent with time varying asymmetric information.

E. Analysis of the Same Issuers over Time

The most important finding of this paper is that the announcement date prediction errors for equity offers vary across hot and cold issue markets in ways that cannot be explained by variations in firm or market characteristics. Taken literally, this implies movements in the $CAPE(-1, 0)$ over time for otherwise identical firms. As with any empirical analysis, however, the ability to interpret this result depends on the efficacy of the proxies used to capture firm and market characteristics. It is possible, for example, that investors react to factors that are not captured by the financial statement measures we employ. This is important because, as we have noted throughout the analysis, the failure to control adequately for firm characteristics could lead to erroneous conclusions about the existence of windows. Therefore, as a final check, we examine the $CAPE(-1, 0)$ after limiting our sample to firms that issue in both hot and cold markets (the "H-C" sample). This moves us closer to the ideal of examining "identical" firms but reduces the sample to 87 hot market, 73 cold market, and 35 normal market issues.

Similar to the results reported in Table I the mean $CAPE(-1, 0)$ for H-C issuers is -3.64 percent (median -2.89 percent) in cold markets and -1.38 percent (median -1.94 percent) in hot markets, a difference that is significant at the 1 percent level. When we estimate the same regression that appears in column (2) of Table IV for the H-C issues, the coefficient for HOT is not significantly different from zero, whereas the coefficient of COLD is -2.91 percent ($t = -2.89$). Otherwise, all of the market condition and firm characteristic variables are insignificant. These results increase our confidence that the differences in the $CAPE(-1, 0)$ between hot and cold markets are not attributable to changes in the composition of firms over time.

V. Conclusions

This article provides evidence that windows of opportunity exist when otherwise identical firms receive favorable prices for new seasoned equity. To produce our results we link the decision to issue with the costs of issue and define hot and cold issue markets based on aggregate equity issue volume. We find the average price reaction in hot markets is significantly less negative while the price reaction in cold markets is significantly more negative than at other times. The observed variation in the market reaction is not due to

²² We are not aware of a specific model of herding behavior that relates to security issuance. However, the general idea of herding theories is discussed in Bikchandani, Hirshleifer, and Welch (1992) and Welch (1992).

differences in firm or market characteristics across hot and cold markets, nor is it due to a time trend. Although there have been many changes in the equity markets over the nearly twenty-year period we examine, the results for more recent periods show larger differences in announcement date price reactions between hot and cold markets than those observed for the full sample. The differences in price reactions persist even when continuous measures of volume are used. We also report evidence that investors react differently to firm and market characteristics in hot and cold markets in ways that suggest greater concern for firm specific information, and indirectly asymmetric information, in cold markets. Taken together, these results are consistent with windows of opportunity for equity issue that result at least partially from reduced levels of asymmetric information.

Our results are also economically significant. We estimate that the cumulative announcement date prediction errors are reduced by 154 to 233 basis points, on average, if issuance occurs in a hot market rather than a cold market. In economic terms, this implies that a typical hot market issuer would forego up to 2.33 percent in additional equity value or approximately \$16 million if the issue took place in a cold market instead. Given that the direct costs of equity issue for the same issuer typically amount to less than \$2 million, this suggests that the windows of opportunity associated with high issue volume markets can have pronounced economic consequences for issuers. Consequently, our results lend strong support to managers' concerns about the timing of equity issues and to investment bankers' attempts to make market timing a more integral part of the equity issue decision.

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