

The Information Content of Negative Book Value

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In modern economy where off-balance-sheet intangible assets are abundant, the relevance of negative book value warrants attention. This study examines the stock market's response to first-time negative book value reporting by firms that have maintained positive book value for many years. By analyzing these firms' size-adjusted cumulative abnormal returns around preliminary earnings announcement dates and 10-K filing dates, we find that stock prices respond negatively to first-time negative book value reporting and that such response is incremental to the market's response to earnings announcements. Furthermore, the market's incremental response is weaker for firms in industries with higher off-balance-sheet intangible assets.

Keywords: book value, negative book value, information content, off-balance-sheet intangible assets, earnings announcement, 10-K filing

INTRODUCTION

A firm's book value of equity represents its common shareholders' residual claim against its assets. When the firm's total liabilities exceed its total assets, negative book value will appear in the balance sheet. While book value normally is expected to be positive, the number of negative book value firms has increased significantly since the early 1980s. Jan and Ou (2012) documented this increasing trend and reported that among all Compustat firms, the percentage of negative book value firms had increased from an annual average of five percent during the decade 1976-1985 to nearly fifteen percent during the decade 1996-2005.¹ As negative book value becomes more common, there is a need for investors and researchers to seek deeper understanding of these firms. It no longer seems appropriate to treat negative book value firms as anomalies and simply drop them from research samples, as frequently done by accounting researchers in the past.

In the traditional, tangible-asset-based economy, firms with negative book value were commonly regarded as in financial distress or on the brink of failure. With the arrival of the new economy in the last decades of the 20th century, a great many firms became highly knowledge-based, requiring significant investment in human capital in order to generate intangible assets that are essential for successful operation. However, financial reporting standards such as generally accepted accounting principles (GAAP) in the U.S. require that investments in human capital and many other expenditures (for example R&D and advertising) that have the potential to generate future economic benefits be treated as expenses

in the period they are incurred. This accounting treatment inevitably leads to significant amount of intangible values being excluded from balance sheet assets (as well as book value of equity) of knowledge-based firms. The increasing frequency of firms reporting negative book value since the 1980s is likely a reflection of this scenario. Consequently, the implication of having negative book value nowadays could be rather different from that in the past. One might plausibly suspect that having negative book value today does not matter as much as it did many decades ago.

Our interest in studying negative book value firms has been motivated by our curiosity over the question: “Does negative book value matter to the investors?”, and if it does, in what ways, under what circumstances, and to what extent does it matter? These questions can be addressed from different angles. For instance, what are negative book value firms’ odds of survival? Does the capital market price these firms differently from the way it prices positive book value firms? How does stock price react when a firm’s book value drops from positive to negative? Does negative book value convey additional information beyond the firm’s negative earnings? Jan and Ou (2012) studied negative book value firms from the first two perspectives. They found that more than half of the negative book value firms in their sample were able to survive at least five years after their first-time reporting of negative equity, and many of these firms continued to have negative book value for many years without going out of business. In addition, they reported that the market on average prices each dollar of negative book value firms’ assets higher than that of positive book value firms. These findings indicate that many negative book value firms are not in financial distress and the capital market does not price them as such either.

In this study, we investigate if negative book value matters from another perspective: the stock market’s reaction to a firm’s reporting of negative book value after having maintained positive book value for many years. Our main research question is whether the news of a firm’s falling into negative book value for the first time will trigger a negative reaction of the stock market, and whether such reaction, if exists, is in addition to the market’s reaction to the firm’s current earnings (most likely negative earnings) announcement. In other words, we study whether stock prices behave as if the capital market views a firm’s first-time reporting of negative book value as an information event that conveys additional bad news about the firm’s future that has not been incorporated in the firm’s earnings announcement. While in modern economy many negative book value firms do have the safety cushion of their unrecorded intangible assets, a firm’s beginning to report negative book value of equity could still be interpreted by market participants as bad news that bears negative implications for the firm’s future. For instance, having negative equity might trigger violation of debt covenants, increase the risk of being delisted by the stock market, raise more scrutiny by creditors and lending institutions, or be put under regulatory agencies’ close watch. Moreover, to the extent that there are incentives for firms to want to try their best to avoid reporting negative shareholders’ equity in their balance sheets through some schemes of “book value management”, a firm’s abandonment of such effort (thus allowing book value to drop to negative) could also be interpreted by the market as a negative signal of the managers’ pessimism about the firm’s future.

Many negative book value firms in a given year have already had negative book value in the previous year or have been hovering between negative and positive book values over the years. These firms’ reporting another year of negative equity might not be very newsworthy and its implication can be ambiguous. For this reason, our study focuses on firms that report negative book value “for the first time.” To accommodate the constraint in available data-years, in this study we define first-time negative book value firms as firms that have had positive book value in all of the previous five years before reporting negative book value in the current year. Our first-time negative book value sample includes all such Compustat firms² in the thirty-year test period 1984-2013. This way of designating our negative book value sample also has the desirable effect of excluding very young firms whose negative book value might be interpreted differently by the equity market.

Since most negative book value firms are loss firms³ and these firms’ current (negative) earnings have been closed into their retained earnings, a key component of total shareholders’ equity, a firm’s negative book value and its current (negative) earnings inevitably contain overlapping information about the firm. To examine stock price’s response to the information conveyed by first-time negative book value

reporting, it is therefore important that the effect of current earnings is controlled. In this study we identify from our first-time negative book value sample a subset of firms that have a minimum time lag of two days between their preliminary earnings announcement date and their 10-K report filing date, which is the formal disclosure date of a firm's book value in its balance sheet. We observe each of these firms' abnormal stock return surrounding its preliminary earnings announcement date and that around its 10-K report filing date, respectively. Since these firms' stock prices have already reflected their earnings information at the time of preliminary earnings announcement, the market's incremental reaction to their first-time negative book value reporting can then be examined by observing the stock returns around their 10-K filing dates.⁴ For comparison purposes, we also observe the abnormal returns around these two dates of a contrasting sample of firms that have positive book value in the current year and in each of the previous five years. To further control for the confounding effect of current earnings, we also use regression analysis to examine the incremental information content of first-time negative book value reporting over current earnings.

Our test results indicate that the stock market does react negatively to first-time reporting of negative book value, and that this reaction is incremental to the market's response to the information in current earnings (losses). We find that the 3-day size-adjusted cumulative abnormal return of our first-time negative book value firms is significantly negative around earnings announcement, reflecting the bad news in earnings. Moreover, the 3-day size-adjusted cumulative return is also significantly negative around these firms' 10-K filing dates when the news of their falling from positive book value down to negative for the first time is revealed in the disclosure of their complete financial statements. The results of our regression analysis are consistent with the finding that first-time negative book value reporting does convey incremental information about the firm beyond its current earnings.

We next examine the impact of the level of a firm's off-balance-sheet intangible assets on the strength of the stock market's reaction to the firm's first-time negative book value reporting. As documented in Jan and Ou (2012), not all negative book values are caused by unsuccessful operations. Oftentimes they are results of mandatory expensing of large amounts of value-creating expenditures such as R&D and advertising.⁵ Many firms have very low or negative book-to-market ratio because of this, or because much of their internally generated intangible value such as brand name, superior business model or loyal customer base cannot be capitalized in the balance sheet under current financial reporting standards. If capital market participants regard these off-balance-sheet intangible values as an integral part of a firm's true asset base, they are likely to consider first-time negative book value reported by firms that they believe to have high amount of off-balance-sheet assets less alarming than that reported by firms low in these hidden assets.⁶ Should this be the case, one would expect the stock market's negative reaction to first-time negative book value reporting to be stronger for firms with low off-balance-sheet intangible assets than their counterpart.

Since the amount of a firm's off-balance-sheet intangible assets cannot be directly measured, we use each of our sample firm's industry classification to proxy for its level of hidden intangible value as perceived by the investors. To do this, we first select individual industries into a high hidden asset industry group and a low hidden asset industry group based on each industry's median book-to-market ratio and its average percentage of firms having negative book value.⁷ We then assign our first-time negative book value sample firms to a high unrecorded intangible asset subsample and a low unrecorded intangible asset subsample according to the high-low hidden asset classification of their respective industries. In this setting, we compare the stock price's response to first-time negative book value reporting by these two groups of firms. Our result shows that in general stock price reacts more strongly to such reporting made by firms that are perceived to have low off-balance-sheet intangible assets.

Seeking to gain further insights into negative book value firms and to find answers to the question of whether having negative book value matters in the modern economy, this study examines the stock market's response to a firm's first-time reporting of negative book value and whether such response is sensitive to the investors' perception of how much off-balance-sheet intangible assets the firm has. Capital market accounting research for a long time has mostly focused on the information content of earnings (including negative earnings) and earnings components in the income statement. This study

draws attention to the balance sheet and provides some evidence on the information content of book value of equity, a key figure of the balance sheet, in the specific scenario of first-time negative book value reporting.

The rest of the paper is organized as follows: The next section describes our data and sample, and provides some descriptive statistics. We then report our empirical findings and conclude.

DATA AND SAMPLE DESCRIPTION

We retrieve financial statement data from the Compustat fundamental annual file and stock daily returns data from CRSP through the Wharton Research Data Services (WRDS). We identify a firm's industry based on the 48-industry classification in Fama and French (1997).⁸ Firms in five of these industries (utilities, banking, insurance, real estate, and trading) are excluded from our initial sample.

Book value (BV) is defined as total common equity (item "ceq" in Compustat). For each fiscal year in our thirty-year test period, 1984-2013, we select firms with negative book value (NegBV) and from which collect our first-time negative book value (FstNegBV) sample. A NegBV firm is identified as a FstNegBV firm if its book value is negative in the current year, but was non-negative in each of the previous five years. For comparison purposes, a contrasting sample of all positive book value (AllPosBV) firms is also constructed for each year. A firm is identified as an AllPosBV firm if its book value is non-negative in the current year and in each of the previous five years. Our initial sample includes 173,480 firm/year observations that have book value data available for six consecutive years (i.e., the current and the previous five years) over the period 1984 to 2013.⁹ Of these observations, 2,599 are FstNegBV and 91,392 are AllPosBV observations.¹⁰

Table 1 reports the number and the percentage of negative book value firms in our initial sample in each of the thirty years. Consistent with Jan and Ou (2012), we also find an increasing trend over time in the percentage of firms reporting negative book value: from 6.04% in 1984 to 18.95% in 2013, with an average of 14.54% per year. This table also shows the number and the percentage of each year's NegBV firms that report negative book value for the first time after reporting at least five consecutive years of non-negative book value. These 2,599 first-time negative book value observations constitute the main test sample of this study, FstNegBV. On average, 11.06% of each year's NegBV firms are first-time negative book value firms.

TABLE 1
NEGATIVE BOOK VALUE REPORTING (1984-2013)

Year	Number of All Obs ¹	Negative Book value (NegBV) Reporting ²		First-Time Negative Book Value (FstNegBV) Reporting ³	
		Number	% of All Firms	Number	% of NegBV Firms
1984	5,332	322	6.04%	53	16.46%
1985	5,641	464	8.23%	82	17.67%
1986	5,860	523	8.92%	80	15.30%
1987	5,824	538	9.24%	88	16.36%
1988	5,650	583	10.32%	95	16.30%
1989	5,520	639	11.58%	102	15.96%
1990	5,536	704	12.72%	117	16.62%
1991	5,657	710	12.55%	97	13.66%
1992	5,959	725	12.17%	89	12.28%
1993	6,260	642	10.26%	75	11.68%
1994	6,552	670	10.23%	66	9.85%
1995	7,278	870	11.95%	62	7.13%

1996	7,411	751	10.13%	88	11.72%
1997	7,232	815	11.27%	101	12.39%
1998	7,376	1,201	16.28%	127	10.57%
1999	7,321	1,187	16.21%	108	9.10%
2000	6,965	1,090	15.65%	123	11.28%
2001	6,479	1,265	19.52%	163	12.89%
2002	6,108	1,271	20.81%	139	10.94%
2003	5,828	1,171	20.09%	89	7.60%
2004	5,609	1,028	18.33%	74	7.20%
2005	5,412	987	18.24%	63	6.38%
2006	5,158	880	17.06%	71	8.07%
2007	4,929	722	14.65%	53	7.34%
2008	4,675	813	17.39%	122	15.01%
2009	4,552	853	18.74%	73	8.56%
2010	4,455	815	18.29%	47	5.77%
2011	4,386	842	19.20%	56	6.65%
2012	4,388	929	21.17%	52	5.60%
2013	4,127	782	18.95%	44	5.63%
Total	173,480	24,792	14.54% ⁴	2,599	11.06% ⁴

¹ Sample firms include all U.S. non-utility and non-financial firms that have book value data (item “ceq”) of current year available on Compustat.

² Firms whose reported book value is lower than zero in the current year.

³ Firms that report negative book value for the first time after reporting five consecutive years of non-negative book value.

⁴ Average of annual percentages over 1984-2013.

Table 2 presents negative book value reporting within individual industries.¹¹ Panel A of Table 2 shows, for each industry, the average number of firms per year, the average number of NegBV firms per year, and the average percentage of NegBV firms per year over the test period. Sorting industries by their NegBV percentages from high to low, Panel A reveals a general pattern: The industries that are commonly perceived as having more off-balance-sheet intangible assets, such as communication, healthcare/pharmaceutical, and personal/business services, are among the industries that have a larger proportion of firms reporting negative book value. Firms in these industries are more knowledge-based, with significant investments in R&D and employee talents. These investments and much of the value they generate cannot be capitalized as assets in the balance sheet. On the other hand, traditional industries such as construction, textiles, retail, and wholesale have much lower percentage of firms reporting negative book value.

Panel B of Table 2 reports the distribution of the 2,599 FstNegBV observations among individual industries. It shows the number and the percentage of these observations that come from each industry. It is noteworthy that nearly 40% of these FstNegBV firms are from the top three industries in the table: (1) personal and business services, (2) healthcare, medical equipment and pharmaceutical products, and (3) business equipment. The remaining FstNegBV firms scatter over the rest of the industries. Personal and business services, the industry with highest number of FstNegBV observations, include a broad range of service firms such as advertising, computer programming, data processing, equipment leasing, auto and equipment repair, educational and social services, etc. The healthcare industry includes firms engaging in manufacturing drugs in pharmaceutical preparations. The business equipment industry includes manufacturers of computers, electronic equipment, and lab equipment. Given that firms in these industries are commonly believed to have valuable assets hidden from their balance sheets, the stock market could be more forgiving when the book value of these firms fall below zero for the first time.

TABLE 2
NEGATIVE BOOK VALUE REPORTING BY INDUSTRY (1984-2013)

Panel A: Average Annual Frequency of Negative BV Reporting in Each Industry			
Industry Name ¹	No. of All Firms ²	No. of NegBV Firms ²	NegBV % ³
Tobacco products	6	2	23.1%
Precious metals, non-metallic, industrial metal mining	69	16	22.5%
Communication	235	51	22.1%
Rubber and plastic products	68	12	19.4%
Recreation	190	32	18.0%
Healthcare, medical equipment, pharmaceutical	739	131	17.2%
Personal and business services	908	157	16.7%
Chemicals	125	19	14.9%
Printing and publishing	69	9	14.8%
Automobiles and trucks	92	13	14.6%
Coal	13	2	14.5%
Consumer goods	111	14	13.9%
Restaurant, hotels, motels	140	19	13.6%
Electrical equipment	101	13	13.5%
Fabricated products and machinery	248	30	12.4%
Petroleum and natural gas	299	36	12.1%
Business equipment	774	93	12.1%
Transportation	161	18	11.7%
Aircraft, ships, and railroad equipment	45	5	11.4%
Steel works, etc.	86	9	11.2%
Wholesale	265	26	9.8%
Retail	340	33	9.8%
Business supplies and shipping containers	93	8	8.9%
Food	145	12	8.8%
Textiles	38	3	8.6%
Construction and construction materials	210	18	8.4%
Apparel	81	7	8.3%
Beer & liquor	18	2	8.2%
Other	116	36	31.1%

Panel B: Industry Distribution of First-Time Negative BV Firm/Year Observations

Industry Name	FstNegBV Observations	
	Number of Obs.	Percentage in each Industry
Personal and business services	362	13.9%
Healthcare, medical equipment, pharmaceutical products	343	13.2%
Business equipment	318	12.2%
Petroleum and natural gas	157	6.0%
Retail	151	5.8%
Communication	125	4.8%
Recreation	107	4.1%
Wholesale	103	4.0%
Fabricated products and machinery	101	3.9%
Construction and construction materials	96	3.7%
Restaurant, hotels, motels	73	2.8%
Transportation	62	2.4%
Steel works, etc.	59	2.3%
Chemicals	55	2.1%
Electrical equipment	48	1.8%
Consumer goods	43	1.7%
Automobiles and trucks	40	1.5%
Precious metals, non-metallic, industrial metal mining	37	1.4%
Rubber and plastic products	37	1.4%
Apparel	36	1.4%
Business supplies and shipping containers	34	1.3%
Food	33	1.3%
Printing and publishing	31	1.2%
Aircraft, ships, and railroad equipment	23	0.9%
Textiles	15	0.6%
Coal	8	0.3%
Tobacco products	2	0.1%
Beer & liquor	1	0.0%
Other	99	3.8%
Total	2,599	100.0%

¹ As a preliminary analysis, we classify industries into 29 based on the 30-industry classification codes posted on K.R. French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. We exclude utilities and financials, but add rubber and plastic products industry with SIC codes 3031 to 3099.

² Average number of firms per year in the industry over 1984-2013.

³ Average annual percentage of negative book value firms in the industry over 1984-2013. Industries are sorted by NegBV% from high to low.

Since a firm's book value at year-end has incorporated its earnings (or loss) of the current year, to examine the impact of first-time negative book value reporting on stock prices we must isolate it from the information effect of current earnings. A firm's annual report information typically becomes available to the public on two separate dates: the preliminary earnings announcement date (EA) and the 10-K SEC EDGAR filing date (FD). Current year's earnings performance is announced on EA, and then the full set of annual financial statement data, including book value of equity, becomes available on FD. For each

year we classify our FstNegBV and AllPosBV sample firms into Prelim firms and Filer firms based on whether the firm has made preliminary earnings announcement before it files 10-K with the SEC.¹² A firm is classified into the Prelim sample if both dates, EA and FD, are available and EA is at least two days earlier than FD. A firm is designated a Filer if FD is available but EA is either missing or not made at least two days before FD. We retrieve our sample firms' EA from Compustat fundamental quarterly file (item "rdq" for the fourth fiscal quarter) and FD from the Co_Filedate file (item "filedate"). Of all Prelim firms in our sample, the median number of days between EA and FD over the entire test period is 34 days.¹³

Table 3 presents the classification of the Prelim and Filer firms for the FstNegBV and the AllPosBV samples, respectively. Of all FstNegBV firms with at least FD available, 661 (28.6%) are Prelims, 1,647 (71.4%) are Filers, which either have EA missing or have earnings announcement less than two days before FD (i.e., only one day earlier, right on FD, or even after FD). On the other hand, of the AllPosBV sample firms with at least FD available, 70.7% are Prelims and only 29.3% are Filers. This sharp contrast reveals a likely self-selection bias: the FstNegBV firms appear to have strong incentive to avoid making early disclosure of their earnings before filing complete annual report on FD. To look into the probable cause of this incentive, we compare the current earnings profiles of the Prelim firms and the Filer firms and report the results in Table 4.

TABLE 3
NUMBER AND PERCENTAGE OF PRELIM FIRMS AND FILER FIRMS (1984-2013)

	FstNegBV Firms ¹		AllPosBV Firms ¹	
	No. of Observations	% of all FstNegBV	No. of Observations	% of all AllPosBV
Prelim Firms ²	661	28.6%	59,676	70.7%
Filer Firms ²				
EA less than 2 days before FD	1,050		16,569	
EA missing	597	1,647	8,122	24,691
Total prelim and filer firms	2,308	100.0%	84,367	100.0%
Both EA and FD are missing	186		2,115	
FD missing	105		4,910	
Total observations	2,599		91,392	

¹ FstNegBV firms are those reporting negative book value for the first time after reporting five consecutive years of positive book value; AllPosBV firms are those continue to report positive book value after reporting five consecutive years of positive book value.

² Prelim firms are firms that have both earnings announcement date (EA) and 10-K filing date (FD) available on Compustat and EA is at least two days earlier than FD; Filer firms are firms that have FD available, but EA is not made at least two days earlier than FD, or is missing.

Table 4 compares two current earnings-based performance measures between the Prelim firms and the Filer firms: earnings change from the previous year, scaled by the absolute value of the previous year's earnings (in Panel A) and return on total assets (in Panel B).¹⁴ The top section of each Panel shows the results based on a pooled sample of the FstNegBV and the AllPosBV firms. In both earnings change and return on total assets, the Prelim firms significantly outperform the Filer firms at the 1% significance level (with $t = 23.04$ and $t = 59.06$, respectively). The lower sections of each Panel present these measures for the FstNegBV sample and the AllPosBV sample separately. The results show that the Prelim firms

consistently outperform the Filer firms in both measures within both the FstNegBV and the AllPosBV samples.¹⁵ In sum, Table 4 shows that there is a positive association between a firm's current-year earnings performance and its likelihood of making preliminary earnings announcement before filing 10-K report. Since presumably all FstNegBV firms have negative current earnings, there could be incentive for many of them to avoid early disclosure of the earnings bad news by not making preliminary earnings announcement. This gives a plausible explanation to why the majority of FstNegBV firms are Filers while the majority of AllPosBV firms are Prelim firms.

TABLE 4
COMPARISON OF PROFITABILITY BETWEEN PRELIM FIRMS AND FILER FIRMS
(1984-2013)

Panel A: Earnings Change¹					
	No. of Obs	Mean	Median	Std. Error	t (mean=0)
All Firms					
Prelim Firms ²	59,248	-0.0073	0.1304	0.0117	-0.62
Filer Firms ²	25,441	-0.6691	-0.0074	0.0262	-25.52***
Difference in Mean: t=23.04***					
FstNegBV Firms³					
Prelim Firms	640	-3.0921	-0.3384	0.3436	-9.00***
Filer Firms	1,603	-3.7169	-0.5662	0.2463	-15.09***
Difference in Mean: t=1.48					
AllPosBV Firms³					
Prelim Firms	58,608	0.0264	0.1330	0.0112	2.36**
Filer Firms	23,838	-0.4641	0.0169	0.0219	-21.17***
Difference in Mean: t=19.94***					
Panel B: Return on Total Assets⁴					
	No. of Obs	Mean	Median	Std Error	t (mean=0)
All Firms					
Prelim Firms	60,325	0.0627	0.0832	0.0007	91.11***
Filer Firms	26,185	-0.0744	0.0127	0.0022	-33.56***
Difference in Mean: t=59.06***					
FstNegBV Firms					
Prelim Firms	660	-0.2432	-0.0754	0.0232	-10.48***
Filer Firms	1,628	-0.4639	-0.2217	0.0188	-24.74***
Difference in Mean: t=7.40***					
AllPosBV Firms					
Prelim Firms	59,665	0.0661	0.0841	0.0006	104.37***
Filer Firms	24,557	-0.0486	0.0211	0.0019	-25.57***
Difference in Mean: t=57.27***					

¹ Earnings are income before extraordinary items (item "ib" in Compustat). Earnings change is current earnings minus the previous year's earnings, scaled by the absolute value of the previous year's earnings. Observations with earnings change in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis.

² Prelim firms are firms that have both earnings announcement date (EA) and 10-K filing date (FD) available on Compustat and EA is at least two days earlier than FD; Filer firms are firms that have FD available, but EA is not made at least two days earlier than FD, or is missing.

³ FstNegBV firms are those reporting negative book for the first time after reporting five consecutive years of positive book value; AllPosBV firms are those continue to report positive book value after reporting five consecutive years of positive book value.

⁴ Return on total assets (ROA) is operating income after depreciation (item "oiadp" in Compustat), divided by average total assets. (item "at"; total assets must be greater than zero.) Observations with ROA in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis.

***: Statistically significant at 1% level

**: Statistically significant at 5% level.

EMPIRICAL RESULTS

Our main findings are presented in two parts. In the first part we report stock price's incremental response to a firm's first-time reporting of negative book value over the response to its preliminary earnings announcement. In the second part we report the sensitivity of this price reaction to the investors' perception of the amount of off-balance-sheet intangible assets a first-time negative book value firm has.

Incremental Information Content of First-Time Negative Book Value Reporting

Our goal is to investigate whether a firm's first reporting of negative book value following many years of having positive book value conveys additional information not already available in its current earnings (most likely losses). To isolate the market's reaction to book value reporting from its response to earnings announcement, our stock return study focuses on those FstNegBV firms that have made preliminary earnings announcement at least two days before filing 10-K (i.e., the Prelim firms). These firms' stock returns at the time when their book values become available in the balance sheets on their 10-K filing dates (FD) should be independent of the market's response to their current earnings, which have already taken place around the preliminary earnings announcement dates (EA). For comparison purposes, we also monitor stock returns of our AllPosBV sample at EA and FD.

To measure stock price reaction, we calculate the 3-day size-adjusted cumulative abnormal return (CAR) for the FstNegBV sample and the AllPosBV sample around EA and FD, respectively. CAR is the sum of size-adjusted return from -1 to +1 day of EA or FD, where size-adjusted return is the difference between the daily return (including dividends) of a firm and the firm's decile portfolio return.^{16,17} Observations with CAR in the top and the bottom 1% of the FstNegBV sample and the AllPosBV sample are excluded from the analysis.

Table 5 presents the 3-day size-adjusted CAR around EA and FD for the Prelim firms and around FD for the Filer firms. Panel A reports the results based on a combined sample of all FstNegBV and AllPosBV firms with returns data available. As expected, we find that for Prelim firms, the market responses take place only around earnings announcement, with mean 3-day size-adjusted CAR being significantly positive, but not on the 10-K filing date (FD). Since the observations in this pooled sample are predominantly AllPosBV firms, it is not surprising that stock prices only react to earnings announcement on EA but not to the reporting of another year of positive book value on FD. The significantly positive CAR on EA is consistent with our earlier finding (in Table 4) that the Prelim firms are better performers in current earnings. On the other hand, for the Filer firms, whose current earnings are not available until FD (or one day before FD), market reaction does take place around FD and the 3-day CAR is significantly negative. This result is also consistent with our finding that on average the Filer firms are poor performers in current earnings.

TABLE 5
COMPARISON OF CUMULATIVE SIZE-ADJUSTED RETURNS AROUND EARNINGS
ANNOUNCEMENT DATE AND 10-K FILING DATE (1984-2013)

Panel A – CAR¹: Prelim Firms and Filer Firms²				
Earnings Announcement Date (EA)				
	No. of Obs.	Mean	Median	t (mean=0)
Prelims	57,891	0.0047	0.0017	15.20***
10-K Filing Date (FD)				
	No. of Obs.	Mean	Median	t (mean=0)
Prelims	58,121	0.0001	-0.0008	0.49
Filers	16,026	-0.0020	-0.0022	-3.37***
Difference in Mean: t=3.34***				
Panel B – CAR: Prelim Firms				
Earnings Announcement Date (EA)				
	No. of Obs.	Mean	Median	t (mean=0)
FstNegBV ³	505	-0.0112	-0.0047	-2.08**
AllPosBV ³	57,386	0.0049	0.0018	15.69***
Difference in Mean: t=2.98***				
10-K Filing Date (FD)				
	No. of Obs.	Mean	Median	t (mean=0)
FstNegBV	493	-0.0095	-0.0108	-2.15**
AllPosBV	57,628	0.0002	-0.0008	0.90
Difference in Mean: t=2.19**				
Panel C – CAR: Filer Firms				
10-K Filing Date (FD)				
	No. of Obs.	Mean	Median	t (mean=0)
FstNegBV	544	-0.0135	-0.0143	-2.35**
AllPosBV	15,482	-0.0016	-0.0020	-2.75***
Difference in Mean: t=2.19**				

¹ CAR is 3-day cumulative size-adjusted return around earnings announcement date (EA) or filing date (FD). Size-adjusted return is the difference between the firm's daily returns ("ret" in CRSP) and its size-decile returns (item "decret" from CRSP erdport1 file). CAR is the sum of size-adjusted returns from -1 to +1 day of EA or FD. Observations with CAR in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis.

² Prelim firms are firms that have both earnings announcement date (EA) and 10-K filing date (FD) available on Compustat and EA is at least two days earlier than FD; Filer firms are firms that have FD available, but EA is not made at least two days earlier than FD, or is missing.

³ FstNegBV firms are those reporting negative book for the first time after reporting five consecutive years of positive book value; AllPosBV firms are those continue to report positive book value after reporting five consecutive years of positive book value.

***: Statistically significant at 1% level

**: Statistically significant at 5% level.

Panel B of Table 5 reports one of the key findings of this study. Here we present the Prelim firms' 3-day CAR around EA and FD, with the FstNegBV sample and the AllPosBV sample separately reported. For the FstNegBV firms, not only the 3-day CAR is significantly negative around earnings announcement, reflecting the bad news in earnings, it is also significantly negative (with t-value = 2.15)

around 10-K filing date when first-time negative book value is revealed in the balance sheet. This result supports the notion that a firm's first-time negative book value reporting conveys incremental (negative) information about the firm beyond information contained in its current earnings. In contrast, for the AllPosBV firms, although CAR is significantly positive around earnings announcement, it is insignificantly different from zero around the 10-K filing date. This is consistent with our conjecture that a firm's reporting yet another year of positive book value is not news-worthy to the investors.

Panel C of Table 5 reports the Filer firm's 3-day CAR around 10-K filing dates. Since these firms are relatively poor performers in current earnings and they did not release earnings information at least two days before filing 10-K reports, we expect negative price reactions around FD. We find that their mean 3-day CAR at FD is indeed significantly negative for both the FstNegBV and the AllPosBV samples. In addition, the market's negative response is significantly more negative for the FstNegBV firms than that for the AllPoBV firms (with $t = 2.19$). Overall, results reported in Table 5 suggest that stock market does respond negatively to first-time reporting of negative book value, and this reaction is incremental to its negative reaction to the information in current earnings.

We also perform regression analysis to examine the incremental information content of first-time negative book value beyond current earnings. Using our combined sample of the FstNegBV and the AllPosBV firms, we run linear regression for the 3-day size-adjusted CAR around EA and FD, respectively, based on the following model:

$$CAR = b_0 + b_1 \Delta Earnings + b_2 FstNegBV \quad (1)$$

The first independent variable, $\Delta Earnings$, is the change in "income before extraordinary items" from year $t-1$ to year t , scaled by fiscal year-end market value of common equity.¹⁸ The second independent variable, $FstNegBV$, is a dummy variable with $FstNegBV = 1$ for the firms that are members of the FstNegBV sample in year t and $FstNegBV = 0$ for the firms that are members of the AllPosBV sample in year t . The regression analysis is done separately for the Prelim firms and the Filer firms. For the Prelim firms, we run the regression first by using the 3-day CAR around EA and then by using the 3-day CAR around FD. For the Filer firms, the regression is done only for the 3-day CAR around FD.

The regression results are presented in Table 6. The first two columns report the results of regressing the Prelim firms' CAR around EA and around FD, respectively. For CAR around EA (Column 1), b_1 , the coefficient of $\Delta Earnings$, is positive and significant, yet b_2 , the coefficient of $FstNegBV$, is negative but insignificant. For CAR around FD (Column 2), b_1 is positive but insignificant, yet b_2 is negative and significant. These results show that the stock market does respond (in the expected direction) to changes in earnings at the time of earnings announcement, but the effect of earnings change no longer exists at the time of 10-K filing. On the other hand, the market does have a negative and significant response to first-time reporting of negative book value, and, very importantly, such response does not take place until the filing of 10-K, in which negative book value is reported in the balance sheet.

The last column of Table 6 reports the regression results of the Filer firms' CAR around FD. Here b_1 is significantly positive and b_2 is significantly negative. These results indicate that the market also responds negatively to the Filer firms' first-time reporting of negative book value, and this response is incremental to the effect of change in current earnings. Notably, the adjusted R^2 values of all of these regressions are quite low, most likely due to all kinds of noises in our regression setting. Nevertheless, the signs and the significance levels of the regression coefficients clearly indicate that the stock market does react negatively to a firm's first-time reporting of negative book value, and this reaction is incremental to its response to the information in current earnings. In sum, the findings reported in this subsection do lend support to the notion that a firm's falling from longstanding positive book value into negative book value is a news-worthy event that conveys additional information to the investors beyond the information in the firm's earnings.

TABLE 6
REGRESSION ANALYSIS: INCREMENTAL STOCK PRICE REACTION TO FstNegBV
 $CAR^1 = b_0 + b_1\Delta Earnings + b_2FstNegBV$
(1984 - 2013)

	Prelim Firms ²		Filer Firms ²
	Earnings Announcement Date	10-K Filing Date	10-K Filing Date
b ₀	0.0051	0.0002	-0.0010
t-stat	16.51***	0.89	-1.46
p-value	0.00	0.37	0.14
b ₁ : ΔEarnings ³	0.0140	0.0004	0.0022
t-stat	11.85***	0.57	3.09***
p-value	0.00	0.57	0.00
b ₂ : FstNegBV Dummy ⁴	-0.0039	-0.0106	-0.0099
t-stat	-1.14	-4.98***	-2.50**
p-value	0.25	0.00	0.01
Adjusted R ²	0.27%	0.05%	0.12%
Number of observations:	56,582	56,516	16,107
FstNegBV firms	490	478	530
AllPosBV firms	56,092	56,038	15,577

¹ CAR is 3-day cumulative size-adjusted return around earnings announcement date (EA) or filing date (FD). Size-adjusted return is the difference between the firm's daily returns ("ret" in CRSP) and its size-decile returns (item "decret" from CRSP erdport1 file). CAR is the sum of size-adjusted returns from -1 to +1 day of EA or FD. Observations with CAR in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis.

² Prelim firms are firms that have both earnings announcement date (EA) and 10-K filing date (FD) available on Compustat and EA is at least two days earlier than FD; Filer firms are firms that have FD available, but EA is not made at least two days earlier than FD, or is missing.

³ ΔEarnings is change in income before extraordinary items from year t-1 to year t, standardized by fiscal year-end market value of common equity.

⁴ FstNegBV=1 for FstNegBV firms that report negative book for the first time after reporting five consecutive years of positive book. FstNegBV=0 for AllPosBV firms that report six consecutive years of positive book value.

***: Statistically significant at 1% level

**: Statistically significant at 5% level.

The Impact of Hidden Intangible Assets on Stock Price Reaction

In this section, we report our investigation and findings on the effect of a firm's off-balance-sheet intangible assets on the stock market's reaction to its first-time negative book value reporting. If capital market participants regard a firm's off-balance sheet assets as an integral part of the firm's total assets, we expect the stock market's negative reaction to first-time negative book value reporting to be weaker for the firms with higher amounts of hidden assets. Given that a firm's unrecorded intangible assets (UIA) cannot be directly measured, an observable indicator is needed to proxy for investors' perception of each firm's level of UIA. Since the extent to which intangible values are hidden from the balance sheet differs across industries due to differences in the nature of their operations, we use each of our FstNegBV firm's

industry classification to proxy for the investors' perception of whether the firm has high or low level of hidden assets.

To do this, we first classify industries¹⁹ as a high UIA industry or a low UIA industry according to each industry's median fiscal year-end book-to-market (BM) ratio and its average annual percentage of member firms having negative book value (%NegBV). Based on the findings of Jan and Ou (2012), we expect high UIA industries to have lower BM ratio and higher %NegBV relative to low UIA industries.²⁰ To assign industries to a high UIA industry group and a low UIA industry group, we rank all industries by their median BM ratio and their average %NegBV from high to low, respectively. An industry is assigned to the high (low) UIA group if its BM is in the lower (upper) half of all industries and its % NegBV is in the upper (lower) half of all industries. Industries that do not satisfy these criteria are not classified.

Table 7 presents the composition of industries that are classified as high UIA (Panel A) and low UIA (Panel B). Consistent with our expectation, the 17 high UIA industries include those that tend to have high barriers to entry (e.g. tobacco products), high R&D expenditures (e.g. pharmaceutical products and computers), or high advertising (e.g. entertainment). On the other hand, the 17 industries in the low UIA group²¹ mostly include traditional industries such as textiles, construction, and apparel, which are relatively less involved in technologies. As shown at the bottom of Table 7, the high UIA industries had an average median BM ratio of 0.35 and on average 17.2% of their member firms were negative book value firms. On the other hand, the low UIA industries had an average median BM ratio of 0.61 and on average 9.6% of their member firms had negative book value.

TABLE 7
INDUSTRIES IDENTIFIED AS HAVING HIGH/LOW UNRECORDED INTANGIBLE ASSETS
(1984 - 2013)

Panel A: High Unrecorded Intangible Assets Industries¹			
Industry Name²	Number of Obs.	Median BM Ratio	% of NegBV
Tobacco Products	142	0.12	23.1%
Pharmaceutical Products	9,922	0.21	18.7%
Candy and Soda	348	0.25	15.8%
Precious Metals	955	0.26	22.6%
Nonmetallic Mining	853	0.28	23.1%
Telecommunications	5,113	0.29	22.1%
Medical Equipment	5,957	0.31	14.9%
Business Services	19,959	0.32	17.0%
Computers	7,041	0.38	15.0%
Printing and Publishing	1,261	0.40	15.5%
Healthcare	3,348	0.41	14.9%
Chemicals	3,225	0.41	14.9%
Personal Services	1,960	0.43	13.6%
Coal	343	0.43	14.5%
Entertainment	3,229	0.45	18.8%
Shipping Containers	449	0.47	14.2%
Restaurants, Hotel, Motel	3,464	0.48	13.6%
Total and Average	67,569	0.35	17.2%

Panel B: Low Unrecorded Intangible Assets Industries¹

Industry Name ²	Number of Obs.	Median BM Ratio	% of NegBV
Textiles	955	0.88	8.6%
Fabricated Products	629	0.74	9.0%
Construction	2,119	0.72	6.7%
Steel Works, Etc.	2,218	0.68	11.2%
Construction Materials	3,398	0.67	9.5%
Apparel	2,156	0.64	8.3%
Wholesale	6,510	0.60	9.8%
Business Supplies	2,023	0.59	7.6%
Aircraft	764	0.57	12.5%
Shipbuilding, Railroad Equipment	272	0.57	8.5%
Agriculture	613	0.56	6.8%
Transportation	3,769	0.56	11.6%
Retail	8,585	0.53	9.8%
Petroleum and Natural Gas	7,621	0.53	12.1%
Machinery	5,731	0.50	12.5%
Alcoholic Beverages	477	0.50	8.2%
Electronic Equipment	9,778	0.49	10.9%
Total and Average	57,618	0.61	9.6%

¹ Industries assumed to have high (low) unrecorded intangible assets (UIA) are those whose median book-to-market (BM) ratio at year-end is ranked in the lower (upper) half and whose average annual percentage of firms reporting negative book value (NegBV) over 1984 to 2013 is ranked in the upper (lower) half of all industries.

² Industries are classified into 48 based on Fama and French (1997), but exclude five in utilities and financial and one identified as "Other."

We separate our FstNegBV sample firms into a high UIA group and a low UIA group according to the high-low UIA classification of their respective industries.²² Table 8 reports the stock market's reaction to first-time negative book value reporting by firms in the high UIA industries and those in the low UIA industries, respectively. The results presented in this table are based only on our FstNegBV sample that are Prelim firms, firms that have both earnings announcement date and 10-K filing date available. Earlier we have shown in Table 5 that stock prices react negatively around the 10-K filing date to Prelim firms' first-time reporting of negative book value. Table 8 first recasts this result, and then reports the 3-day CAR surrounding the 10-K filing date for the FstNegBV firms in the high UIA group and those in the low UIA group separately.

First of all, our results in Table 8 show that the mean value of CAR on 10-K filing date is negative for FstNegBV reporting, regardless whether it is for firms in high UIA or in low UIA. However, it is statistically significant different from zero (at the 10% significant level) only for firms in the low UIA industries. In addition, the mean and the median CAR values of the low UIA group are more negative than those of the high UIA group, but the difference is not statistically significant ($t=0.94$). This insignificant result could be due to our UIA classification mechanism being imprecise, or it could be due to the investors' limited comprehension of the off-balance-sheet intangible values when pricing negative book value firms. Nevertheless, our test result suggests that the market's response to a firm's first-time negative book value reporting is sensitive to the firm's level of unrecorded intangible assets and that the market is more forgiving to first-time negative reporting by firms perceived to have higher amount of off-balance-sheet intangible assets.

TABLE 8
CUMULATIVE SIZE-ADJUSTED RETURNS FOR PRELIM FIRMS REPORTING NEGATIVE
BOOK VALUE FOR THE FIRST TIME

Industries with High versus Industries with Low Unrecorded Intangibles					
CAR: Filing Date¹					
Industry	Number of Obs.	Mean	Median	Std Error	t (mean=0)
All	493	-0.0095	-0.0108	0.0044	-2.15**
High UIA ²	276	-0.0059	-0.0101	0.0060	-0.98
Low UIA ²	157	-0.0153	-0.0078	0.0082	-1.87*
Difference in Mean:		t=-0.94			

¹ CAR is 3-day cumulative size-adjusted return around earnings announcement date (EA) or filing date (FD). Size-adjusted return is the difference between the firm's daily returns ("ret" in CRSP) and its size-decile returns (item "decret" from CRSP erdport1 file). CAR is the sum of size-adjusted returns from -1 to +1 day of EA or FD. Observations with CAR in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis.

² Industries assumed to have high (low) unrecorded intangible assets (UIA) are those whose median book-to-market (BM) ratio at year-end is ranked in the lower (upper) half and whose annual average percentage of firms reporting negative book value (NegBV) over 1984 to 2013 is ranked in the upper (lower) half of all industries.

** : Statistically significant at 5% level

* : Statistically significant at 10% level.

CONCLUSIONS

Empirical accounting research on the relationship between financial statement variables and stock prices since Ball and Brown (1968) has mostly focused on earnings, the summary figure of the income statement. In contrast, book value of equity, the summary figure of the balance sheet, has received far less attention. For instance, even though there has been a concurrent increasing trend over time in the proportion of firms that reported losses and the proportion of firms that reported negative book value, only loss firms have drawn accounting researchers' attention, which results in a rich literature of loss firm studies (Hayn, 1995; Joos and Plesko, 2005; Darrough and Ye, 2007; among others).

Two factors might partially explain researchers' lack of interest in a firm's reporting of negative book value. First, book value of equity is the sum of the firm's contributed capital and retained earnings, which is the firm's undistributed earnings from the current and the past years. It seems reasonable for one to be skeptical about the news value of negative book value disclosure when current and past earnings are already known to the public. Second, in a knowledge-based modern economy where many firms have substantial amount of off-balance-sheet intangible assets, having negative book value in the balance sheet does not necessarily mean that the shareholders have truly lost all of their equity in the firm. Nevertheless, beyond these factors, a firm's beginning to report negative book value could still be interpreted as bad news about its future. For instance, negative book value might trigger violation of debt covenants or raise more scrutiny by lending institutions, or it might even be interpreted as a negative signal of the management's pessimism about the firm's future so that they have given up trying to keep it positive. Therefore, whether negative book value matters and whether negative book value has incremental information content over earnings are empirical questions that deserve researchers' attention.

In this study, we examine the incremental information content of first-time negative book value reporting over current earnings announcement by observing the reaction of stock prices to its disclosure. We address this research question through a research design that focuses on a set of first-time negative book value firms that had a minimum time lag of two days between their earnings announcement dates and 10-K report filing dates. We observe each firm's cumulative size-adjusted stock returns around its earnings announcement date when earnings information is released, and then around its 10-K filing date when the full set of financial statements, including book value, is available to the stock market. This

approach allows us to isolate the effect of negative book value reporting from the effect of earnings (losses) announcement. Our empirical results show that the market appears to take first-time negative book value reporting seriously and reacts to it negatively. We also find that the market's reaction to first-time negative book value reporting is less negative for industries that are more likely to have higher amount of intangible assets not reported in the balance sheet.

Following Jan and Ou (2012), this study seeks further understanding of negative book value and negative book value firms. In this paper, we view a firm's first-time negative book value reporting as an information event and examine the stock market's response to this information event. Our being able to find incremental information content of this news event over current earnings announcement by applying a rather simple research design suggests that there could be much more value-relevant information in the balance sheet that is awaiting accounting researchers' discovery.

ENDNOTES

1. This increasing trend of negative book value echoes the increasing percentage of loss firms over time, as reported by a number of loss firm studies (Hayn (1995), among others).
2. Financial and utility firms are excluded.
3. Of all firms in our first-time negative book value sample, 95.1% report a loss in the current year and 96.3% report negative retained earnings in the current year.
4. A caveat of this research design is that some firms might have already voluntarily disclosed their book values at the time of preliminary earnings announcement or some other time before 10-K filing. However, this possibility can only lead to a downward bias of the magnitude of abnormal stock returns around 10-K filing dates.
5. Negative book value can also be caused by other events unrelated to a firm's operation, such as significant share buy-backs, large goodwill write-offs following mergers and acquisitions, and a major write-down of deferred tax assets. However, these are beyond the scope of this study.
6. Jan and Ou (2012) found that negative book value firms with high R&D expenditure on average could survive longer and were valued higher by the capital market than those with low R&D.
7. An industry is classified as a high (low) hidden asset industry if its book to market ratio is in the lower (upper) half of all industries and its percentage of firms reporting negative book value is in the upper (lower) half of all industries.
8. Fama and French (1997) divide firms into 48 industry groups based on each firm's 4-digit Standard Industrial Classification (SIC) code. Under this classification, the companies within each industry group are shown to be more economically related to each other in both stock return movements and sales growth than classification under traditional SIC codes (Chan *et al.* 2007).
9. Since identifying current year's FstNegBV and AllPosBV firms requires book value data of the previous five years, availability of pre-1984 book value data up to 1979 are also required for the first five years of our test period.
10. Under our definition of FstNegBV and AllPosBV firms, it is possible for a FstNegBV firm to be included in the FstNegBV sample more than once, albeit relatively infrequent (144 out of the 2,599 firm-year observations). On the other hand, it is quite common for an AllPosBV firm to stay in the ALLPosBV sample year after year.
11. Although we use the Fama-French 48-industry classification throughout the rest of this study, industries are classified into fewer groups simply for a more concise presentation of Table 2. Here we classify industries based on the 30-industry classification codes posted on K.R. French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. We exclude utilities and financials, but add rubber and plastic products industry with SIC codes 3031 to 3099.
12. We follow Amir and Livnat (2005) to classify firms into Prelim firms and Filer firms.
13. However, due to the SEC's shortened filing periods allowed for various types of filers under a rule that came in effect for the fiscal year ending on or after December 15, 2006, the median number of days between EA and FD has significantly dropped from 38 days in the period before fiscal year-end of 2006 to 18 days post 2006.
14. Earnings is income before extraordinary items (item "ib" in Compustat). Earnings change is current earnings minus the previous year's earnings, scaled by the absolute value of the previous year's earnings.

- Observations with earnings change in the top and bottom 1% of the FstNegBV sample and the AllPosBV sample, respectively, are excluded in the analysis. Return on total assets is calculated by dividing operating income after depreciation (item “oiadp”) by average total assets (item “at”).
15. The differences in mean of both measures between the Prelim and the Filer firms are all significant at 1% level, except that the t-value (1.48) of the difference in earnings change in the FstNegBV sample is not statistically significant.
 16. Decile portfolio return is value-weighted and deciles are assigned based on the market value of all NYSE, AMEX, and NASDAQ firms on the previous year-end (from CRSP enddport1 file).
 17. There are 62,120 (35.8%) observations with CAR missing around EA and 59,075 (34.1%) observations with CAR missing around FD.
 18. Market value of common equity is calculated as fiscal year-end closing price multiplied by the number of common shares outstanding (item “csho”).
 19. For this analysis, we use the 48-industry classification in Fama and French (1997), but exclude five in utilities and financial and one identified as “Other”. This “other” industry includes SIC codes from 4950 to 4991 (sanitary services, steam, air conditioning supplies, irrigation systems, and cogeneration).
 20. For each industry, we compute these two measures over our sample years and find a high correlation between them, with a spearman rank correlation of -0.77, statistically significant at the 1% level.
 21. The number of industries being the same for the high UIA and the low UIA groups is probably due to the strong correlation between BM ratio and percentage of firms having negative book value, or simply a coincidence.
 22. The FstNegBV firms whose industries have not been designated as either high or low UIA industries are not assigned to a group, and are dropped from the test sample when we compute CAR of the high UIA firms and the low UIA firms separately.

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