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ABSTRACT

Prior studies have shown that newly public firms exhibit a high degree of uncertainty and asymmetric information, with few reliable sources of information. These findings suggest that investors could benefit if some independent party is able to assess the quality of a newly public firm. Since other studies have found that banks can reduce information asymmetry about firms that borrow, we examine whether banks provide information about the quality of newly public firms. We find that bank lending is consistently associated with positive long-term outcomes—newly public firms that borrow experience significantly smaller decreases in operating performance and better long-term stock performance than non-borrowers.

JEL Classification: G14, G21
Keywords: Newly public firms, Bank lending, IPO

I. Introduction

DESPITE THE FACT THAT THE INITIAL PUBLIC OFFERING (IPO) is a significant information-releasing event in the life of a firm, newly public firms experience a high degree of uncertainty and asymmetric information between the firm and investors, with few reliable sources of information (Teoh, Wong, and Rao, 1998). Several studies have documented that IPO firms, on average, generate positive abnormal stock returns in

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the short run but declining stock and operating performance in the long run (e.g., Loughran and Ritter, 1995). Furthermore, owners of a pre-IPO firm possess private information about the quality of the firm and may not truthfully disclose this information. Consistent with this notion, Ang and Brau (2002) show that IPO prospectuses are contaminated by optimistic bias, window dressing, and earnings manipulation. Teoh et al. (1998) report that newly public firms are more likely to engage in earnings management than are seasoned publicly traded firms. Moreover, analysts are overoptimistic about newly public firms and systematically overestimate their earnings (e.g., Dechow et al. 2000; Lin and McNichols, 1998; Michaely and Womack, 1999; Rajan and Servaes, 1997; Teoh and Wong, 2002).

The evidence in the studies highlighted above suggests that investors could benefit if some independent party were available to help assess the quality of a newly public firm. Theories of financial intermediation postulate that banks, through screening and monitoring associated with their lending activity, play a special role in reducing information asymmetry about firms that borrow (see Diamond 1984, 1991; Fama 1985; and Ramakrishan and Thakor1984). This study examines whether banks provide valuable information about the quality of newly public firms. Specifically, we examine whether bank lending to newly public firms is associated with better long-run performance in operating returns and stock returns.

We document a positive relation between bank lending and long-term performance of newly public firms. Generally, operating performance declines several years after an IPO.1 However, post-IPO borrowers experience significantly smaller declines in operating performance than do non-borrowers. Furthermore, post-IPO borrowers have better stock performance up to three years following the IPO. These findings suggest that banks perform an important role in certifying firm quality (identifying firms with better future prospects) and/or contributing to borrowers' subsequent performance through mechanisms identified in previous studies, such as monitoring or loan covenants (Diamond, 1984).

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[1] Field and Karpoff (2002), Friedlan (1994), Jain and Kini (1994), and Mikkelson et al. (1997) also document post-IPO performance decline.

This study contributes to the existing literature in several ways. First, we document that bank loans serve as a significant source of funds for newly public firms. Second, we show that bank lending helps to reduce information asymmetry and uncertainty about newly public firms. Third, we extend studies on bank lending to private and pre-IPO firms and show that the positive effect of bank lending continues in the post-IPO stage.

The remainder of the paper is organized as follows. The next section reviews related literature. Section III describes the data and examines differences in characteristics between post-IPO borrowers and non-borrowers. Section IV compares post-IPO operating and stock performance of borrowing and non-borrowing firms. Section V concludes the paper.

II. Literature Review

Accepted theories of financial intermediation postulate that banks acquire private information during the lending process (e.g., Berlin and Loeys, 1988; Bernanke, 1983; Diamond 1984, 1991; Fama, 1985). Leland and Pyle (1977) argue that the main reason for the existence of intermediaries is information asymmetry. Campbell and Kracaw (1980) argue that financial intermediaries produce information because the production of information and various intermediary services are naturally complimentary activities.[2]Overall, prior studies have concluded that banks use information-gathering and screening technology to produce information about a borrowing firm by thoroughly scrutinizing the borrower (e.g., Lummer and McConnell, 1989; Hauswald and Marquez, 2006). When a lending decision becomes publicly available, it therefore provides a favorable signal to the market about the future prospects of the borrowing firm.

In addition, banks undertake ongoing monitoring of borrowing firms while a loan is outstanding (Diamond, 1984; Fama, 1985). Such monitoring, combined with loan covenants and collateral requirements, helps to mitigate moral hazards and reduces the borrower's likelihood of default (Rajan and Winton, 1995). Monitoring by the lending bank is another reason why we might expect bank lending to be associated with improved subsequent operating performance of the borrower.

[2]See also theoretical works by Black (1975), Kane and Malkiel (1965), Ramakrishan and Thakor (1984), and Boyd and Prescott (1986).

Theory thus indicates at least two mechanisms by which a bank loan can enhance a borrowing firm's value: screening, in which banks attempt to identify successful firms ex ante and monitoring, in which banks attempt to induce borrowing firms to achieve positive financial outcomes after the loan has been originated. Several empirical studies provide evidence that bank loans are "special" or "unique" by documenting positive abnormal returns to the announcements of bank loan agreements (e.g., James, 1987; Lummer and McConnell, 1989; Mikkelson and Partch, 1986).

The unique feature of our study is that we examine bank lending to newly public firms. In the empirical sections below, we test the hypothesis that bank loans are associated with improved subsequent operating performance. More recent studies have found positive effects of bank lending among private and pre-IPO firms (Schenone, 2004; Gonzalez and James, 2007; Benzoni and Schenone, 2010), whereas studies of seasoned public firms have found no such positive effects of bank lending (Billett et al. 2006; Fields et al. 2006). Reconciling these contrasting results is possible if the informational benefit of bank lending dissipates soon after a firm goes public. Such a pattern seems plausible because the IPO process generates and discloses new financial information about the firm. Therefore, by using data for newly public firms, we also shed new light on whether the pre-IPO benefits of bank lending identified in the prior literature vanish immediately upon going public or instead persist into the first years after the IPO. The next section describes our data and sample in more detail.

III. Sample Description

A. Data Sources and Sample Selection

We combine data from the following four sources: the Securities Data Corporation (SDC) New Issues database, the Dealscan database, the Center for Research and Security Prices (CRSP), and COMPUSTAT. The SDC New Issues database is utilized to identify U.S. common stock offerings during the period January 1, 1990 – December 31, 2000.[3] We eliminate closed-end funds, depositary shares, real

[3] Our sample starts in 1990 because Dealscan has limited coverage of bank loans prior to the 1990s. Previous studies that document benefits of pre-IPO bank lending also end their samples in 2000(see, for example, Schenone, 2004; Gonzalez and James, 2007; Benzoni and Schenone, 2010).Thus, this time

estate investment trusts (REITs), spinoffs, unit issues, reverse leveraged buyouts, financial institutions (SIC codes 6000-6999), and utilities (SIC codes 4900-4999). We also eliminate IPOs with offer prices below five dollars, and we check for the availability of post-IPO stock and accounting data on CRSP and COMPUSTAT, respectively. Previous IPO studies have used similar sample exclusion criteria (for example, Jain and Kini, 1994; Field and Karpoff, 2002; Gonzalez and James, 2007; Field and Lowry, 2009). Our final IPO sample contains 3,218 firms.

Data on the offer date, offer price, initial filing range, net IPO proceeds, and on whether the firm was backed by a venture capitalist are collected from SDC. For each firm, we also calculate the price run-up as the percentage difference between the offer price and the midpoint of the initial filing range. In addition, we compute the initial return as the percentage difference between the first after-market closing price and the offer price. We also record firm age, measured as the number of years since the company was founded.[4]

To determine which IPO firms receive bank loans soon after the initial public offering, we collect information on bank loans from the Dealscan database supplied by the Loan Pricing Corporation. Dealscan provides information on the characteristics and terms of bank loans, including the identity of the borrower and the lender and the date, type, amount, rate, and collateral of the loan. We restrict our sample to U.S. firms that borrowed from banks during the period January 1, 1990 – December 31, 2001, and we have loan year stock returns and accounting data on CRSP and COMPUSTAT, respectively. The sample period for loan deals is set at one year longer than the sample period for IPO firms to include information on loan deals for at least one year after the initial public offering in our analysis. To ensure that the abnormal "tech bubble" years do not influence our results, we check the robustness of our main findings by excluding firms that went public during 1998 – 2000; the results do not change qualitatively and are not reported for brevity.

Using Dealscan data, we collect information on the first bank loan to a newly public firm with the loan active date within one year from the IPO offer date. Out of

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period allows us to draw comparisons and make connections with the existing literature on the positive effects of bank lending for young public firms.

[4] We thank Laura Field for providing firm age data. These data come from various sources and are described in Field and Lowry (2009, footnote 2).

3,218 IPO firms, 765 had a loan agreement within one year from the initial public offering. One-third of these loan deals occurred during the first quarter after the IPO date. Hereinafter, firms that borrow from banks within one year after the IPO date are called "post-IPO borrowers." Firms that do not borrow within one year after the IPO are labeled "non-borrowers." Table I presents a summary of the variable definitions and sources of data.

B. Summary Statistics

Table II reports sample descriptive statistics on the number of IPOs, the IPO offer characteristics, the number of post-IPO borrowers, and on bank loan characteristics, aggregated across the total sample and by IPO year. The average firm in the sample raised about US$50 million in net IPO proceeds and experienced a first-day return of about 26 percent. The median firm raised more than US$26 million, with a median initial return of 10 percent. The time trends in the number of IPOs, IPO proceeds, and initial IPO returns are consistent with those of previous studies and show a well-documented pattern that IPOs in the period from the late 1990s to the early 2000s were large IPOs with high first-day returns (see Loughran and Ritter, 2004; Ritter and Welch, 2002).

It is striking that, despite the funds raised in an IPO, many newly public firms draw on bank financing. In the sample of 3,218 U.S. firms that went public during 1990 – 2000, almost one-quarter (764, or 24 percent) borrowed from banks at least once during their first year of public trading. The average loan amount was $84 million, which is 1.7 times the average amount raised through the initial public offering. The median loan amount was more than $30 million, which is also larger than the median $26 million raised by a firm through an IPO. Overall, banks contributed a significant portion to the financing mix of newly public firms, with the loan amount exceeding the net IPO proceeds by 44 percent. These statistics suggest that a significant portion of newly public firms rely heavily on bank loans soon after the initial public offering.

Table I
Variable Definitions and Data Sources

Firm Characteristics	*Source: All variables, unless stated otherwise, are from COMPUSTAT Industrial Annual*
Total Assets	data6
Sales	data12
Tot Debt /Tot Assets	leverage ratio = (data9+data5)/data6
PPE /Total Assets	tangible assets =ratio of property, plan equipment to total assets = data7/data6
ROA	return on assets = ratio of net income to total assets = data13/data6
Inv. / Total Assets	data3/data6
Tobin's Q	market value of equity plus total debt, divided by total assets =(data24*data25+data9+data5)/data6
Age	firm age (in years) from the date of incorporation to the IPO date; see Field and Lowry (2009) for explanation of data sources.
Tech Industry	an indicator variable that equals 1 for firms in the technology industry (based on four digit SIC codes listed in Loughran and Ritter, 2004) and equals 0 otherwise
Offer Characteristics	*Source: SDC New Issues database*
Net IPO Proceeds	the amount raised by a firm through the initial public offering, minus the total fees paid, adjusted for inflation and reported in millions of real 1990 dollars
VC-backed	an indicator variable that equals 1 if an IPO firm was backed by a venture capitalist at the time of IPO and equals 0 otherwise
Price Run-up	the percentage difference between the offer price and the midpoint of the initial filing range
Initial Return	the percentage difference between the first after-market closing price (from CRSP) and the offer price
Loan Characteristics	*Source: Dealscan*
Loan Amount	the amount borrowed from a bank, adjusted for inflation and reported in millions of real 1990 dollars
All-In Spread Drawn	measures the amount the borrower pays in basis points over LIBOR for each dollar drawn down and includes the spread of the loan and any annual or facility fee paid to the bank
Syndicate	an indicator variable that equals 1 if more than one bank was involved in loan agreement and equals 0 otherwise

Table II
Sample Descriptive Statistics

The sample includes 3,218 U.S. firms that went public during 1990-2000. *Post-IPO Borrowers* are 765 firms that borrow from banks within one year from the firm's IPO. IPO data are from SDC, bank loan data are from Dealscan, and stock performance data are from CRSP. *Net IPO Proceeds* and *Loan Amount* are adjusted for inflation and are reported in millions of real 1990 dollars. Variable definitions are provided in Table I.

		IPO Offer Characteristics			Bank Loan Characteristics		
IPO Year	Numb of IPOs	Net IPO Proceeds Mean [Median]	Initial Return Mean [Median]	Number of post-IPO Borrowers	Loan Amount Mean [Median]	Loan Amount/ Net IPO Proceeds Mean [Median]	All-In Spread Drawn Mean [Median]
1990	68	37.33	8.08	19	85.59	1.59	201.25
		[23.43]	[5.72]		[20.00]	[0.88]	[255.00]
1991	175	42.20	12.13	41	91.19	1.20	234.71
		[24.94]	[7.50]		[15.33]	[0.62]	[255.00]
1992	270	38.98	10.76	70	46.78	1.10	241.21
		[22.40]	[4.36]		[23.16]	[0.85]	[250.00]
1993	350	33.74	12.07	101	63.61	1.32	209.46
		[22.46]	[6.13]		[35.78]	[0.94]	[200.00]
1994	291	29.38	9.84	72	67.23	1.36	187.78
		[19.33]	[4.81]		[32.13]	[1.23]	[175.00]
1995	322	40.65	21.00	67	110.47	1.48	199.67
		[24.70]	[12.54]		[23.35]	[0.67]	[200.00]
1996	476	41.22	16.83	127	100.78	1.93	209.68
		[25.97]	[10.00]		[30.38]	[0.98]	[200.00]
1997	355	39.34	13.67	113	68.08	1.38	186.44
		[23.69]	[8.90]		[23.16]	[1.00]	[175.00]
1998	214	77.02	23.16	61	139.00	2.02	192.26
		[26.78]	[9.47]		[56.47]	[1.33]	[175.00]
1999	383	77.25	72.98	54	156.73	0.95	212.08
		[37.34]	[38.75]		[39.89]	[0.50]	[212.50]
2000	314	84.76	58.09	40	181.36	0.95	256.69
		[43.31]	[28.14]		[33.78]	[0.52]	[255.00]
10-Year Averages		49.59	25.93		84.05	1.44	208.00
		[26.47]	[10.00]		[30.31]	[0.91]	[200.00]
Totals	3,218			765			

The time trends in loan frequency and loan characteristics are also noteworthy. By the end of the sample period, which was characterized by large IPO proceeds and high initial returns, the proportion of IPO firms receiving bank loans dropped to less than 13 percent. Firms borrowed large amounts during those years, with the mean loan

Table III
Differences in Firm and Offer Characteristics between Post-IPO Borrowers and Non-Borrowers

The sample includes 3,218 U.S. firms that went public during 1990-2000. *Post-IPO Borrowers* are the 765 firms that borrowed from banks within one year of the firm's IPO. IPO data are from SDC, bank loan data are from Dealscan, accounting data are from COMPUSTAT, and stock performance data are from CRSP. All accounting variables are measured at the fiscal year-end immediately prior to the IPO year. Variable definitions are provided in Table I. *** and **indicate significance at the 1% and 5% levels, respectively.

Characteristics	Overall Sample Mean [Median]	Post-IPO Mean [Median]	Non-Borrowers Mean [Median]	*t*-statistic for the in Means [Medians]
Total Assets (1990 real $, mln)	169.27 [18.08]	447.44 [47.28]	82.51 [14.52]	364.93*** [32.76]***
Sales (1990 real $, mln)	155.52 [20.71]	378.87 [52.70]	85.86 [15.33]	293.01*** [37.37]***
Total Debt / Total Assets	0.60 [0.56]	0.67 [0.65]	0.58 [0.52]	0.09*** [0.14] ***
PPE / Total Assets	0.36 [0.26]	0.44 [0.35]	0.33 [0.24]	0.11*** [0.11] ***
ROA	-0.05 [0.11]	0.11 [0.15]	-0.10 [0.09]	0.21*** [0.05] ***
Inventory / Total Assets	0.12 [0.04]	0.16 [0.07]	0.11 [0.03]	0.05*** [0.04]***

Table III (continued)

Characteristics	Overall Sample Mean [Median]	Post-IPO Mean [Median]	Non-Borrowers Mean [Median]	*t*-statistic for the in Means [Medians]
Age	13.55	18.08	12.10	5.98***
	[7.00]	[9.00]	[7.00]	[2.00]***
VC-backed	0.42	0.31	0.46	0.14***
	[0.00]	[0.00]	[0.00]	
	0.21	0.10	0.25	-0.15***
	[0.00]	[0.00]	[0.00]	
	25.93	16.41	28.90	-12.48***
	[10.00]	[7.50]	[10.71]	[-3.21]***
Price Run-Up (%)	-1.48	-4.22	-0.63	-3.59***
	[0.00]	[0.00]	[0.00]	[0.00]***

amount peaking at $181 million (median = $34 million) in 2000. However, the loan amounts were smaller relative to net IPO proceeds during those years than in any prior year. Furthermore, the loan cost was relatively high at the end of the sample period. The mean loan cost, measured by "all-in spread drawn," was 208 points (median = 200) for the overall sample and reached 257 basis points (median = 255) in 2000.[5]

These statistics show that fewer IPO firms borrowed from banks during the "tech bubble" years (1998 – 2000), but those firms that did borrow during those years paid higher interest rates. This pattern could indicate that many firms did not need bank loans during those years since they were able to raise large amounts through an IPO. An alternative explanation is that banks were more selective during "hot IPO" years. They loaned to fewer IPO firms, offered smaller amounts relative to net IPO proceeds, and charged higher interest rates.

In non-tabulated analysis, we examine the distribution of loans by loan purpose, loan structure, and firms' credit rating and find the following patterns. The most frequently stated purpose of a loan is general corporate purpose (35 percent of loans), followed by debt repayment (25 percent) and working capital needs (16 percent). Sixty percent of post-IPO loans are secured. The Standard and Poor's credit rating at the close of the loan deal is A-AAA for 1.4 percent of the firms, B-BBB for 12.9 percent of the firms, and is not available for 85 percent of the sample firms.

C. Borrowers versus Non-Borrowers

Table III compares characteristics of post-IPO borrowers and non-borrowers. All accounting measures are from COMPUSTAT for the year immediately prior to the IPO year. Since about one third of post-IPO borrowers receive loans within three months of the initial public offering, the arbitrary choice of a pre-IPO year ensures that firms' characteristics are not affected by the bank loan examined in the following analysis. Data prior to their IPO year are not available on 178 firms.[6]

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[5] "All-in spread drawn," reported by Dealscan, measures the amount the borrower pays in basis points over the London InterBank Offered Rate (LIBOR) for each dollar drawn down, and includes the spread of the loan and any annual or facility fee paid to the bank group.

[6] Of these, 38 firms borrowed from the banks within one year of their IPO date. For these 178 firms, we collect accounting variables for the IPO year. The main results do not change if we omit these firms from the analysis.

Table III shows that post-IPO borrowers are quite different from non-borrowers. They are much larger (as measured by the firms' assets and sales), have higher leverage (measured by the ratio of debt to assets), and carry a higher level of inventory relative to total assets. Post-IPO borrowers are more profitable (measured by return on assets) and invest more in tangible assets (measured by the ratio of property, plant, and equipment to total assets).

Offer characteristics also differ between post-IPO borrowers and non-borrowers. Post-IPO borrowers have been in business longer at the time they go public, are less likely to be backed by venture capitalists, and are less likely to operate in the technology industry. Post-IPO borrowers also have lower initial returns.

In summary, this section documents that a significant portion of newly public firms borrow large amounts from banks soon after the initial public offering. The firm and IPO characteristics of post-IPO borrowers are quite different from those of non-borrowers. The next section examines whether bank lending is associated with better performance of newly public firms.

IV. Post-IPO Borrowers versus Non-Borrowers: Post-IPO Performance

Fama (1985) argues that banks may enhance a borrowing firm's value by reducing information asymmetry or by monitoring firm performance. We investigate whether bank lending within one year after the initial public offering is associated with better subsequent operating and long-term stock performance.[7] This setting allows us to examine whether banks enhance the performance of borrowing firms in an environment with high information production by public sources and also with a high degree of uncertainty about future firm performance.

Our model and data have several intrinsic limitations. Like other studies in the literature, we cannot establish causality between bank lending and firms' financial outcomes. Similarly, we cannot identify whether any observed differences in performance between borrowers and non-borrowers are attributed to banks' screening activities versus monitoring or loan covenants. Finally, we cannot observe the demand for bank loans, and thus cannot say whether non-borrowing firms were denied bank

[7] In unreported analysis, we find no differences in survival rates between post-IPO borrowers and non-borrowers. This suggests that we do not encounter a survivorship bias when comparing the long-term performance of borrowers and non-borrowers.

credit or did not need to borrow. Other studies of bank lending have all faced these or similar limitations (Lummer and McConnell, 1989; Billett et al. 2006; Gonzalez and James, 2007; Benzoni and Schenone, 2010).

A. Changes in Operating Performance after the IPO

We first investigate whether a firm's post-IPO operating performance is related to its borrowing soon after the initial public offering. Operating performance is measured as operating return on assets (ROA), which equals operating income divided by the book value of total assets. We examine both raw and industry-adjusted changes in ROA measured from the IPO year through each of the five years following the IPO. The raw change in ROA for IPO firm *i* from the year of the IPO (year 0) to year *t* is

$$\Delta ROA_{i,(0,t)} = ROA_{i,t} - ROA_{i,0} \quad (1)$$

The industry-adjusted change in ROA controls for the contemporaneous change in firm *i*'s industry ROA and is measured as firm *i*'s change in ROA minus the industry median change in ROA on the same date. The industries are based on the most disaggregated SIC category containing at least five non-IPO firms, up to four-digit SIC codes.[8] The industry-adjusted change in ROA for IPO firm *i* from the year of the IPO (year 0) to year *t* is:

$$\text{Adjusted } \Delta ROA_{i,(0,t)} = (ROA_{i,t} - ROA_{i,0}) - (\text{Industry Median } ROA_{i,t} - \text{Industry Median } ROA_{i,0}) \quad (2)$$

Data to compute changes in ROA through the first post-IPO year are available for 2,906 IPO firms, declining to 1,723 firms for a five-year change in ROA.

[8] That is, we use four-digit SIC codes for industries containing at least five non-IPO firms, or three-digit SIC codes if there are at least five non-IPO firms at the three-digit level but not at the four-digit level. We use two-digit SIC codes if the three-digit level contains fewer than five non-issuing firms.

Table IV reports mean values of raw and industry-adjusted changes in ROA measured through each of the five years following the IPO. Consistent with prior studies, operating performance declines over all time intervals examined (see Field and Karpoff, 2002; Friedlan, 1994; Jain and Kini, 1994; Mikkelson et al. 1997). As shown in Panel A, the mean change in the raw ROA from the IPO year to the following year is –0.051, with a *t*-statistic of –12.45. The mean change from the IPO year through the following two years is –0.069, with a *t*-statistic of –13.46. The average change in raw ROA remains around –0.06 through years 3, 4, and 5.

Panel B shows that industry-adjusted changes in ROA are also significantly negative for the first five years after the IPO. From the IPO year to the following year, the industry-adjusted change in ROA is –0.039 with a *t*-statistic of –9.20. From the IPO year to years 2 and 3, the industry-adjusted change in ROA is about –0.05, leveling off to about –0.040 for years 4 and 5 after the IPO.

Table IV further reports differences in raw and industry-adjusted changes in operating performance between post-IPO borrowers and non-borrowers. Within three years after the IPO, changes in operating performance tend to be less negative for firms that borrow from banks within one year after the IPO than for other firms. For example, from the IPO to the following year, the mean industry-adjusted change in ROA is –0.046 for non-borrowing firms, compared to –0.016 for borrowing firms. This difference is statistically significant at the 1 percent level, and decreases starting in year 3 after the IPO. By year 5, this difference disappears. This suggests that banks are "special" in the sense that they are able to identify firms with better future prospects and/or contribute to better operating performance of post-IPO borrowers through monitoring, loan covenants, or related mechanisms.

Table V provides additional support for this finding. It reports the results of ordinary least squares (OLS) regression of industry-adjusted changes in ROA on the presence of post-IPO loan and other firm characteristics, measured through two years after the initial public offering. *Post-IPO Loan* is an indicator variable that equals 1 if a firm borrows from a bank within one year after its IPO, and equals 0 otherwise. Other variables (*Tobin's Q*, *Ln (Net IPO Proceeds)*, *Ln (1+Age)*, *Initial Return*, *VC-backed*) are included to control for characteristics of firms and offers. IPO-year dummy variables are also included but are not reported in the table.

As shown in Table V, borrowing from a bank within one year after the initial public offering is associated with significantly positive changes in industry-adjusted operating performance. Taken together with the results from the univariate analysis, this evidence suggests that, controlling for various firm characteristics, post-IPO

borrowers experience smaller performance declines after the IPO compared to non-borrowers. This finding refines the conclusion of Billett et al. (2006) that, in general, borrowers experience significantly negative operating performance, by suggesting that despite this pattern, post-IPO borrowers perform better than non-borrowers. Therefore, some borrowers (including post-IPO borrowers) seem to benefit from bank lending.

B. Post-IPO Stock Performance

We next investigate another measure of firm performance: post-IPO long-run stock returns. Table VI reports monthly buy-and-hold (BH) returns for one, two, and three years after the initial public offering date for post-IPO borrowers and non-borrowers. Raw returns (*BH Raw*) and returns
adjusted for a value-weighted (*BHVW*) and an equally weighted (*BHEW*) CRSP index are presented for all three years. For firms that do not survive for a given year after a firm's IPO, we consider monthly returns up to the last available return.

Results presented in Table VI show that post-IPO borrowers perform better than non-borrowers in each time period considered. For example, firms that borrow from banks within one year after that firm's IPO outperform non-borrowing firms by 14 percent (using the CRSP value-weighted benchmark) during the first year after the initial public offering. The difference in buy-and-hold abnormal returns between post-IPO borrowers and non-borrowers is statistically significant over the one- and two-year post-IPO time periods. This pattern contrasts with the negative three-year abnormal stock returns found by Billett et al. (2006) for seasoned (i.e., non-IPO) firms, but is consistent with the idea presented in the introduction that banks may help alleviate the informational noise surrounding newly public firms.

Table VII provides additional support for this finding. It reports the results of an ordinary least squares regression of the two-year buy-and-hold abnormal return (adjusted for the value-weighted CRSP return) on the presence of a post-IPO loan and other firm characteristics. The coefficient on *Post-IPO Loan* is positive and significant at the 1 percent level. Consistent with the evidence presented in Table VI, this result indicates that borrowing from a bank soon after the IPO is associated with positive long-term stock performance. This long-term stock effect is consistent with the pattern of long-term operating performance reported in Table V.

Table IV
Changes in Post-IPO Operating Performance

Average changes in return on assets (ROA) are reported for each of five years after the IPO. The sample includes U.S. firms that went public during 1990-2000. *Post-IPO Borrowers* are firms that borrow from banks within one year of the firm's IPO. *Non-Borrowers* are firms that do not borrow from banks within one year of the firm's IPO. Panel A reports the mean raw change in ROA, measured as operating income divided by the book value of total assets from the year of the IPO through each of five years post-IPO. Panel B reports the mean industry-adjusted change in ROA, measured as the raw change minus the contemporaneous change in industry median ROA for the same time period. The industries are based on 4-digit SIC codes if there is a minimum of at least 5 non-issuing firms, else 3-digits SIC codes, or 2-digit SIC codes. IPO data are from SDC, bank loan data are from Dealscan, accounting data are from COMPUSTAT. *t*-statistics are in parentheses. *** and * indicate significance at the 1% and 10% levels, respectively.

	Change in ROA Measured through				
	Year 1	Year 2	Year 3	Year 4	Year 5
Panel A: Raw Change in ROA					
All Firms	-0.051	-0.069	-0.066	-0.054	-0.055
	(-12.45)***	(-13.46)***	(-11.02)***	(-8.30)***	(-7.35)***
Non-Borrowers	-0.060	-0.078	-0.073	-0.058	-0.058
	(-11.53)***	(-12.08)***	(-9.55)***	(-6.88)***	(-5.99)***
Post-IPO Borrowers	-0.024	-0.040	-0.045	-0.044	-0.047
	(-4.99)***	(-6.76)***	(-7.09)***	(-6.74)***	(-6.68)***
Difference in Means	-0.035	-0.038	-0.028	-0.014	-0.011
	(-5.01)***	(-4.33)***	(-2.83)***	(-1.29)	(-0.91)
Panel B: Industry-Adjusted Change in ROA					
All Firms	-0.039	-0.052	-0.050	-0.039	-0.035
	(-9.20)***	(-10.17)***	(-8.37)***	(-6.01)***	(-4.64)***
Non-Borrowers	-0.046	-0.059	-0.055	-0.041	-0.035
	(-8.66)***	(-9.25)***	(-7.20)***	(-4.88)***	(-3.63)***
Post-IPO Borrowers	-0.016	-0.029	-0.036	-0.036	-0.036
	(-3.19)***	(-4.52)***	(-5.48)***	(-4.77)***	(-4.12)***
Difference in Means	-0.030	-0.031	-0.019	-0.005	0.001
	(-4.04)***	(-3.39)***	(-1.91)*	(-0.41)	(0.10)
Number of Firms	2,906	2,570	2,251	1,976	1,723

Table V
OLS Regression of Post-IPO Changes in Operating Performance

The sample includes 2,228 U.S. firms that went public during 1990-2000. The dependent variable is *Change in Industry-Adjusted ROA*, measured from the IPO year through 2 years post-IPO. *Industry-Adjusted ROA* is defined as net income divided by total assets for the IPO firm minus the industry median net income divided by total assets on the same date, where the industries are based on 4-digit SIC codes if there is a minimum of at least 5 non-issuing firms, else 3-digit SIC codes, or 2-digit SIC codes. *Post-IPO Loan* equals 1 if an IPO firm borrows from a bank within the first year after going public, and it equals 0 otherwise. IPO year dummy variables are included in the regression but not reported. IPO data are from SDC, bank loan data are from Dealscan, accounting data are from COMPUSTAT, and stock performance data are from CRSP. *t*-statistics are provided in parentheses. *** and ** indicate significance at the 1% and 5%levels, respectively.

Variable	Coefficient Estimate
Intercept	-0.219 (-5.52)***
Post-IPO Loan	0.030 (2.41)**
Tobin's Q	0.010 (5.02)***
Ln (Net IPO Proceeds)	0.015 (2.58)**
Ln (1+Age)	0.005 (0.94)
Initial Return	0.000 (0.87)
VC-backed	0.008 (0.73)
Adjusted R^2 (%)	2.34

Table VI
Buy-and-Hold Returns One, Two and Three Years after the IPO

The sample includes 3,218 U.S. firms that went public during 1990-2000. *Post-IPO Borrowers* are firms that borrow from banks within one year of the firm's IPO. *Non-Borrowers* are firms that do not borrow from banks within one year of the firm's IPO. *BH Raw Returns* are buy-and-hold firm returns, in percent. *BHVW* are buy-and-hold firm returns, in percentages, adjusted for contemporaneous CRSP value-weighted returns. *BHEW* are buy-and-hold firm returns, in percentages, adjusted for contemporaneous CRSP equally weighted returns. All returns are measured through 1, 2, and 3 years after a firm's IPO. IPO data are from SDC, bank loan data are from Dealscan, accounting data are from COMPUSTAT, and stock performance data are from CRSP. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Performance Measure	Post-IPO Borrowers	Non-Borrowers	Difference
1-year post-IPO			
BH Raw Returns	117.96	103.82	-14.14***
BHVW	2.29	-9.18	-11.47***
BHEW	5.35	-9.17	-14.52***
2-years post-IPO			
BH Raw Returns	133.40	112.39	-21.00***
BHVW	-0.16	-14.34	-14.18*
BHEW	5.71	-13.87	-19.58**
3-years post-IPO			
BH Raw Returns	134.49	119.61	-14.88*
BHVW	-14.93	-20.17	-5.23
BHEW	-6.50	-18.11	-11.61

Table VII
OLS Regression of Abnormal Returns Two Years after the IPO

The sample includes 3,218 U.S. firms that went public during 1990-2000. The dependent variable is a firm's buy-and-hold abnormal return, adjusted for contemporaneous CRSP value-weighted return, measured through two years following the initial public offering. *Post-IPO Loan* equals 1 if a firm borrows from a bank within the first year after going public, and it equals 0 otherwise. IPO year dummy variables are included in the regression but not reported. IPO data are from SDC, bank loan data are from Dealscan, accounting data are from COMPUSTAT, and stock performance data are from CRSP. Definitions of other variables are provided in Table I. *t*-statistics are provided in parentheses. *** and ** indicate significance at the 1% and 5%levels, respectively.

Variable	Coefficient Estimate
Intercept	-0.925
	(-2.86)***
Post-IPO Loan	0.343
	(3.37)***
Tobin's Q	0.313
	(18.31)***
Ln (Net IPO Proceeds)	0.014
	(0.30)
Ln (1+Age)	-0.010
	(-0.25)
Initial Return	-0.001
	(-1.42)
VC-backed	0.220
	(2.47)**
Adjusted R^2 (%)	15.91

V. Conclusion

Motivated by prior findings that newly public firms are characterized by a high degree of uncertainty, high information asymmetry between the firm and investors, and the few reliable sources of information, we examine whether banks provide valuable information about the quality of newly public firms. The main findings can be summarized as follows. Bank lending is consistently associated with positive long-term outcomes. Post-IPO borrowers, on average, experience significantly smaller decreases in operating performance than non-borrowers up to three years after the IPO. Likewise, firms that borrow from banks within one year after an IPO experience better long-term stock performance, on average up to three years after the IPO.[9] This pattern is consistent with the ability of banks to reduce the degree of asymmetric information by some combination of screening applicants and/or monitoring borrowers' actions, although our data cannot evaluate the relative contribution of these two mechanisms. In either case, bank loans appear to be special for newly public firms, consistent with recent findings for pre-IPO firms and in contrast to recent findings for seasoned firms.

REFERENCES

Ang, James S. and James C. Brau, 2002, "Firm Transparency and the Costs of Going Public", Journal of Financial Research 1, 1-17.

Benzoni, Luca and Carola Schenone, 2010, "Conflict of Interest and Certification: Long-Term Performance and Valuation of U.S. IPOs Underwritten by Relationship Banks", Journal of Financial Intermediation 19, 235-254.

Berlin, Mitchell and Jan Loeys, 1988, "Bond Covenants and Delegated Monitoring", Journal of Finance 43, 397-412.

[9] Of course, this does not mean that *every* post-IPO borrower experiences outcomes superior to every non-borrower, nor does it imply that banks can perfectly identify superior performers ex ante.

Bernanke, Ben S., 1983, "Nonmonetary Effects of the Financial Crisis in Propagation of the Great Depression", American Economic Review 73, 257-276.

Billett, Matthew T., Mark J. Flannery, and Jon A. Garfinkel, 2006, "Are Bank Loans Special? Evidence on the Post Announcement Performance of Bank Borrowers", Journal of Financial and Quantitative Analysis 41, 733-751.

Black, Fischer, 1975, "Banks Funds Management in an Efficient Market", Journal of Financial Economics 2, 323-340.

Boyd, John H. and Edward C. Prescott, 1986, "Financial Intermediary-coalitions", Journal of Economic Theory 38, 211-232.

Campbell, Tim S. and William A. Kracaw, 1980, "Information Production, Market Signaling, and the Theory of Financial Intermediation", Journal of Finance 35, 863-882.

Dechow, Patricia M., Amy P. Hutton, and Richard G. Sloan, 2000, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings", Contemporary Accounting Research 17, 1-32.

Diamond, Douglas W., 1984, "Financial Intermediation and Delegated Monitoring", Review of Economic Studies 51, 393-414.

Diamond, Douglas W., 1991, "Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt", Journal of Political Economy 99, 689-721.

Fama, Eugene F., 1985, "What's Different about Banks?",Journal of Monetary Economics 10, 10-19.

Field, Laura C. and Jonathan M. Karpoff, 2002, "Takeover Defenses of IPO Firms", Journal of Finance 57, 1857-1889.

Field, Laura C. and Michelle Lowry, 2009, "Institutional Versus Individual Investments in IPOs: The Importance of Firm Fundamentals", Journal of Financial and Quantitative Analysis 44, 489-516.

Fields, L. Paige, Donald R. Fraser, Tammy L. Berry, and Steven Byers, 2006, "Do Bank Loan Relationships Still Matter?",Journal of Money, Credit, and Banking 38, 1195-1209.

Friedlan, Jogn M., 1994, "Accounting Choices of Issuers of Initial Public Offerings", Contemporary Accounting Research 11, 1-23.

Gonzalez, Laura and Christopher James, 2007, "Banks and Bubbles: How Good are Bankers at Spotting Winners?", Journal of Financial Economics 86, 40-70.

Hauswald, Robert and Robert Maequez, 2006, "Competition and Strategic Information Acquisition in Credit Markets", Review of Financial Studies 19, 967-1000.

Jain, Bharat A. and Omesh Kini, 1994, "The Post-Issue Operating Performance of IPO Firms", Journal of Finance 49, 1699-1726.

James, Christopher, 1987, "Some Evidence of the Uniqueness of Bank Loans", Journal of Financial Economics 19, 217-235.

Kane, Edward J., and Burton G. Malkiel, 1965, "Bank Portfolio Allocation, Deposit Variability, and the Availability Doctrine", Quarterly Journal of Economics 79, 113-134.

Leland, Hayne E. and David H. Pyle, 1977, "Information Asymmetries, Financial Structure and Financial Intermediaries", Journal of Finance 32, 371-387.

Lin, Hsiou-wei and Maureen F. McNichols, 1998, "Underwriting Relationships, Analysts' Earnings Forecasts and Investment Recommendations", Journal of Accounting and Economics25, 101–127.

Loughran, Tim and Jay R. Ritter, 1995, "The New Issues Puzzle", Journal of Finance 50, 23-52.

Loughran, Tim and Jay R. Ritter, 2004, "Why has IPO Underpricing Increased Over Time?", Financial Management 33, 5-37.

Lummer, Scott L. and John J. McConnell, 1989, "Further Evidence on the Bank Lending Process and the Capital Market Response to the Bank Loan Agreements", Journal of Financial Economics 25, 99-122.

Michaely, Roni and Kent L. Womack, 1999, "Conflict of Interest and the Credibility of Underwriter Analysts Recommendations", Review of Financial Studies12, 653–686.

Mikkelson, Wayne H. and M. Megan Partch, 1986, "Valuation Effects of Securities Offerings and the Issuance Process", Journal of Financial Economics 15, 31-60.

Mikkelson, Wayne H., M. Megan Partch, and Kshitij Shah, 1997, "Ownership and Operating Performance of Companies that Go Public", Journal of Financial Economics 44, 281-307.

Rajan, Raghuram and Henri Servaes, 1997, "Analyst Following of Initial Public Offerings", Journal of Finance 52, 507-529.

Rajan, Raghuram and Andrew Winton, 1995, "Covenants and Collateral as Incentives to Monitor", Journal of Finance 50, 1113-1146.

Ramakrishan, Ram T.S. and Anjan V. Thakor, 1984, "Information Reliability and a Theory of Financial Intermediation", Review of Economic Studies 51, 415-432.

Ritter, Jay R. and Ivo Welch, 2002, "A Review of IPO Activity, Pricing, and Allocations", Journal of Finance 57, 1795-1828.

Schenone, Carola, 2004, "The Effect of Banking Relationships on the Firm's Cost of Equity in its IPO", Journal of Finance 59, 2901- 2958.

Teoh, Siew H., Ivo Welch, and T.J. Wong, 1998, "Earnings Management and the Long-run Performance of Initial Public Offerings", Journal of Finance 53, 1935-1974.

Teoh, Siew H. and T.J. Wong, 2002, "Why New Issues and High-Accrual Firms Underperform: The Role of Analysts' Credulity", Review of Financial Studies 15, 869-900.

Teoh, Siew H., T.J. Wong, and Gita R. Rao, 1998, "Are Accruals During Initial Public Offerings Opportunistic?", Review of Accounting Studies 3, 175-208.