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SB IPOs and IPO Anomalies: An Empirical Analysis of the Small Firm Uniqueness Hypothesis

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ABSTRACT

The purpose of this paper is to provide a direct test of the small-firm uniqueness hypothesis advanced by Ang (1991). We do this by using the SB-IPO program of the SEC as our instrument to define a small firm. Having identified small firms, we test the three IPO anomalies to see if small firms differ from large firms along these dimensions. We find that SB IPOs experience the three anomalies; however, they do so in disparate ways than mainline IPOs do. In sum, we provide support for the small firm uniqueness hypothesis.

JEL Classification: G24, G28, G38
Key words: IPO, Initial Public Offering, Anomalies, Small Firm Uniqueness, SB-2

I. INTRODUCTION

PRIOR STUDIES OF MAINLINE IPOS have demonstrated consistently that IPOs exhibit three primary "anomalies." First, in seminal papers, Logue (1973) and Ibbotson (1975) document that IPOs are underpriced on average. That is, the closing price soon after the IPO is significantly higher than the issue price for large samples over long periods of time. Second, Ritter (1991) and Loughran and Ritter (1995) documented the long-

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run underperformance of mainline IPOs based on risk-adjusted benchmarks. Third, Ibbotson and Jaffe (1975) and Ritter (1984) showed the existence of hot IPO markets based on underpricing and volume of issuance.

The purpose of our paper is to empirically test if these anomalies are robust to small firms. Our instrument for a small firm is a firm that chooses to file for its IPO using the SB-2 program (instead of the mainline S-1 program).[3] Our research question is of interest because extant literature argues that small businesses are unique (e.g., Ang, 1991; Timmons and Spinelli, 2007). By empirically examining the three IPO anomalies in SB-2 IPOs vis-à-vis S-1 IPOs, it is possible to explicitly test the small-business uniqueness hypothesis.

In the aggregate, we find support for the small-firm uniqueness hypothesis—small firms are different from large firms along many dimensions (Ang, 1991). We find that SB-2 IPOs differ along many dimensions from S-1 IPOs. For example, SB-2 IPOs tend to have less-prestigious auditors and underwriters. Finally, we demonstrate that while SB-2 IPOs appear to possess the same IPO anomalies that have been previously documented in the mainstream IPO literature, they do so in differing degrees. Surprisingly, SB-2 IPOs experience lower underpricing and at least as good long-run market-adjusted performance.

The remainder of the paper proceeds as follows. In the next section we develop the theoretical predictions driven from a review of the literature. The empirical work is detailed in the next section, consisting of Data, Empirical Methods, and Results. The final section concludes.

II. LITERATURE REVIEW, THEORETICAL DEVELOPMENT, AND TESTABLE HYPOTHESES

[3] A much lesser-known path to an IPO, designed specifically for small businesses is to file form SB-2 with the Securities and Exchange Commission (SEC). The 1992 SB-2 legislation was enacted for the specific purpose of giving small firms less restricted access to US capital markets by reducing the burden for registration and reporting. For a firm to qualify to use the SB-2 form it must be located in either the US or Canada and had less than $25 million in revenues in the last fiscal year. It also must have less than $25 million in public float.

The convergence of the small firm uniqueness hypothesis and entrepreneurial finance has not received much academic attention. We have found five papers that have at least partially tested what we examine in this paper. The research of Brau and Osteryoung (2001) and Brau and Gee (2010) both study micro-IPOs while Bradley, Cooney, Dolvin, and Jordan (2006) study penny-stock IPOs. These studies implicitly examine the small firm-uniqueness hypothesis, although they do not explicitly state this is what they are doing. Brau and Carpenter (2012a,b) study SB-2 IPOs as a proxy for small firms. In this paper, we employ the same data as Brau and Carpenter (2012a,b) but ask fundamentally different questions.

Brau and Osteryoung (2001) study SCOR prospectus companies. In the early 1980s, the Reagan administration initiated policies to remove regulatory burdens from small businesses in an attempt to make acquiring capital less costly (i.e., same intent as the SB-2 program). Brau and Osteryoung (2001) examine marketing mechanisms, expenses, ownership, governance, offering characteristics, business life stage, and signaling variables for 73 SCORs from the state of Washington. They find the number of directors, size of the largest block, and early-stage offers all impact the success of a SCOR offering.

Because SCORs do not have publicly-traded stock prices, Brau and Osteryoung (2001) define a successful offering as a firm that raised enough capital to break escrow. The limitations of non-public stock prices and unaudited financial statements prohibit the testing of the three IPO anomalies with the SCOR sample, and make the comparison with mainline IPOs very difficult. As a result, Brau and Osteryoung (2001) are not able to perform these tests. Our use of an SB-2 sample expands the research of small firm uniqueness by allowing us to perform this type of testing. In a follow-up study, Brau and Gee (2010) expand the study of SCORs to a national database.

In contrast to SCORs, Bradley et al. (2006) study publicly-traded penny stocks and, as such, can examine the traditional IPO anomalies and can compare penny-stock IPOs with mainline IPOs. Bradley et al. (2006) define a penny-stock IPO as:

> ". . . an issue that meets the following three criteria: 1) is not issued by an investment advisor (e.g., not a closed-end fund), 2) its offer price is $5 or less, and 3) is not listed on a national exchange or market . . . . Thus, we classify IPOs listed on the NYSE, AMEX, or Nasdaq National Market as 'ordinary' without regard to their offer prices. IPOs listed on other markets (such as the Nasdaq SmallCap Market, OTC Bulletin Board, pink sheets or regional exchanges) are classified as penny stocks if

> the offering is not issued by an investment advisor and the offer price is $5 or less."

By using this definition, Bradley et al. (2006) are able to examine the mainline (what they call "ordinary") IPO issues of initial returns (i.e., underpricing), long-run performance, lockup lengths, and underwriting gross spreads. The extant mainline IPO literature demonstrates that IPOs are consistently, on average, underpriced (e.g., see the seminal work of Logue (1973) and Ibbotson (1975)). Underpricing, as defined by this literature, is typically the first-day return of the stock. As for IPO long-run performance, many studies of mainline IPOs (e.g., Ritter (1991) and Loughran and Ritter (1995)) show that IPOs underperform on a risk-adjusted basis. Pertaining to lockup lengths, Field and Hanka (2001) show that lockup lengths for mainline IPOs have clustered on 180 days. Finally, Chen and Ritter (2000) document that underwriter spreads have clustered at 7% for mainline IPOs.

Bradley et al. (2006) find significant differences between penny-stock and non-penny-stock IPOs. For the period 1990–1998, penny-stock IPOs have higher underpricing, lower long-run stock returns, longer lockups, and larger gross spreads. Specifically, penny-stock IPOs experience an average underpricing of 22.4%, significantly greater than ordinary IPOs (15.4%) at a p-value of 0.0003. The three-year (five-year) market-adjusted returns for penny-stock IPOs is -101.8% (-126.4%) contrasted with -39.9% (-55.2%) for ordinary IPOs (both p-values <0.01). As for lockups, the average length of the 207 penny-stock IPOs with data is 452 days, compared to 180 days for ordinary IPOs. Finally, penny-stock IPOs group around a standard underwriter spread of 10%, whereas ordinary IPOs group at 7%.

In addition, the authors find penny-stock IPOs offered by underwriters who have undergone SEC enforcement actions have even higher underpricing (31.6%) and worse long-run returns (3-year = -131.8%, 5-year = -162.6%). Bradley et al. (2006) do not examine the issue of registration type (S-1 vs. SB-2). We believe our tests of the SB-2 program to be the first.

The mainline IPO literature has documented three traditional IPO anomalies: underpricing, long-run performance, and hot markets. In this section, we test to determine if these anomalies exist for SB-2 IPOs in an absolute and relative (i.e., to S-1 IPOs) framework. Continuing the purpose of testing SB-2 IPO quality vis-à-vis S-1 IPO quality, we test the following four hypotheses:

H1: SB-2 IPOs have significant, positive first-day underpricing which is higher than S-1 IPOs.
H2: SB-2 IPOs have significant, negative long-run stock price performance which is worse than S-1 IPOs.
H3: SB-2 IPOs delist for negative reasons more frequently than S-1 IPOs.
H4: SB-2 IPOs have significant market cycles which are more volatile than S-1 IPOs.

The data for underpricing, long-run returns, and delisting are taken from CRSP's daily stock return files. Frequency of IPO issuance is taken from SDC. Beatty and Ritter (1986) argue and demonstrate in a seminal empirical paper on underpricing that firms with greater uncertainty have higher underpricing. If SB-2s are riskier (i.e., lower quality) than S-1 IPOs, we expect H1 to hold. Beginning with Ritter (1991) the long-run stock performance of IPOs has been shown to be subpar, typically underperforming risk-adjusted or market benchmarks. If SB-2 IPOs are of lower quality (and if they are priced inefficiently at offering and by the initial market prices) then H2 follows. The delisting measure, H3, taken from Brau, Brown, and Osteryoung (2004), is an additional proxy for long-run outcome/performance. H4 is designed to test the hot market anomaly (e.g., Ritter, 1984).

III. EMPIRICAL WORK

A. Data

We employ the same data and methods used by Brau and Carpenter (2012a) who distinguish small firms as those that filed an IPO using the SB-2 form, and compare them to similar-sized companies that issued an IPO with the standard S-1 form.

Just as Brau and Carpenter (2012a), we begin with an initial sample of SB-2 and S-1 IPOs taken from the SDC's New Issues database issued between 1993 and 2007 (1993 was the first year with reliable SB-2 data and 2007 was the last year when an SB-2 IPO was filed) and combine this with return and financial data from the CRSP and Compustat datasets. We calculate abnormal returns (defined subsequently) from the CRSP data and gather pre-IPO revenues from the Compustat data. After removing all firms with more than $25 million in sales and excluding all financial firms we are also

left with 1,899 IPOs in our final sample with 1,356 S-1 IPOs and 543 SB-2 IPOs.[4] Tables I and II report the frequency distributions for the sample parsed on issue year and industry, respectively.

B. Empirical Methods and Results

We define *Initial Return* (short-term), our proxy for IPO underpricing, as the first-day return from offer price to closing price (Bradley et al. (2006)). The *One-Year Abnormal Return* (long-term) is the cumulative raw return, adjusted for the CRSP all-index value-weighted cumulative return (Loughran and Ritter (1995)). Table IV reports the descriptive statistics as well as difference tests for these variables. Compared to the S-1 pooled sample, SB-2 IPOs have an average (median) *Initial Return* of 15% (8%) while S-1 IPOs have an average (median) of nearly 37% (13%). The difference in means (medians) – 22% (-5%) is significant with a p-value of 0.0001 (0.0001).[5] The pair-matched results are very similar to these pooled results.

Using pooled data, the S-1 IPO *One-Year Abnormal Return* average (median) is -9.9% (-35%) compared to the SB-2 average (median) of -17.0% (-33.5%). The difference in means (-7.2%) is significant (p = 0.0845); however, the difference in medians (1.5%) is not significant (p = 0.8642). The pair-matched benchmark sample is not consistent with the pool-matched sample in this instance. Using pair-matched firms, SB-2 IPOs outperform S-1 IPOs in the mean (2.2%, p = 0.6631) and in the median (9.2%, p = 0.0062). Because of this inconsistency, we will rely on the subsequent ordinary least square (OLS) and two stage least square (2SLS) multivariate results before interpreting the long-run results.

In sum, using univariate analysis, H1 is rejected because SB-2 IPOs have *significantly less underpricing* than S-1 IPOs, contrary to predictions. The results for H2, long-run returns, are mixed.

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[4] We follow the same methods as Brau and Carpenter (2012a). See their data section for a detailed description of data collection.

[5] For a review of the IPO underpricing literature see Daily et al. (2003).

Table I. Sample Frequencies by Issue Year

Panel A: S-1 IPOs				
Issue	Pooled Sample		Pair-Matched Sample	
Year	Frequency	Percent	Frequency	Percent
1993	123	9.1	67	12.3
1994	106	7.8	45	8.3
1995	119	8.8	47	8.7
1996	201	14.8	71	13.1
1997	122	9.0	54	9.9
1998	72	5.3	30	5.5
1999	245	18.1	105	19.3
2000	205	15.1	79	14.6
2001	18	1.3	4	0.7
2002	5	0.4	2	0.4
2003	7	0.5	2	0.4
2004	40	3.0	12	2.2
2005	25	1.8	8	1.5
2006	30	2.2	4	0.7
2007	34	2.5	12	2.2
2008-11	4	0.3	1	0.2

Panel B: SB-2 IPOs				
Issue			Cumulative	Cumulative
Year	Frequency	Percent	Frequency	Percent
1993	82	15.1	82	15.1
1994	83	15.3	165	30.4
1995	100	18.4	265	48.8
1996	128	23.6	393	72.4
1997	64	11.8	457	84.2
1998	31	5.7	488	89.9
1999	15	2.8	503	92.6
2000	10	1.8	513	94.5
2001	4	0.7	517	95.2
2002	3	0.6	520	95.8
2003	4	0.7	524	96.5
2004	6	1.1	530	97.6
2005	2	0.4	532	98.0
2006	6	1.1	538	99.1
2007	5	0.9	543	100
2008-11	0	0.0	543	100

Table II. Sample Frequencies by Industry Group

Panel A: S-1 IPOs

	Pooled Sample		Pair-Matched Sample	
Industry	Frequency	Percent	Frequency	Percent
A	1	0.1	1	0.2
B	30	2.2	4	0.7
C	6	0.4	6	1.1
D	574	42.3	247	45.5
E	87	6.4	22	4.1
F	16	1.2	25	4.6
G	46	3.4	37	6.8
I	588	43.4	194	35.7
Missing	8	0.6	7	1.3

Panel B: SB-2 IPOs

Industry	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	1	0.18	1	0.2
B	4	0.74	5	0.9
C	6	1.1	11	2.0
D	247	45.49	258	47.5
E	22	4.05	280	51.6
F	25	4.6	305	56.2
G	37	6.81	342	63.0
I	194	35.73	536	98.7
Missing	7	1.29	543	100

Industry description	SIC Manual Division	Two-Digit Major Group
Agriculture, Forestry, and Fishing	A	01–09
Mining	B	10–14
Construction	C	15–17
Manufacturing	D	20–39
Transportation, Communications, Electric, Gas, and Sanitary Services	E	40–49
Wholesale Trade	F	50–51
Retail Trade	G	52–59
Finance, Insurance, and Real Estate	H	60–67
Services	I	70–89
Public Administration	J	91–97

Table III. Logit Model of SB-2 Versus S-1.
Dependent variable SB = 1 or SB = 0.

	Pooled		Pair-Matched	
	Estimate	*p*-value	Estimate	*p*-value
Intercept	1.97	0.0031	2.45	0.0022
Big Six	-1.02	0.0006	-1.22	0.0013
UW Rank	0.83	0.8524	-0.45	0.9293
log(Sales)	0.18	0.1472	0.62	<.0001
Cash Flow	0.03	0.4311	0.01	0.7914
Exchange	-0.72	0.0071	-0.87	0.0061
ROA	-0.03	0.5912	-0.04	0.5544
log(Age)	-0.04	0.7558	-0.15	0.3455
VC	-0.13	0.5260	-0.08	0.7680
Debt/Assets	0.01	0.8902	0.02	0.8853
Delaware Corp	-0.41	0.0313	-0.25	0.2864
Offer Size	-0.18	<.0001	-0.16	<.0001
Internet IPO	1.43	0.0047	1.67	0.0062
Dual Share Class	-0.31	0.6377	-0.63	0.4040
Lockup Length	0.005	<.0001	0.005	<.0001
Years	Yes		Yes	
Industry	Yes		Yes	
Psuedo R^2	65.1%		66.1%	

In order to more fully test *Initial Return* and *One-Year Abnormal Return* we estimate OLS and 2SLS regression models. Table V reports the results for *Initial Return* using the following OLS model:

$$\begin{aligned} \textit{Initial Return} = {} & \beta_1 SB + \beta_2 \textit{Big Six} + \beta_3 \textit{UWRank} + \beta_4 \textit{log(Sales)} + \beta_5 \textit{Cash Flow} + \beta_6 \textit{Exchange} + \beta_7 \textit{Overhang} + \beta_8 \textit{log(Age)} + \beta_9 \textit{VC} + \beta_{10} \textit{Debt/Assets} \\ & + \beta_{11} \textit{Delaware Corp} + \beta_{12} \textit{Internet IPO} + \beta_{13} \textit{Dual Share Class} + \\ & \beta_{14} \textit{Lockup Length} + \beta_{(\text{years})} \textit{Years}_{(1993\text{-}2007)} + \beta_{(\text{industries})} \textit{Industry}_{1(\text{A-I})} + \varepsilon. \end{aligned} \quad (1)$$

Table IV. Descriptive Statistics and Difference Tests of After-Market Returns

Panel A. SB-2 IPOs				
Variable	Mean	Median		
Initial Return	15.0%	8.0%		
1-Year Return	-17.0%	-33.5%		
Panel B. S-1 IPOs				
	Pooled		Pair-Matched	
Variable	Mean	Median	Mean	Median
Initial Return	36.9%	13.0%	36.8%	12.5%
1-Year Return	-9.9%	-35.0%	-19.2%	-42.7%
Panel C. Differences (SB-2 minus S-1)				
	Pooled		Pair-Matched	
Variable	Mean	Median	Mean	Median
Initial Return	-21.9%	-5.0%	-21.8%	-4.5%
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
1-Year Return	-7.2%	1.5%	2.2%	9.2%
	(0.0845)	(0.8642)	(0.6631)	(0.0062)

These variables are all defined in Appendix A. Bruton, Chahine, and Filatotchev (2009) show that owner retention significantly impacts entrepreneurial IPO underpricing. As such, we use *Overhang*, defined as shares retained divided by primary shares sold (Bradley and Jordan (2002)).

We estimate a two-stage model where the first stage contains a logit model modeling the choice of SB-2 or S-1. Several of the independent variables, as shown in Table III are significant including *Big Six, log(Sales), Exchange, Delaware Corp, Offersize, Internet IPO, and Lockup Length*. The purpose however, of the logit model is to estimate an *SB-hat* and then use it for the SB proxy variable in the OLS model with *Initial Return* as the dependent variable. As such, we will leave the inspection of Table III to the interested reader.

The primary variable of interest in Table V, Panel A is *SB*. The results indicate that we reject H1; SB-2s do not significantly under- or over-perform S-1 IPOs in the initial return. The OLS results seem to contradict the univariate results. However, Panel B, which removes the endogeneity of the SB-1 variable by using *SB-hat,* reports that in the pooled (pair-matched) benchmark sample, SB-2 IPOs have 2% (4%) less underpricing, both significant with *p*-values less than 0.0001. Thus, our univariate results are confirmed.

Table VI reports the results for the following model which tests H2, first using OLS with *SB* (Panel A) and then using 2SLS with *SB-hat* (Panel B):

$$\begin{aligned} &\textit{One-Year Abnormal Return} = \\ &\beta_1 SB + \beta_2 \textit{Underprice} + \beta_3 \textit{Big Six} + \beta_4 \textit{UW Rank} + \beta_5 \textit{log(Sales)} + \beta_6 \textit{Cash} \\ &\textit{Flow} + \beta_7 \textit{Exchange} + \beta_8 \textit{ROA} + \beta_9 \textit{log(Age)} + \beta_{10} \textit{VC} + \beta_{11} \textit{Debt/Assets} + \\ &\beta_{12} \textit{Delaware Corp} + \beta_{13} \textit{Internet IPO} + \beta_{14} \textit{Dual Share Class} + \beta_{15} \textit{Lockup} \\ &\textit{Length} + \beta_{16} \textit{Book/Market} + \beta_{(\text{years})} \textit{Years}_{(1993\text{-}2007)} + \beta_{(\text{industries})} \textit{Industry}_{1(\text{A-I})} + \varepsilon. \end{aligned} \quad (2)$$

All of these variables are defined previously, except for *Book/Market* equity, and *Underprice*. We add *Book/Market* following Barber and Lyon (1997) who show it is an important factor in explaining long-run IPO returns. *Underprice*, as defined above, is the first closing price divided by the offer price. In the 2SLS model, we also construct an *Underprice-hat* variable using the model in Equation 3. We include *Underprice* and *Underprice-hat* based on McConaughy, Dhatt, and Kim (1995) who argue that poor long-run IPO performance is due to investors who overpay.

The results in Table VI indicate that *SB* or *SB-hat* is only significant in the pair-matched 2SLS model (Panel B, last two columns). In general, the four models in Table VI indicate that SB-2 IPOs do not underperform S-1 IPOs over one year, and may even outperform them by 3%. Thus, we reject H2.

Table VII reports the frequency and various reasons that the companies in our sample were delisted. The statistics are for the first five years of a firm's life, so we include the IPOs in our sample from 1993 to 2004, which is 97.6% of the SB-2 sample, 93.2% of the pooled sample and 95.4% of the pair-matched sample. We do not include the later years of the sample because they do not have five years of life to

Table V. OLS and 2SLS Models of Underpricing

	Panel A. OLS Model: Initial Return				Panel B. 2SLS Model: Initial Return			
	Pooled		Pair-Matched		Pooled		Pair-Matched	
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
SB or SB-hat	-0.04	0.2342	-0.06	0.1638	-0.02	<.0001	-0.04	<.0001
Big Six	-0.05	0.2066	-0.07	0.1706	-0.07	0.0745	-0.12	0.0131
UW Rank	1.66	<.0001	1.84	0.0033	1.25	0.0005	1.15	0.0688
log(Sales)	0.02	0.233	0.02	0.3377	0.02	0.2525	0.02	0.2362
Cash Flow	0.002	0.4537	-0.0003	0.9497	0.005	0.0556	0.01	0.22
Exchange	-0.002	0.9669	0.01	0.8934	-0.02	0.5268	-0.04	0.3906
Overhang	0.04	<.0001	0.05	<.0001	0.04	<.0001	0.05	<.0001
log(Age)	0.004	0.8093	0.01	0.6035	0.01	0.6708	0.02	0.3636
VC	-0.004	0.89	-0.004	0.9224	0.004	0.8754	-0.0001	0.9976
Debt/Assets	-0.01	0.2371	-0.01	0.3962	-0.01	0.2328	-0.01	0.319
Delaware Corp	0.04	0.1483	0.03	0.4024	0.03	0.2527	0.02	0.6224
Internet IPO	0.23	<.0001	0.32	<.0001	0.25	<.0001	0.36	<.0001
Dual Share Class	0.01	0.9052	-0.07	0.5003	-0.02	0.7469	-0.11	0.297
Lockup length	0.0003	0.0056	0.0003	0.0218	0.0003	0.0004	0.0004	0.0007
Intercept	0.20	0.014	0.12	0.2864	0.14	0.0791	0.09	0.3951
Years	Yes		Yes		Yes		Yes	
Industry	Yes		Yes		Yes		Yes	
Adj R^2	17.2%	<.0001	13.3%	<.0001	18.6%	<.0001	15.6%	<.0001

Table VI. OLS and 2SLS Models of 1-Year Abnormal Return

	Panel A. OLS Model: 1-Year Return				Panel B. 2SLS Model: 1-Year Return			
	Pooled		Pair-Matched		Pooled		Pair-Matched	
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
SB or SB-hat	0.04	0.5709	0.09	0.1619	-0.0003	0.9665	0.03	0.0278
Underprice or Underprice-hat	-0.13	0.0138	-0.13	0.0157	0.39	0.2637	0.02	0.9516
Big Six	0.03	0.6456	-0.03	0.7317	0.05	0.5406	0.01	0.8893
UW Rank	1.08	0.1069	2.67	0.0037	-0.003	0.9974	2.72	0.0161
log(Sales)	0.03	0.3368	0.04	0.2785	0.01	0.6661	0.03	0.3753
Cash Flow	0.01	0.0359	0.01	0.0952	0.01	0.0461	0.01	0.2841
Exchange	0.11	0.1346	0.13	0.0536	0.09	0.1909	0.16	0.029
ROA	0.02	0.154	0.01	0.4062	0.02	0.1434	0.01	0.3557
log(Age)	-0.02	0.5153	-0.03	0.3257	-0.02	0.5918	-0.04	0.2496
VC	0.04	0.4165	-0.06	0.3165	0.03	0.5226	-0.07	0.2435
Debt/Assets	0.05	0.0502	0.03	0.1448	0.05	0.0276	0.04	0.105
Delaware Corp	0.02	0.6952	0.001	0.9811	-0.01	0.8987	0.001	0.9859
Internet IPO	0.02	0.8177	-0.18	0.15	-0.09	0.4736	-0.26	0.1027
Dual Share Class	0.17	0.1789	-0.05	0.7545	0.19	0.138	-0.01	0.9642
Lockup length	-0.0002	0.3268	-0.0002	0.2163	-0.0003	0.1981	-0.0003	0.1037
Book/Market	0.25	0.1087	0.70	0.0135	0.27	0.0848	0.63	0.0286
Intercept	-0.23	0.1317	-0.29	0.0647	-0.36	0.0446	-0.27	0.1027
Years	Yes		Yes		Yes		Yes	
Industry	Yes		Yes		Yes		Yes	
Adj R^2	5.5%	<.0001	7.9%	<.0001	5.1%	<.0001	7.5%	<.0001

Table VII. Frequency Reason for Delisting

Panel A. SB-2 IPOs

Status	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Active	259	48.9	259	48.9
Merge	77	14.5	336	63.4
Liquidate	0	0.0	336	63.4
Delist	194	36.6	530	100

Panel B. S-1 IPOs (Pooled)

Status	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Active	663	52.6	663	52.6
Merge	388	30.8	1051	83.4
Liquidate	4	0.3	1055	83.7
Delist	205	16.3	1260	100

Panel C. S-1 IPOs (Pair-Matched)

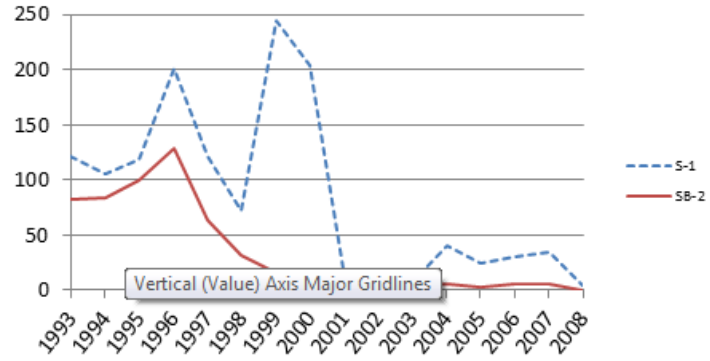
Status	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Active	286	55.2	286	55.2
Merge	141	27.2	427	82.4
Liquidate	0	0.0	427	82.4
Delist	91	17.6	518	100

determine outcome. Panel A shows 259 (48.9%) of the SB-2 firms still actively trading (CRSP delist code 100) after five years, compared to 663 (52.6%) of the pooled S-1 firms (Panel B), and 286 (55.2%) for the pair-matched sample (Panel C). Nearly one-third, 30.8% (27.2% using pair-matched), of the S-1 firms merged with other companies (delist codes 200–261), compared to only 14.5% of the SB-2 firms. In contrast, only 16.3% (17.6% pair-matched) of the S-1 companies were delisted by the current exchange because of unmet standards (delist codes 550–587), compared to 36.6% of the SB-2 companies. Examples of unmet standards include the security's price falling below an acceptable level, insufficient assets, and not meeting the exchange's financial guidelines.

If we consider the top two rows in each panel of Table VII to indicate success (active or merge) and the bottom two rows to indicate failure (liquidate or delist), then SB-2 IPOs have a 63.4% success rate whereas S-1 IPOs have 83.4% pooled and 82.4% pair-matched success rates. The chi-square *z*-statistic difference in frequencies is statistically significant at the 1% level.[6]

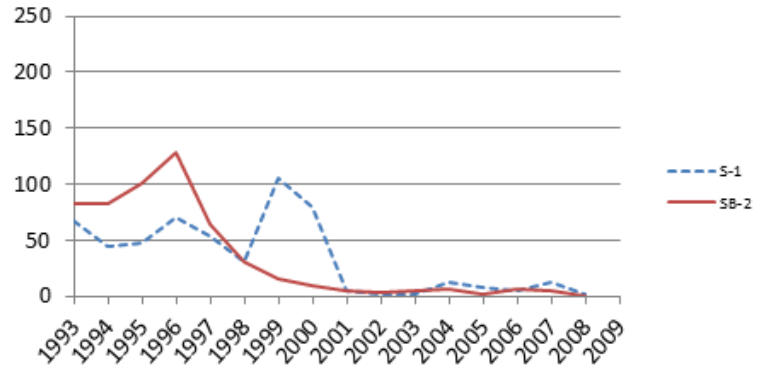
Our final hypothesis, H4, addresses IPO hot issues markets and states that SB-2 IPOs have significant market cycles which are more volatile than S-1 IPOs. "Hot IPO markets" are periods of either a) large numbers of IPOs or b) high underpricing. We begin our hot market analysis by charting the annual frequencies of IPOs (Figures I and II). In Figure I, we compare the SB-2 sample to the S-1 pooled sample to capture the volume of small S-1 IPOs in general. The figure reveals two main spikes (1996 and 1999) for S-1 IPOs, along with smaller spikes in 2004 and 2007. The lower line on the figure, depicting SB-2, shows one spike in 1996, but none thereafter. Casual inspection thus suggests that S-1 IPOs experience a stronger IPO market cycle effect. In fact, the graph for the volume of SB-2 IPOs seems to suggest the legislature was a fad that was most popular in 1996, as opposed to displaying true hot markets cycling.

Figure I. Number of IPOs by Year (Pooled S-1 Sample)



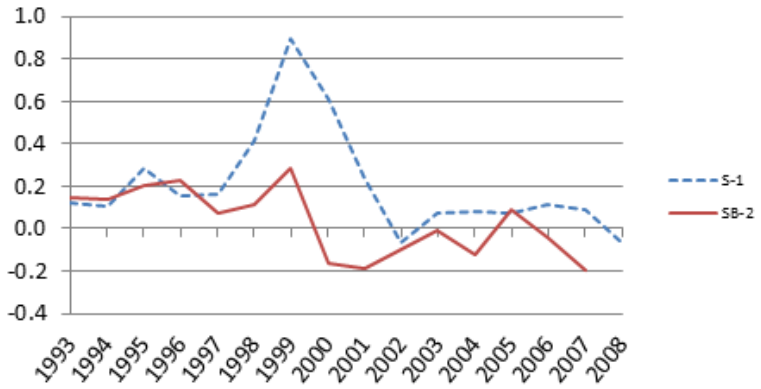
[6] We also compute parametric *t*-statistic difference in means and nonparametric Wilcoxon rank tests. The *p*-value for every test is less than 0.0001.

Figure II. Number of IPOs by Year (Pair-Matched S-1 Sample)



The hot markets literature uses not only the number of IPOs, but also the degree of underpricing to measure hot markets (Lowry and Schwert (2002)). Figure III charts the underpricing of the SB-2 sample compared to the pooled S-1 sample, and Figure IV charts the pair-matched S-1s. Note in both figures that both SB-2 and S-1 IPOs demonstrate cycles. The cycles are slightly more pronounced in Figure IV, with each type of IPO experiencing four peaks. Interestingly, only the 1999 peak coincides for both issue types. The underpricing hot issue market seems to be issue-type dependent and not an artifact of general market conditions.

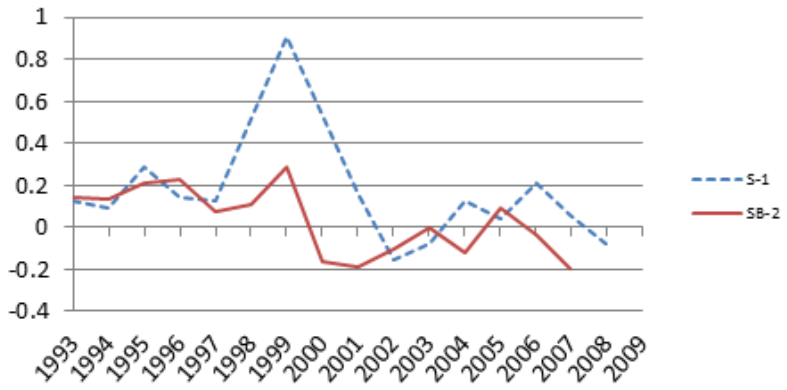
Figure III. Underpricing of IPOs by Year (Pooled S-1 Sample)



Next, we estimate the volatility of the number of IPOs by year to test the volatility of the two samples. The S-1 pooled sample has a standard deviation of 78.8 compared to an SB-2 standard deviation of 42.5. The difference between the two is

significant beyond the 1% level. The number of S-1 IPOs is more volatile than the number of SB-2 IPOs.

Figure IV. Underpricing of IPOs by Year (Pair-Matched S-1 Sample)



Examining the standard deviations of annual underpricing, the SB-2 sample experiences a standard deviation of 15.8% compared to 24.7% (pooled) and 26.8% (pair-matched). These differences are statistically different beyond the one percent level. The underpricing of S-1 IPOs is more volatile than the underpricing of SB-2 IPOs.

As a final examination, we compute a chi-square test comparing the frequency distribution in the number of IPOs for the SB-2 sample versus both S-1 IPO samples. Both chi-square tests indicate a statistically significant difference in frequencies beyond the one percent level. In sum, we confirm our initial hypothesis that SB-2 and S-1 IPOs experience hot markets; however, SB-1 IPOs are more volatile in terms of number of IPOs and underpricing than SB-2 IPOs.

IV. CONCLUSION

Our paper examines the three IPO phenomena of initial returns, long-run returns, and hot issue markets. We find that SB-2 IPOs have less underpricing than S-1 IPOs. This result is surprising, as many of the measures of uncertainty indicated that SB-2 IPOs may be more risky than S-1 IPOs. Abnormal one-year returns indicate that SB-2 IPOs do not underperform S-1 IPOs, and in some specifications even significantly outperform S-1 IPOs. Again, these returns results are surprising

considering the earlier tests which indicated SB-2 IPOs may be of lower quality vis-à-vis S-1 IPOs.

We also document that SB-2 IPOs experience hot markets, especially when measured by underpricing. Surprisingly, SB-2 IPOs are less volatile than S-1 IPOs in terms of both numbers of IPOs issued per year and underpricing per year.

Finally, we document additional support for the small-firm uniqueness hypothesis, namely that small firms are different from large firms along many dimensions. Our use of the SB-2 program adds another unique methodology to the extant literature, allowing us to statistically test if small firms differ from larger firms.

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APPENDIX A: Variable Definitions

Big Six	Dummy variable that indicates a company used one of the big six auditors at the time of the IPO (Arther Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG, or PricewaterhouseCoopers. If a "big 6" auditor was used, this variable is assigned a '1' value, if not, it is assigned a '0'. This variable is derived from the "*auditor1*" variable in the SDC data.
Book/Market	Book to market ratio taken from Compustat's common equity and CRSP's outstanding shares and price to calculate the market value.
Cash Flow	Inflation adjusted Compustat "*OANCF – Operating Activities Net Cash Flow*" data item.
Debt/Assets	Calculated from Compustat "*DLTT – Long-Term Debt Total*" divided by Compustat "*AT – Assets Total*".
Delaware Corp	Dummy variable that indicates a company filed its IPO in the state of Delaware. Assigned the value of "1" if the IPO was filed in Delaware, "0" if not.
Dual Share Class	Dummy indicating if the firm had dual-class shares. Derived from Jay Ritter's list of 591 IPOs with multiple share classes outstanding (http://bear.warrington.ufl.edu/ritter/dual-class-ipo.htm). This variable is assigned a value of "1" if the IPO involved dual-class shares, "0" if not.
Exchange	The exchange where the IPO is listed. Taken from the SDC variable name "*exchlisted*".
Internet IPO	Dummy variable that indicates if the firm filing an IPO is an internet company. Taken from Jay Ritter's list of internet IPOs (http://bear.warrington.ufl.edu/ritter/ipodata.htm). Loughran and Ritter (2004) shows that the internet bubble during 1999-2000 had a dramatic effect on IPO underpricing. This variable is assigned a value of "1" if the company is an internet IPO, "0" if it is not.
Lockup Length	Period of time following the IPO which insiders cannot sell company shares. This variable comes from the "*lockupdays*" variable in the

	SDC data.
Log(Age)	The "*age*" variable is the number of years from the founding of the company to the time of the IPO. Taken from Jay Ritter's data set that includes founding dates for over 9,000 firms going public in the U.S. during 1975 to 2009 (http://bear.warrington.ufl.edu/ritter/FoundingDates.htm). We use the log of "*age*" in our models.
Log(Sales)	This variable is taken from Compustat's "*REVT – Revenue Total*" data item. We use the log of inflation adjusted sales in our models.
Overhang	Shares retained divided by primary shares sold.
SB	Dummy variable that indicates whether or not a firm filed the IPO using the SB-2 form. If the firm used the SB-2 form this variable is assigned a "1" value and "0" if not. Derived from the "*secform*" variable in the SDC data.
Underprice	This variable is the calculated ratio of the first day's price (from CRSP daily data field "*prc*") divided by the offer price (take from SDC "*offerprice*") minus 1.
UW Rank	This variable represents the percentage share that an underwriter has of all IPO proceeds in the year of the IPO. This variable is derived from the two SDC variables "*bookrun1*" which is the name of the underwriter for the IPO and "*proceeds*" which is the amount of the proceeds from the IPO.
VC	Dummy variable that indicates whether the company has venture capital backing. This variable is taken from the SDC "*vcbacked*" variable. A "1" is assigned if the company has backing from venture capital, "0" if not.