# Can Manager-Provided Fair Value Estimates Be Both Relevant and Reliable? Evidence from the United States Public Venture Capital Industry

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*This study examines accounting standard ASR 118 mandating the reporting of fair values of investment securities. Using a unique setting, the United States public venture capital industry, we test whether ASR 118 would be important to investors, or whether relevance would come at the expense of representational faithfulness. We examine the relevance and representational faithfulness of manager- reported fair value estimates and find that fair value estimates do provide relevant information incremental to historical cost as evidenced by its effect on share value. We also find that fair value estimates are representationally faithful, based on comparing fair value estimates provided during the last year before the exit to actual cash realized exit price.*

## I. INTRODUCTION

A constant theme in the accounting literature has been the debate over the use of historical cost accounting (HCA) versus the use of Fair Value Accounting (FVA). Proponents of FVA argue that HCA financial statements are not relevant because they do not provide information about current values. Proponents of HCA argue that the information provided by FV financial statements is unreliable[1]because it is not based on arms length transactions and may be subject to manipulation. Empiricists have explored these propositions, most often testing which valuation method offers the more relevant or reliable accounting figures. Consequently, the debate often mirrors that of the accounting principle of relevance versus that of reliability.

FASB concepts Statement 2 states that, "the primary qualities of accounting information are relevance and reliability, and that to be useful, information must possess both of these qualities." In September of 2010, FASB issued an explanatory concept Statement 8 redefining "reliability" as "representational faithfulness," so as to avoid ambiguity in the term.

However, as Robert R. Sterling argues, it is virtually impossible for accounting information to possess these two qualities to the same degree. He states:

> *Einstein drew a sharp and clear distinction between the certainty of calculation and the uncertainty of representation of phenomena: "As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality." The same is true for accounting: as far as the mathematical methods used in accounting refer to reality, they are not certain, as far as they are certain, they do not refer to reality. (Sterling 1985)*

In this paper, we show that for certain financial assets in the venture capital (VC) industry, that difficulty may be surmounted. We conduct our study in the public venture capital industry, employing a unique database of two hundred and fifty investments in start-up companies made by U.S. public venture capital funds for the years 1995 to 2008. Our sample ends in 2008 due to the noisy data elicited after the 2008 recession. We note that the sample includes the entire population of U.S. public VC firms that provide data covering the cash realized exit values (henceforth "exits") of the VC's funds.

Disclosure requirements for publicly traded VC funds provide a unique opportunity to examine the informational relevance of fair value accounting. Under Accounting Series Release (ASR) 118, VC funds are required to disclose investments in portfolio securities at fair value with the net change in fair values (i.e. unrealized gains and losses) included in the determination of net income. Additionally, these funds provide precise and finite cash flows of their investments, which allow for comparison purposes between estimated and actual values.

Previous studies have examined FVA for financial assets in comparison to HCA, but have generally shown that one is more relevant *or* more reliable than the other. In our study, we show that fair values can be both more relevant *and* more reliable than historical cost numbers. We test for each attribute independent of the other in order to isolate our findings.

First, we attempt to discover which valuation method objectively provides more *representationally faithful* numbers. In doing so we consider management-supplied fair values of investments, management forecasts, and employ tests of management forecast accuracy. This allows us to examine whether the management-supplied fair value figures of public venture capital funds' disaggregated investments are more useful in predicting future exit values than historical cost figures are. We define "exits" in four possible ways: IPO, sale, merger, or write-off, assuming that we have a measurable value. We then test the relationship between the real exit price of an investment and the manager- reported fair value from four quarters prior to the exit, to the day of the exit in order to test the accuracy (i.e. the *reliability*) of the manager's "forecast".

Second, we seek to establish that investment fair values are more *relevant* by exploring information relevance as perceived by the investor. Accordingly, we evaluate the market reaction to investments and investment gains and losses reported at fair value in comparison to those reported at cost.

With respect to the first part of our study we find that FVA numbers are significantly correlated with exit prices and indeed approach exit price as the time of the exit draws near. In contrast, we find that HCA numbers have very low correlation with exit prices.

Regarding the second part of our study, our findings are consistent with prior research[2] which shows that FVA estimates of investments provide significant explanatory power for changes in share prices, incremental to historical cost information. Furthermore, historical cost figures provide *no* incremental information relative to fair value numbers disclosed.

The estimated effect of investment gains and losses allows a direct comparison with the empirical results of the earning components literature (Barth et al. 1994, Amir 1996). Unlike other research (Barth 1994), that suggests that fair value securities gains and losses are less relevant and reliable than other earningcomponents, the results of fair value gains and losses in this paper show that the combined relevance and representational faithfulness to investors of unrealized gains and losses is robust. Through further analysis we attempt to shed light on *why* fair values provide more faithful and relevant numbers given the institutional characteristics of US publicly-traded VC firms.Taken together our results not only show that fair value numbers provide more value relevant information, but more reliable information as well. We have, therefore, brought grounds to support the use of fair value in financial statement reporting *even* when the underlying investments are not traded in active markets.

In this study, we have joined the many who have tested FVA vs. HCA (Ahmed and Takeda 1995, Barth 1994, Barth et al. 1996, Nelson 1996, Vehkatachalam 1996, etc.) proposing that in the venture capital industry, investment fair values are not only more relevant than historical cost figures, but are also more reliable. This, even in an industry where there is both ample "will" and "way" to manage the numbers. We have found that within the context of our study, *relevance* need not come at the expense of *representational faithfulness,* and vice versa. By performing standard tests using a unique database and yielding singular results, we contribute to the voluminous research on value-relevance, and to the fertile, yet largely untilled area of study on the venture capital industry.

We organize our paper as follows: In Section II we motivate our research questions with the institutional features of Fair Value Accounting for public venture capitalists and the prior research literature. In Section III we describe our sample and the data used in this study. In Section IV we discuss methodology and research design. In Section V we report our results. Section VI concludes the paper.

## II. INSTITUTIONAL SETTING AND RELATED LITERATURE

### The Venture Capital Industry

Venture capitalists raise funds in order to invest in young, promising companies. Through a combination of due diligence, intensive monitoring and direct assistance, the venture capitalist seeks to create companies that will eventually go public. A Venture Capital firm may be organized in several ways: it may be a publicly traded VC; a captive subsidiary of a large bank or corporation; a small business investment company or a private limited partnership (Barry 1994). The most common, and, therefore, the most focused upon in the relevant literature has been the limited partnership.

In a limited partnership VC, the venture capitalists (between two and ten) are the general partners who initiate and control the activities of a number of funds. Investors, generally institutional investors, are considered limited partners and may monitor the progress of the fund they are invested in, but are not involved in the day to day activities of the fund. A partnership agreement is signed at the fund's inception which clearly defines the compensation over the fund's life. Typically, general partners earn a percent of the funds' capital or assets as an annual management fee plus a percent of the profits to be paid out as investment returns are realized. This mechanism is set so as to align the incentives of the general and limited partners, and compensation terms are rarely re-negotiated.

The venture partnerships have predetermined, finite lifetimes of approximately ten years, after which the partnership is dissolved and the original capital plus any contractual returns on the investments are returned to the limited partners. The remainder is retained by the general partners who continue to monitor their present investments, and form another partnership in order to begin the cycle anew. Funds are raised by forming partnerships every two to five years. The typical fund makes twelve to twenty four investments over its life span (Gompers 1999). The VC generally follows a three-stage lifecycle[3]. First, it pre-screens business plans in order to select promising candidates. VC's will often peruse hundreds of plans before settling on a few companies to champion (Gompers 1994). Companies most likely to benefit from the capital and services of a VC are those with few tangible assets to pledge as collateral, and where information asymmetries are highest, such as high-tech and biotechnology companies. In such cases, VC expertise in guiding the company and in presenting it to the public is most needed. Second, the VC nurtures and monitors the investment, both with staged capital infusions, and managerial assistance. During this time VCs continue to periodically gather information and maintain the option to discontinue funding projects which display little probability to go public (Gompers 1995). Finally, the VC harvests its investment. The VC aims to exit its investment by taking the company public through a successful IPO, but it often is forced to exit either by merger or acquisition, a sale, or, commonly (about sixty percent of the time), a liquidation. It is in this last stage of harvesting that the differences between VC-backed companies and non-VC-backed companies becomes most apparent. In almost every industry in the U.S., the venture-backed IPO's reached the public market sooner and more profitably than the non-venture-backed group (Lerner and Watson 2007). Well-known VC successes include Microsoft, Intel, Staples and Starbucks amongst many others.

In short, to be successful, venture capitalists must excel at a myriad of activities. They must know when, how, and from whom to raise funds. In selecting companies to invest in, they must be able to discern the "apples" from the "lemons." Once chosen, they must properly time infusions of capital to the fledgling firms, and nurture, guide and monitor the firm. Finally, they must be able to discern when the time is ripe to take the firm "to market" (Barry 1994). If achieved, and the IPO is a profitable one, the VC firm will be able to pay out higher profits than those in the open market (Gompers 2008). Once a good reputation is gained, the task of fund-raising becomes much easier, as investors with capital seek out successful venture capitalists to invest with, hoping to reap high rewards when a firm goes public (Gompers and Lerner 2002, 242).

**Publicly Traded Venture Capital Firms**

Though academic researchers have rarely examined publicly traded venture capital firms, it is evident from the little written on the subject that these firms are of similar size and structure to their much more popular limited partnership counterparts (Brophy 1988, Gompers 1994, Cumming and Johan 2008). The lack of attention to publicly traded VC's is not due to lack of relevance, nor to lack of interest, but rather to a glaring lack of data. This is because there are very few (approximately fifteen) VC's that choose to incorporate, and those that are incorporated do not have most of their financial data listed on public databases such as CRSP or Compustat. Given the similarity between publicly traded VC's and privately held VC's, examining the public VC industry is useful not only in its own right but also in shedding light on the somewhat veiled limited partnership VC industry. Additionally, much can be learned by the comparisons that can be drawn between the public VC industry and other industries which have a large percentage of their net assets in securities.

**Why go Public?**

In the United States[4] there are major deterrents and very few incentives for a venture capital firm to go public. This is evident from the vast difference in number between private and public VC's: private VC's number in the thousands, while there are scarcely fifteen publicly traded venture capital firms. Under the Investment Company Act of 1940, public VC firms were restricted from transactions with their portfolio companies and investors. This changed in 1980, when the Small Business Investment Act allowed public VC firms to incorporate as Business Development Companies (BDC) that could invest in much the same manner as limited partnership VC's. However, Public VC's are subject to high costs – either by paying double taxation on corporate profits, or by trying to avoid it. Opting out of the double taxation can be done in one of two ways: one option is to register as a BDC with the SEC. However,registration is very expensive and must be renewed annually (Huemer 1992). A second alternative is to incorporate as a public partnership. This limits the firm, since there is no organized market to trade their shares, and money invested is, therefore, highly illiquid. Additionally, high broker and underwriterfees must be paid. Of course, like any public corporation, public VC's also must absorb costs of complying with financial statement regulations. Due to these factors, VC's in the United States are extremely hesitant to "go public," and, since there are many institutions with sizeable funds available for VC investing, they generally do not need to. Some firms, however, prefer (or need) to obtain capital from individual investors rather than large institutions and, therefore, incorporate. Incorporating provides two important benefits, amongst others. First, investors can avoid the capital gains tax, since profits can be re-invested as retained earnings. Second, individuals, rather than institutions are the primary investors, and they may not be as myopic as some institutions, such as pension funds. Gompers (1994) brings evidence from the private VC arena, that once ERISA permitted pension funds to invest in VC's, VC profitability decreased substantially due to pressures from pension funds to take their investments to market too early. A public VC fund provides executives with the flexibility to hold on to their best performing portfolio companies as long as it takes to yield their optimal return. Additionally, it can avoid abandoning companies that require more time to reach their profit-generating potential.

**Accounting Treatment of Publicly Traded VC's**

Publicly Traded VC's financial statements are governed by Section 2(a)(41) of the Investment Company Act of 1940 which stipulates that:

> *The value of securities for which market quotations are readily available should be the market value of such securities, and for other securities and assets, the value should be determined in good faith by management.*

In addition, the SEC issued Accounting Series Release (ASR) No. 118, Accounting for Exchange and Non-Exchange-Traded Securities and Fair Value Procedures (SEC, 1970), to further tighten the controls over the valuation of portfolio securities[5]. ASR No. 118 requires that investments in portfolio securities be carried at fair value with the net change in fair values (i.e., unrealized gains and losses) included in the determination of net income. The previously used historical cost remains the valuation choice when approximating the fair value of investments until significant developments affecting an investment provide a basis for valuation other than cost. In cases where no market exists for an asset, yet management has determined that the historical cost figure is no longer an accurate one, ASR 118 requires that management, or management-hired independent experts, arrive at an approximate valuation of the asset based on a variety of factors[6]. Investments in companies whose securities are publicly traded are valued at their quoted market price, less a discount to reflect the estimated effect of restrictions

on the sale of such securities, if applicable. Short-term investments having maturities of 60 days or less are stated at amortized cost, which approximates fair value. Other fixed income securities are stated at fair value, which is determined at the most recent bid or yield equivalent from dealers in such securities.

**Fair Value Accounting[7] and Venture Capital Firms**

Since the Public Venture Capital industry is subject to the above rules, it is ideal for conducting tests of fair value versus historical cost, to see whether fair value is indeed the better used accounting method. Previous studies have posed this important question, and attempted to answer it by exploring a variety of institutional settings such as that of investment securities, pension obligations, bank loans, closed-end mutual funds, derivatives, fixed assets and intangible assets. Value-Relevance is often determined by gauging whether fair value estimates are more largely reflected in share prices when compared with historical cost numbers (Barth 1994). With few exceptions, the general conclusion has been that fair values do provide incremental explanatory power for share prices and thus are deemed value-relevant to investors (Barth 1991, Barth 1994, Ahmed and Takeda, 1995, Venkatachalam 1996, Barth et al. 1996, Carroll et al. 1997, Barth et al. 1998, Aboody et al. 1999, Kallapur and Kwan 2004, Landsman and Shakespeare 2004, Hodder et al. 2006)[8].

Our study of *relevance* most closely relates to the work of Barth (1994) in which she examines banks investment securities and their related earnings components. Like banks, a large portion of a VC's assets are financial assets, and fair values of the securities and their related earnings components (i.e. realized and unrealized gains and losses) must be reported. Barth tests and finds that fair value estimates of securities provide significant explanatory power beyond that provided by historical cost. However, for securities gains and losses she finds the opposite to be true.

To the best of our knowledge, our study of *representational faithfulness* is unique, applying testing used in the past for analyst forecasts to the public VC framework.

## III. EMPIRICAL RELATIONS

**Evaluating Relevance**

In order to evaluate the relevance of fair value measures compared with historical cost measures, we follow Barth (1994) and employ a valuation model and an earnings capitalization model. Our valuation model seeks to uncover whether fair value estimates of VC investment securities provide incremental explanatory power beyond historical cost numbers when market value of equity is regressed on these variables. Our earnings capitalization model investigates whether the securities' related earnings components (realized and unrealized gains and losses) provide incremental explanatory power beyond earnings when market returns are regressed upon them. If a significant incremental effect is yielded in either regression, value relevance will have been established.

**Public Venture Capital Portfolio Securities**

To determine whether manager-determined fair value estimates provide explanatory power incremental to historical costs, we include both independent variables when regressing on share value (market value of equity). Results indicating a fair value coefficient significantly different from zero would signify that fair value estimates are indeed important in explaining share value.

The following cross-sectional estimation assumes that the market value-historical cost-fair value relationship is constant across firms, which is reasonably likely for publicly traded venture capital firms. This is so because such firms are largely homogeneous with respect to their investments and the nature of their operations. There are, however, some potentially relevant differences among publicly traded VCs and these include fair value estimation skills and tax status. Whether these differences violate the homogeneity assumption is explored below.

The estimation equations are:

$$MV_{it} = \alpha_{0t} + \alpha_{1t} BV_{Bit} + \alpha_{2t} COST_{it} + \alpha_{3t} FV_{it} + u_i \quad (1)$$

$$MV_{it} = \alpha\ 0t + \alpha\ 1t\ BV_{Bit} + \alpha\ 2t\ FV_{it} + u\ it \quad (2)$$

where *i* and *t* denote firms and quarters; *MV* represents the market value of common equity; *BVB* represents the book value of the firm's assets before investments; *COST* represents the firm's investments at historical cost prices; and *FV* represents the estimated fair value of the firm's investments. Disturbance terms are represented by *u* and *u'*. To mitigate effects of heteroscedasticity, all variables are deflated by the number of common shares outstanding (adjusted for stock dividends and splits).

It is important to note that investment fair values are equivalent to historical cost values plus their related unrealized appreciation or depreciation values (*DFV*), thus, equation (1) can also be represented as:

(1a) $MV_{it} = \alpha_{0t} + \alpha_{1t} BV_{Bit} + \gamma_{2t} COST_{it} + \alpha_{3t} DFV_{it} + u_{it}$ where $\gamma_{2t} = \alpha_{2t} + \alpha_{3t}$ of (1) above

In this price regression, significantly positive estimates suggest value relevance. Differences in coefficients may be observed, however, due to differences in estimation error or value relevance between the components.

**Public Venture Capital Portfolio Securities Gains and Losses**

After we evaluate the value relevance of public venture capital investment securities, we turn our attention to the investments' related earning components. We begin by dividing each firm's reported earnings into earnings before investment gains and losses (*EBGL*), realized gains and losses (*RGL*), and changes in unrealized gains and losses (*UGL*)[9] We then regress market returns on changes in earnings, realized gains and losses, and changes in unrealized gains and losses. Again, we wish to see whether fair values of VC's investment securities gains and losses provide incremental explanatory power above changes in earnings when regressed on market returns. If coefficients significantly different from zero on *RGL* and *UGL* are yielded, value relevance is once again established.

The estimation equations are:

$$R_{it} = \beta_{0t} + \beta_{1t} \Delta E_{Bit} + \beta_{2t} RGL_{it} + \beta_{3t} UGL_{it} + u_{it} \quad (3)$$

where *i* and *t* denote firms and quarters; *R* represents the quarterly market return on the stock; $\Delta E_B = E_{Bt} - E_{Bt-1}$ represents reported earnings (before investment gains and losses); *RGL* where $E_B$ represents realized investment gains and losses; and *UGL* represents unrealized investment gains and losses. The disturbance term is represented by *u.*

Since the dependent variable is market returns, all accounting variables are deflated by beginning-of- quarter price (Christie 1987). Differences in coefficients may once again be observed for the reasons listed above and because of differences among VCs in tax status. Additionally, income smoothing may be present in the form of management selectivity in realizing investment gains and losses.

In order to eliminate the need for specification of expected earnings and its components, Barth (1994) suggests that earnings, rather than changes in earnings, is the appropriate independent variable in equation (3). We follow this suggestion, and estimate the following changes (returns) regression:

$$R_{it} = \delta_{0t} + \delta_{1t} E_{Bit} + \delta_{2t} RGL_{it} + \delta_{3t} UGL_{it} + u_{it} \quad (4)$$

Next, in order to investigate whether the information of the fair values of investments is impounded correctly into firms' market values, we examine the relationship between the market value and the fair value of the public venture capital firm's investment portfolio. Before doing so, however, we use historical cost as a benchmark and

study its relationship with market value. Market values, historical cost and fair values are divided by book values of the VC's assets before investments.

$$\frac{MV_{it}}{BV_{Bit}} = \beta_{0t} + \beta_{1t}\frac{COST_{it}}{BV_{B}} + \mu_{it} \quad (5a)$$

$$\frac{MV_{it}}{BV_{Bit}} = \alpha_{0t} + \alpha_{1t}\frac{FV_{it}}{BV_{Bit}} + \mu_{it} \quad (5b)$$

Where $\mu_{it}$ represents white noise.

Finally, we estimate the following regression to test for the rationality of stock prices; again running the regression first with historical cost and then with fair values:

$$(MV_{it} - BV_{Bit}) = \beta_{0t} + \beta_{1t}(COST_{it} - BV_{Bit}) + \mu_{it} \quad (6a)$$

$$(MV_{it} - BV_{Bit}) = \alpha_{0t} + \alpha_{1t}(FV_{it} - BV_{Bit}) + \mu_{it} \quad (6b)$$

Assuming management-determined fair value of VC investment securities is the true value, under rational expectations, $\alpha_{1t} = 1$ and $\alpha_{k} = 1$.

**Evaluating Representational Faithfulness**

After completing our value relevance analysis of investment securities in the public venture capital industry, we turn our focus to the second part of our study and investigate whether fair values of investment securities are not only relevant, but are *representationally faithful* as well. We consider management-determined fair value estimates representationally faithful if they are found to accurately predict the actual value of the investment security. Actual values can only be known once the investment is disposed of, therefore, we study only fair values of securities for which an actual cash realized exit value is known. As opposed to the first part of our study in which we examined a firm's aggregated security investments, in this part of our study we look at the venture capital firm's disaggregated investment portfolio. Since we wish to discover whether management reported fair values are reflective of actual exit values, we compare reported fair values from four quarters prior to an exit with the actual value realized upon exit. We deem reported fair values "management forecasts" and employ tests similar to those used to evaluate the accuracy and bias in analysts' earnings forecasts (Fried and Givoly, 1985; O'Brien, 1988; Abarbanell, 1991). In order to isolate management forecast accuracy, we divide each disaggregated investment into debt and equity and look only at that portion of a firms' investment that is subject to estimation – equity.

We focus on the four main ways a firm may exit an investment, and value *EXIT*s in the following ways:

- When the investment is exited by a sale of equity in a portfolio company, the exit value is the realized cash from the sale;
- When the investment is exited due to a portfolio company "going public" (IPO), the exit value is equal to the price of the shares at the end of the first day of trading;
- When the investment is exited by a merger between the portfolio firm and another traded firm, the exit value is the realized cash from the merger;
- When the investment is written off, the exit value is equal to zero.

In cases where it is impossible to conclude the exact cash flow realized upon exit, we drop the observation from the sample.

In a vein similar to that in the *relevance* part of our study, we begin our testing of *reliability* by employing a simple univariate test to assess bias in and accuracy of fair value estimates. From these tests we are also able to determine whether management forecasts become more accurate as time to exit decreases. We estimate the following equation:

$$AAFE_0 = \frac{1}{N}\sum_i \frac{Abs(FV_{i,0} - \hat{FV}_{i,0-j})}{tCOST_i}, \quad j = 1,2,3,4 \text{ and}$$

$$AAFE_0 = \frac{1}{N}\sum_i \frac{Abs(FAIR_{i,0} - COST_i)}{COST_i},$$

where $AAFE_0$ denotes average absolute forecast error measured relative to the actual cash realized exit value determined at time 0; $FV_{i,0}$ denotes the actual cash realized exit value of investment *i* at time 0; $\hat{FV}_{i,0-j}$ denotes a fair value estimate made *j* quarters prior to exit; and $tCOST_i$ denotes the historical cost of investment *i*. The fair values estimated in the four quarters prior to an exit are denoted $FV_{i,t-1}$, $FV_{i,t-2}$, $FV_{i,t-3}$ and $FV_{i,t-4}$. We then perform the same test using the average square percentage error ($ASFE_0$) as the dependent variable, defined as:

$$ASFE_0 = \frac{1}{N}\sum_i \frac{(FV_{i,0} - \hat{FV}_{i,0-j})^2}{tCOST_i}, \quad j = 1,2,3,4 \text{ and}$$

$$ASFE_0 = \frac{1}{N}\sum_i \frac{(FAIR_{i,0} - \hat{COST}_i)^2}{COST_i},$$

All other variables are as defined above.

Next, we extend our analysis by moving from a univariate to a multivariate framework and examine whether our results from univariate testing continue to hold true in a multivariate setting. In this stage, we regress exit values on historical cost and on fair values estimates for four quarters prior to the exit. Significant positive coefficients on fair value variables would suggest that management-provided fair value estimates hold explanatory power incremental to historical cost values.

The following regression is estimated:

$$EXIT_{it} = \alpha_{0t} + \alpha_{1t} tCOST_i + \alpha_{2t} FV_{it-4} + \alpha_{3t} FV_{it-3} + \alpha_{4t} FV_{it-2} + \alpha_{5t} FV_{it-1} + \varepsilon_{it} \qquad (1)$$

where $FV_{it-j}$ denotes fair value estimates of investment *i*, made in quarter *t-j*, (*j* =1,2,3,4) and $EXIT_{it}$ denotes the exit value of the investment at time *t*. Since it is highly likely that fair value estimates are correlated, multi-collinearity may be present, which could result in estimates of $\alpha_1, \alpha_2, \alpha_3$ and $\alpha_4$ are statistically indistinguishable from zero.

In order to mitigate the effects of potential multi-collinearity between fair value estimates, we re-run the above regression in two different ways. First, we focus on fair value increments rather than on fair value estimates per quarter (Equation 2). Second, we follow a methodology proposed by Yaffee (2002). He recommends testing whether the effects of independent variables are significantly different from one another, and if not, simply adding the offending variables together. Upon finding that the effect of FVt-1 does not significantly differ from that of FVt-2, and that the effect of FVt-3 does not significantly differ from that of FVt-4, we combined the fair value

estimates of one and two quarters prior to the exit, and three and four quarters prior to the exit, and ran a regression using the combined quarters as independent variables (Equation 3).

$$EXIT_{it} = \beta_{0t} + \beta_{1t} tCOST_i + \beta_{2t} FV_{it-4} + \beta_{3t}(FV_{it-3} - FV_{it-4}) + \beta_{4t}(FV_{it-2} - FV_{it-3}) + \beta_{5t}(FV_{it-1} - FV_{it-2}) + \eta_{it} \quad (2)$$

$$EXIT_{it} = \beta_{0t} + \beta_{1t} tCOST_i + \beta_{2t}(FV_{it-3} + FV_{it-4}) + \beta_{3t}(FV_{it-1} + FV_{it-2}) + \eta_{it} \quad (3)$$

In a simplified scenario, where fair value measures equaled the values implicit in exit prices, and in the absence of correlated omitted variables, the sum of the coefficients on the independent variables in Equation (2) would be equal to one. Neither condition is likely to hold with actual accounting data, but the simplified setting provides a benchmark for assessing the characteristics of fair value measures.

## IV. DATA COLLECTION AND SAMPLE

We employ a sample of approximately two hundred and fifty equity investments made by US publicly traded venture capital firms for the years 1995 to 2008. The list was composed using Hoover's database, The Wall Street Journal Online and by conducting searches on internet search engines using the definition of small business development companies under the Investment Company Act of 1940. Quarterly and annual reports were drawn from Thompson Research. Accounting data, including fair values of investments, historical costs of investments, net assets (at fair value and at historical cost), realized gains or losses on investments and changes in unrealized gains or losses on investments were hand collected from the firms' financial statements. Stock prices and stock returns were taken from CRSP. Daily announcement information of the publicly traded VC investments was gathered from financial newspapers and magazines such as The Wall Street Journal Online, Dow Jones Interactive, and Lexis Nexis. We then cross-checked the data against the public reports of the VC fund in order to include only reports that provided new information.

### Evaluating Relevance

Table 1 provides descriptive statistics of firms being studied and their respective financial statement data for our *relevance* testing. In these tests we compare values of the aggregated portfolio investment of each public VC firm as opposed to our second set of tests in which we compare values of disaggregated equity investments. Looking at the market value of the firm, one observes that fair values are closer to market values than historical cost values are, on the whole. Recall that BV represents the book value of equity minus investment securities. Since investment securities make up the vast majority of a venture capital firm's assets, the mean of BV is very low, compared to the other measures.

The mean of the returns variable is close to zero with a very low standard deviation. Unrealized security gains and losses are far higher than realized security gains and losses, with a much greaterstandard deviation. This is intuitive, since unrealized security gains and losses are subject to management estimation, whereas realized security gains and losses are not.

**TABLE 1**
**DESCRIPTIVE STATISTICS FOR SAMPLE FIRMS: 1995-2008**

(in millions of dollars)

The sample includes fourteen publicly traded Venture Capital firms in the United States for the years 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Accounting data, including fair value, historical cost of investments, net assets (at fair value and historical cost), realized gains or losses on investment s and change in unrealized gains or losses on investments were collected

from annual and quarterly statements. *MV* represents market value of equity; *FV* represents the fair value of the portfolio of equity investments of the public VC firm. *BV* represents book value; *Cost* represents the historical cost value of the portfolio of equity investments.

*R* represents the quarterly market return of a firms stocks
$\Delta E_B$ Represents the quarterly change in earnings
*E* represents the earnings of a firm before investment gains and losses
*RGL* and *UGL* represent changes in realized and unrealized gains and losses, respectively

*Descriptive Statistics of Balance Sheet Data: All Firms*

| Variable | Observations | Mean | Standard Deviation |
|---|---|---|---|
| *MV* | 545 | 265.27 | 150.74 |
| *FV* | 544 | 236.23 | 137.99 |
| *BV* | 531 | 11.80 | 166.30 |
| *Cost* | 543 | 226.66 | 131.57 |

*Descriptive Statistics of Investment Gains and Losses Data: All Firms*

| Variable | Observations | Mean | Standard Deviation |
|---|---|---|---|
| *R* | 546 | 0.04 | 0.27 |
| $\Delta E_B$ | 545 | 1.12 | 109.84 |
| $E_B$ | 531 | -22.85 | 115.30 |
| *RGL* | 537 | 143.01 | 82.80 |
| *UGL* | 534 | 199.80 | 118.34 |

**Evaluating Representational Faithfulness**

The next set of tables examines disaggregated venture capital portfolio investments and their related exits in order to test for the *representational faithfulness* of fair value estimates.

Table 2 displays distributions of investment exits and aims to shed light on the type of equity investment a venture capital firm would exit from.We examine how the firm exited its investment, when the most exits occurred, which industries the firm exited from, and the level of ownership and control possessed by the VC firm prior to exiting. In Panel A, one can see that the majority of exits occurred by sale or merger (145) whereas approximately 40% of investments were written off. The number of IPO exits in our sample is negligible, probably due to our testing time frame. Additionally, approximately half of our sample did not provide information regarding form of exit, and several IPO exits may not be included in this distribution table. As one would expect, in the late 1990's when venture capital firms were extremely successful, exits by sales and/or mergers far outweighed exits by write-offs. Such was not the case in the more economically depressed years after the "bust" in December of 2000, however sales/mergers predominated once again towards the end of our sample years. Panel B presents a time frame as to when most exits occurred.

Panel C presents a breakdown of exits by industry. One can easily see that most exits occur in the service industry, which is not surprising given its high level of risk. Furthermore, it may be easier to exit from an investment in the service industry given the low amount of tangible assets invested. Many exits took place in the manufacturing industry, and, as expected, many exits took place in the technology industry as well. Panel D presents firm exits by previous level of VC ownership. We segregated our sample based on the percent of shares owned by the VC firm. We then examined the exits to see whether venture capitalists were more or less likely to exit firms they were more greatly invested in and vice versa. Though we assumed we would find that a greater number of exits took place when the venture capital firm was less invested in the investee firm it was exiting from,

both in terms of ownership and control, we did not find any great difference in number of exits for the different ownership levels.

**TABLE 2**
**Distribution of Equity Investment Exits**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms.

**Panel A**: *Distribution of Investment Exits by Type of Exit, by Year*[10]

| Exit Year | Number of Exits by Type | | |
|---|---|---|---|
| | Sale/Merger | IPO | Write-Off |
| 1996 | 1 | 0 | 2 |
| 1997 | 1 | 0 | 0 |
| 1998 | 10 | 0 | 3 |
| 1999 | 5 | 0 | 3 |
| 2000 | 3 | 0 | 2 |
| 2001 | 6 | 1 | 3 |
| 2002 | 11 | 0 | 13 |
| 2003 | 8 | 0 | 10 |
| 2004 | 16 | 0 | 19 |
| 2005 | 28 | 0 | 11 |
| 2006 | 24 | 0 | 14 |
| 2007 | 20 | 1 | 7 |
| 2008 | 12 | 0 | 8 |
| Total | 145 | 2 | 95 |

**Panel B:** *Distribution of Investment Exits by Year*

| Exit Year | Number of Exits | Percent of Exits |
|---|---|---|
| 1996 | 3 | 1.2 |
| 1997 | 3 | 1.2 |
| 1998 | 14 | 5.6 |
| 1999 | 8 | 3.2 |
| 2000 | 6 | 2.4 |
| 2001 | 10 | 4 |
| 2002 | 24 | 9.6 |
| 2003 | 18 | 7.2 |
| 2004 | 35 | 14.1 |
| 2005 | 39 | 15.7 |
| 2006 | 38 | 15.3 |

| | | |
|---|---|---|
| 2007 | 29 | 11.7 |
| 2008 | 22 | 8.8 |
| Total | 249 | 100% |

**Panel C:** *Distribution of Investment Exits by Industry*[11]

| Industry Number | Industry Name | Number of Exits | Percent of Exits |
|---|---|---|---|
| 1 | Non-Durables | 6 | 2.8 |
| 2 | Durables | 15 | 6.9 |
| 3 | Manufacturing | 32 | 14.8 |
| 4 | Energy | 5 | 2.3 |
| 5 | Chemicals | 2 | 0.9 |
| 6 | Business Equip. | 8 | 3.7 |
| 7 | Telephone and TV | 21 | 9.7 |
| 8 | Utilities | 5 | 2.3 |
| 9 | Shops | 8 | 3.7 |
| 10 | Healthcare | 10 | 4.6 |
| 11 | Finance | 14 | 6.5 |
| 12 | Technology | 25 | 11.6 |
| 13 | Service | 48 | 22.2 |
| 14 | Other | 17 | 7.9 |
| | Total | 216 | 100% |

**Panel D:** *Distribution of Investment Exits by Prior Level of Ownership*[12]

| Level of Ownership | Number of Exits by Type | | | |
|---|---|---|---|---|
| | Sale/Merger | IPO | Write-Off | Total |
| >25% Owned | 36 | 0 | 25 | 61 |
| 5%--25% Owned | 26 | 0 | 24 | 50 |
| <5% Owned | 38 | 2 | 29 | 69 |
| Total | 100 | 2 | 78 | 180 |

In Table 3 we present descriptive statistics for the individual portfolio investments. We divide the total sample of investments with identifiable outcomes for the period 1995-2008 into two groups according to their exit values: those with cash realized exit values above zero (sales/mergers/IPO) and those with cash realized exit values equal to zero (write-offs). We present the cost of each equity investment along with the fair value estimates for four quarters prior to the exit.When comparing the two exit groups one can clearly see from the mean values reported that management fair value estimates do approach exit values as the time of exit draws near. In cases of exit by sale, merger or IPO, the means of fair value estimates increase as each quarter passes. Interestingly, the means of fair value estimates do not exceed actual exit value, indicating conservatism on the part of the managers. The standard deviation, however, increases drastically as time of exit draws near, alluding to a certain level of confusion and uncertainty regarding how profitable the forthcoming sale or merger will be. In cases of exit by write-off, we find that managers are able to foresee that an investment has turned sour, and take the proper measures of impairing the said investment. As time of exit draws near, the fair values consistently decrease. Additionally, contrary to the case of positive cash flow exits, standard deviations steadily decrease as the date of exit approaches. Apparently, once a firm chooses to write- off an investment, it is abundantly clear that the investment will not suddenly become profitable. Notice that the distribution of cost, fair values and exit values are skewed to the right, suggesting that while many investments are unsuccessful, VC funds generate their returns from a relatively small number of successful investments.

**TABLE 3**
**DISAGGREGATE EQUITY INVESTMENTS SUMMARY STATISTICS**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped.
*tcost* represents the historical cost of the investment; *texit* represents the cash realized for the investment upon exiting the investment; *fvt1* represents the fair value of the investment one quarter prior to exit; *fvt2, fvt3* and *fvt4* represent the fair value of the investment two, three and four quarters prior to exit.
The data is divided into two sub-samples: investments with exit prices of zero (exit by writing-off the investment) and investments whose exit prices are above zero (exit by sale, merger or IPO).

**Summary Statistics (in thousands of dollars): Joint**

| Variable | Observations | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|---|
| *tcost* | 255 | 5884.14 | 19466.94 | 0.4 | 287300 |
| *texit* | 246 | 12727.64 | 42279.22 | 0 | 360468 |
| *fvt1* | 246 | 12210.4 | 42748.55 | 0 | 476578 |
| *fvt2* | 248 | 10435.96 | 34799.76 | 0 | 339400 |
| *fvt3* | 240 | 10119 | 32792.83 | 0 | 333900 |
| *fvt4* | 238 | 8102.1 | 21913.95 | 0 | 167044 |

**Summary Statistics: Exit Value Above Zero**

| Variable | Observations | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|---|
| *tcost* | 144 | 7872.94 | 25469.48 | 0.4 | 287300 |
| *texit* | 138 | 21192.77 | 55449.22 | 0 | 476578 |
| *fvt1* | 141 | 17660.22 | 44819.65 | 0 | 339400 |
| *fvt2* | 138 | 16737.17 | 41977.56 | 0 | 333900 |
| *fvt3* | 135 | 13087.98 | 27845.73 | 0 | 167044 |
| *fvt4* | 126 | 11850.95 | 22336.31 | 0 | 138488 |

**Summary Statistics: Exit Value Equal to Zero**

| Variable | Observations | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|---|
| *tcost* | 95 | 3243.52 | 4554.76 | 1 | 24944 |
| *texit* | 95 | 0 | 0 | 0 | 0 |
| *fvt1* | 95 | 118.86 | 534.42 | 0 | 3464 |
| *fvt2* | 94 | 421.95 | 1989.78 | 0 | 17390 |
| *fvt3* | 92 | 642.75 | 2810.11 | 0 | 25444 |
| *fvt4* | 92 | 984.92 | 3728.37 | 0 | 33459 |

## V. RESULTS

After describing the firms in our sample and the magnitude and makeup of their aggregated and disaggregated investment portfolios, we turn to our regression equations. We may now observe whether our hypothesis that management-provided fair value estimates are both *relevant* and *representationally faithful* for financial statement users holds true.

### Evaluating Relevance

Table 4 consists of three panels, each attempting to see whether fair value estimates provide incremental explanatory power beyond historical cost when regressed on market value of equity. We perform our tests employing a fixed effects regression model. Fixed effects models permit pooling observations in order to increase power while mitigating cross-sectional and serial correlation that could bias reported test statistics. It assumes that the regression residuals comprise quarter-specific, firm-specific and random components. Since our data consists of the same firms examined over the same years, the fixed effects model is the model which produces the least biased coefficients and best controls heteroskedasticity inherent in the data. In fact, when employing a fixed effects model, results are positive and highly significant as opposed to results from the independent and White regressions. Results from the fixed effects model are presented in Table 4.

The findings in Table 4 indicate that fair value estimates do indeed provide incremental explanatory power above historical cost. In Panel A, the fixed effects regression yields a positive and highly significant coefficient on the fair value variable. This indicates that fair values of public VC investment securities provide relevant information for investors. Furthermore, VC share prices act as though fair value estimates contain more information than their historical cost counterparts. The coefficient on *COST*, however, is negative, probably because it is subsumed in the fair value variable. This can be confirmed by noticing that the coefficient on *COST* in Panel B is positive, when only the difference between fair value and cost is included rather than the aggregated fair value figure.

In Panel B, when historical cost values are not included in the regression equation, the coefficient on FV is positive and significant at the one percent level. In Panel C, rather than include raw fair value estimates, we regress market value of equity on book value, cost of investment securities and on the difference between fair value estimates and cost (*DFVC*). In this way we eliminate the possibility of double counting for historical cost values. In our fixed effects model, the coefficient on *DFVC* is highly significant, and the absolute value of the coefficient on *DFVC* is greater than that on *Cost*, testifying to its greater informational content to investors as reflected by market value of equity. Recall that the coefficient on *Cost* in this regression (1a) should be approximately equal to the sum of the coefficients on *Cost* and *FV* in (1). As one can see this is indeed the case, as the coefficient on *Cost* in Panel C is equal to 0.292, very close to the sum of the coefficients in Panel A: 0.339.

**TABLE 4**
**TESTING THE INCREMENTAL EFFECT OF FAIR VALUE ABOVE HISTORICAL COST (N=545)**

The sample includes fourteen publicly traded Venture Capital firms in the United States for the years 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Accounting data, including fair value, historical cost of investments, net assets (at fair value and historical cost), realized gains or losses on investments and change in unrealized gains or losses on investments were collected from annual and quarterly statements.

*MV* represents market value of equity; *FV* represents the fair value of the portfolio of equity investments of the public VC firm. *BV* represents book value. *Cost* represents the historical cost of the portfolio of equity investments. *dFVC* represents the cumulative difference between *FV* and *Cost*. The disturbance term is represented by u. Fixed Effects models are employed, appropriate for the panel data used in tests here.

*t*- statistics are in parentheses.

***, **, * denote statistical significance at 1%, 5% and 10%

**Panel A**: (1) $MV_{it} = \alpha_{0t} + \alpha_{1t} BV_{Bit} + \alpha_{2t} COST_{it} + \alpha_{3t} FV_{it} + u_{it}$

| | $a_{0t}$ | $a_{1t}$ | $a_{2t}$ | $\alpha_{3t}$ | $R^2$ |
|---|---|---|---|---|---|
| Fixed Effects | 4.948*** | 0.157*** | -0.413*** | 0.752*** | 0.92 |
| | (10.04) | (6.80) | (-10.48) | (26.04) | |

**Panel B:** (2) $MV_{it} = \alpha_{0t} + \alpha_{1t} BV_{Bit} + \alpha_{2t} FV_{it} + u_{it}$

| | $a_{0t}$ | $a_{1t}$ | $a_{2t}$ | $R^2$ |
|---|---|---|---|---|
| Fixed Effects | 1.478*** | 0.256*** | 0.567*** | 0.93 |
| | (3.68) | (11.07) | (22.59) | |

**Panel C:** (1a) $MV_{it} = \alpha_{0t} + \alpha_{1t} BV_{Bit} + \gamma_{2t} Cost_{it} + \alpha_{3t} dFVC_{it} + u_{it}$

| | $a_{0t}$ | $a_{1t}$ | $a_{2t}$ | $\alpha_{3t}$ | $R^2$ |
|---|---|---|---|---|---|
| Fixed Effects | 4.603*** | 0.190*** | 0.292*** | 0.711** | 0.92 |
| | (8.77) | (7.84) | (8.77) | (23.09) | |

Table 5 presents regression summary statistics for equations (3) and (4), using first changes in earnings and then earnings as explanatory variables. Pooled and fixed effects estimations are presented. The coefficient on $\Delta E_B$ in both panels is positive but insignificant. The coefficient on realized gains and losses (*RGL*), $\beta_2$, is also significant, but negative in both panels, perhaps because the realized information is already known to investors and embodied in unrealized gains and losses (*UGL*). Barth et al. (1990) also find significant negative coefficients on realized gains and losses and attribute it to income smoothing by management. The results for $\beta_3$ show that the coefficient of the unrealized gains and losses is significantly positive in both columns, evidence that values of unrealized gains and losses provide explanatory power to investors. These results are consistent with the results reported in Table 4, and with the presumption of relevance of fair value estimators for investors.

**TABLE 5**
**THE INCREMENTAL EFFECT OF GAINS AND LOSSES ON RETURNS (N=545)**

The sample includes fourteen publicly traded Venture Capital firms in the United States for the years 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Accounting data, including fair value, historical cost of investments, net assets (at fair value and historical cost), realized gains or losses on investments and change in unrealized gains or losses on investments were collected from annual and quarterly statements. *R* represents the quarterly market return of a firms $\Delta E_B$ Represents the quarterly change in earnings; *E* stock. represents the earnings of a firm before investment gains and losses; *RGL* and *UGL* represent changes in realized and unrealized gains and losses, respectively. The disturbance term is represented by u.
Pooled GLS and Fixed Effects models are employed, both appropriate for the panel data used in tests here. z-statistics (GLS) or t- statistics are in parentheses.
***, ** and * denotes statistical significance at 1%, 5% and 10%, respectively.

**Panel A:** (3) $R_{it} = \beta_{0t} + \beta_{1t} + \beta_{2t} RGL_{it} + \beta_{3t} UGL_{it} + u_{it}$ $\Delta E_{Bit}$

| | $\beta_{0t}$ | $\beta_{1t}$ | $\beta_{2t}$ | $\beta_{3t}$ | |
|---|---|---|---|---|---|
| Corr. Coefficient | | | | | |
| Pooled GLS | 0.094 | 0.249 | -1.939* | 0.819* | $Chi^2(41) = 911.8$ |
| | (1.56) | (0.75) | (-1.77) | (2.56) | P=0.00 |
| Fixed Effects | 0.904*** | 0.263 | -2.504*** | 0.875*** | $R^2 = 0.37$ |
| | (3.41) | (1.62) | (-4.69) | (5.68) | |

**Panel B:**

(4) $R_{it} = \delta_{0t} + \delta_{1t} E_{Bit} + \delta_{2t} RGL_{it} + \delta_{3t} UGL_{it} + u_{it}$

| | $\delta_{0t}$ | $\delta_{1t}$ | $\delta_{2t}$ | $\delta_{3t}$ | |
|---|---|---|---|---|---|
| Corr. Coefficient | | | | | |
| Pooled GLS | 0.097 | -0.477 | -4.06*** | 0.375 | $Chi^2(41) = 973.8$ |
| | (1.60) | (-1.60) | (-2.63) | (1.56) | P=0.00 |
| Fixed Effects | 1.044*** | -0.278* | -3.79*** | 0.517*** | $R^2 = 0.37$ |
| | (3.91) | (-1.78) | (-5.08) | (4.26) | |

To further test the relevance of fair value estimates, we run regressions (5a), (5b), (6a) and (6b) presented in Table 6, Panels A and B, below. Table 6 Panel A first, as a benchmark test, estimates the relation between the market value of the venture capital firm's shares and the historical cost of their security investments. Next, in (5b) it estimates the relation between the market value of the VC firm's shares and the estimated fair values of their security investments. Variables are deflated by the book value of equity before investments. When regressing market value on historical cost, the coefficient on *COST* is not significant in either the pooled or White corrected regression. On the contrary, when regressing market value on fair value, the coefficient on *FV* is positive and highly significant in both regression forms.

Panel B presents results of regressing the difference between market value and book value of equity before investments first on the difference between historical cost and book value of equity before investments (6a), and then on the difference between fair value of the investments and book value of equity before investments (6b). When regressing market value on both *COST* and on *FV*, the slope coefficient is positive and highly significant. The above testing indicates that the hypothesis that current prices properly reflect management-determined estimates of future cash flows cannot be rejected. We mentioned above that under rational expectations, . We find in Panel A, when $\alpha_{1t} = 1$ and $\alpha'_t = 1$. running a pooled regression that $\alpha_{1t} = 0.91$, which is very close to 1. This lends support to the supposition that management estimates of fair value closely represent the true value of equity assets. In Panel B we do not find equally strong results, as $\alpha'_t = 0.53$, when running a pooled [1] regression.

**TABLE 6**
**TESTING RATIONAL EXPECTATIONS (N=541)**

The sample includes fourteen publicly traded Venture Capital firms in the United States for the years 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Accounting data, including fair value, historical cost of investments, net assets (at fair value and historical cost), realized gains or losses on investments and change in unrealized gains or losses on investments were collected from annual and quarterly statements.

*MV* represents market value of equity; *FV* represents the fair value of the portfolio of equity investments of the public VC firm. *BV* represents book value. *Cost* represents the historical cost of the portfolio of equity investments. The disturbance term is represented by u.

*z*-statistics (GLS) and *t*-statistics (Robust) are in parentheses.

"Robust" refers to White's test to correct for heteroskedasticity.

***, **, * denote statistical significance at 1%, 5% and 10% respectively.

**Panel A and B:**

(5a) $$\frac{MV_{it}}{BV_{Bit}} = \alpha_0 + \alpha 1_{it}\frac{COST_{it}}{BV_{Bit}} + \mu_{it}$$

| | $\alpha 0$ | $\alpha 1$ | Corr. Coefficient |
|---|---|---|---|
| Pooled GLS | 0.120*** | 0.000 | $Chi^2(27) = 4979$ |
| | (3.73) | (0.00) | P = 0.00 |
| Robust | 0.736*** | 0.000 | $R^2 = 0.77$ |
| | (10.51) | (-0.06) | |

(5b) $$\frac{MV_{it}}{BV_{Bit}} = \alpha_0 + \alpha 1_{it}\frac{FV_{it}}{BV_{Bit}} + \mu_{it}$$

| | $\alpha 0$ | $\alpha 1$ | Corr. Coefficient |
|---|---|---|---|
| Pooled GLS | 0.001 | 0.913*** | $Chi^2(27) = 408.580$ |
| | (0.16) | (27.12) | P = 0.00 |
| Robust | 0.149*** | 0.819*** | $R^2 = 0.97$ |
| | (4.14) | (21.55) | |

(6a) $$(MV_{it} - BV_{Bit}) = \alpha_{0t} + \alpha_{1t}(COST_{it} - BV_{Bit}) + \mu'_{it}$$

| | $\alpha_0$ | $\alpha_1$ | Corr. Coefficient |
|---|---|---|---|
| Pooled GLS | 0.010 | 0.018*** | $Chi^2(27) = 505,269$ |
| | (0.20) | (5.95) | P = 0.00 |
| Robust | 1.133*** | 0.017*** | $R^2 = 0.92$ |
| | (3.826) | (5.58) | |

(6b) $$(MV_{it} - BV_{Bit}) = \alpha_{0t} + \alpha_{1t}(FV_{it} - BV_{Bit}) + \mu'_{it}$$

| | $\alpha_0$ | $\alpha_1$ | Corr. Coefficient |
|---|---|---|---|
| Pooled GLS | 0.003 | 0.533*** | $Chi^2(27) = 654,108$ |
| | (0.11) | (9.67) | P = 0.00 |
| Robust | 0.697*** | 0.503*** | $R^2 = 0.96$ |
| | (3.85) | (8.29) | |

Once we have found that fair value estimates provided by managers of public venture capital firms are *relevant,* we attempt to see whether they are also *reliable.* We do so by comparing management-provided estimates of disaggregated equity investments for the four quarters prior to an exit of an investment, to the actual cash realized value of an investment upon exiting.

**Evaluating Representational Faithfulness**

Though from a cursory glance at the descriptive statistics presented in Table 3, one can see that fair value estimates appear to be reliable, we embark on a somewhat more rigorous analysis of fair value estimates' hypothesized *representational faithfulness*.

In Table 7, we examine the distribution of management forecast errors, where forecast errors are defined as the difference between actual cash realized exit values and the estimated exit values based on fair values and on cost, divided by the cost of the investment. We conduct *t*-tests on the mean forecast errors to see whether each variable is significantly different from zero. Mean forecast errors are positive for historical cost and all fair value estimates, aside from fair values estimated three quarters prior to the exit. However, none of these measures are significantly different than zero, as reflected by the *t*-tests. Median forecast errors, on the other hand, are negative for historical cost and are zero for all fair value estimates. Our finding different results when performing mean and median testing is reflective of the right-hand skewness in our exit distributions. As expected, historical cost measures are the most optimistic measures of future exit values, since many exit values are zero. More interesting is the pattern of optimism in fair value estimates. While median forecast errors remain zero and unchanged as the exit approaches, the standard deviation decreases from three quarters prior, suggesting that management forecasts become less biased as exit approaches. This pattern is consistent with similar tests on analysts' earnings forecasts where earnings forecasts become less optimistic as the announcement of actual earnings approaches.

**TABLE 7**
**COST AND FAIR VALUE ESTIMATES AS PREDICTORS OF EXIT VALUES**
**DISTRIBUTION OF FORECAST ERROR**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped. Forecast errors are computed as the difference between exit value and predictors of exit value, deflated by the investment's historical cost. The predictors are the investment's cost and fair values in the four quarters preceding the exit ($FV_{i,t-1}$, $FV_{i,t-2}$, $FV_{i,t-3}$ and $FV_{i,t-4}$).
Average forecast error is $AFE_0 = \frac{1}{N}\sum \frac{(FV_{i,0} - \hat{FV}_{i,0-j})}{tCOST}, j = 1,2,3,4$ and $AFE_0 = \frac{1}{N}\sum \frac{(FV_{i,0} - \hat{COST}_{i,0-j})}{tCOST}, j = 1,2,3,4$

where $AFE_0$ denotes average forecast error measured relative to the exit value at time 0. $FV_{i,0}$ denotes exit value of investment $i$ at time 0. $tCOST_i$ denotes the historical cost of investment $i$. $FV_{i,0-j}$ denotes a fair value estimate made $j$ quarters prior to exit.
***, ** and * denotes statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

| Predictor of Exit Value | Mean | Med | SD | Min | Max | Mean t-test |
|---|---|---|---|---|---|---|
| ***FVt1*** | 0.51 | 0 | 15.28 | -154.5 | 165.35 | 0.11 |
| ***FVt2*** | 5.87 | 0 | 71.91 | -158.95 | 1093.5 | -0.04 |
| ***FVt3*** | -3.5 | 0 | 88.69 | -1360 | 254.5 | 0.08 |
| ***FVt4*** | 6.61 | 0 | 60.84 | -51.6 | 920 | 0.03 |
| ***tCost*** | 23.54 | -0.71 | 276.7 | -1 | 4344 | 0.09 |

Next, in Table 8, we examine the accuracy of historical cost and fair value estimates in predicting the actual exit value. Management accuracy of fair value estimation is measured first by absolute forecast error (Panel A) and second, by squared forecast errors (Panel B), where forecast errors are the difference between actual and predicted exit values, deflated by historical cost. We report *t*-tests on the mean absolute (and squared) forecast errors. Tests using either measure of forecast accuracy yield similar results as displayed in panels A and B of Table 8.

It is apparent from Panel A that mean and median absolute forecast errors decrease from three quarters prior to the date of exit. For example, mean absolute forecast error decreases from 7.61 in the fourth quarter prior to exit to 2.47 in the quarter immediately prior to the exit. The standard deviation of the forecast errors also decreases as the date of exit approaches (from 60.84 four quarters prior to exit to 15.11 in the quarter immediately prior to the exit). We also compare the management absolute forecast error over the four quarters to the difference between the exit price and the cost, divided by the cost. We find that when using the historical cost of investments to estimate the exit price, the absolute forecast error is largest compared to fair value estimates in all four quarters prior to the exit. Furthermore, when using historical cost as an estimate for actual exit value, the standard deviation of the absolute forecast error, 277.14, is higher than the standard deviation of fair value estimates management absolute forecast error in all four quarters prior to the exit.

Panel B presents results of management forecast accuracy tests using squared forecast errors as the dependent variable. The mean squared forecast error decreases as time to exit decreases, as does the standard deviation. Like in panel A, historical cost is least accurate in predicting future exit values, and suffers from the highest standard deviation values.

Not surprisingly, the results in Table 8 suggest that fair value estimates made in the year prior to exit are better predictors of actual cash realized exit values than historical cost numbers are. While one would expect this result given the significant time lag between the initiation of the investment and the exit date, it is interesting to note the increased accuracy of fair value estimates as the exit approaches. Clearly, as the exit date approaches, management updates their predictions of future exit values based on additional information.

**TABLE 8**
**COST AND FAIR VALUE ESTIMATES AS PREDICTORS OF EXIT VALUES**
**DISTRIBUTION OF ABSOLUTE AND SQUARED FORECAST ERRORS**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped. Forecast errors are computed as the difference between exit value and predictors of exit value, deflated by the investment's historical cost. The predictors are the investment's cost and fair values in the four quarters preceding the exit ($FV_{i,t\text{-}1}$, $FV_{i,t\text{-}2}$, $FV_{i,t\text{-}3}$ and $FV_{i,t\text{-}4}$). Average Absolute Forecast Error is $AAFE_0 = \frac{1}{N}\sum_i \frac{Abs(FV_{i,0} - \hat{FV}_{i,0-j})}{tCOST_i},\ j = 1,2,3,4$ and $AAFE_0 = \frac{1}{N}\sum_i \frac{Abs(FV_{i,0} - \hat{COST}_{i,0-j})}{tCOST_i},\ j = 1,2,3,4$ where $AAFE_0$ is measured relative to the exit value at time 0. $FV_{i,0}$ denotes exit value of investment $i$ at time 0. $\hat{FV}_{i,0-j}$ denotes expected exit value based on fair value estimates ($FV_{i,t\text{-}1}$, $FV_{i,t\text{-}2}$, $FV_{i,t\text{-}3}$ and $FV_{i,t\text{-}4}$) made $j$ quarters prior to exit and the historical cost. Average Squared Forecast Error is

$ASFE_0 = \frac{1}{N}\sum_i \frac{(FV_{i,0} - \hat{FV}_{i,0-j})^2}{tCOST_i}, j = 1,2,3,4$ and $ASFE_0 = \frac{1}{N}\sum_i \frac{(FV_{i,0} - \hat{COST}_{i,0-j})^2}{tCOST_i}, j = 1,2,3,4$. All other variables are as defined above.

***, ** and * denotes statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

**Panel A:** *Distribution of Absolute Forecast Errors*

| Predictor of Exit Value | Mean | Med | SD | Min | Max | Mean t-test |
|---|---|---|---|---|---|---|
| ***FVt-1*** | 2.47 | 0.02 | 15.11 | 0 | 165.35 | 0.16 |
| ***FVt-2*** | 7.85 | 0.14 | 71.86 | 0 | 1093.5 | 0.11 |
| ***FVt-3*** | 9.48 | 0.21 | 88.43 | 0 | 1360 | 0.11 |
| ***FVt-4*** | 7.61 | 0.38 | 60.84 | 0 | 920 | 0.13 |
| ***tCost*** | 24.68 | 1 | 277.14 | 0 | 4344 | 0.09 |

**Panel B:** *Distribution of Squared Forecast Errors*

| Predictor of Exit Value | Mean | Med | SD | Min | Max | Mean t-test |
|---|---|---|---|---|---|---|
| ***FVt-1*** | 167376 | 1.02 | 2539648 | 0 | 40239124.60 | 0.07 |
| ***FVt-2*** | 192974 | 52.99 | 2590105 | 0 | 40807302.05 | 0.07 |
| ***FVt-3*** | 204566 | 171.12 | 2606336 | 0 | 40939619.36 | 0.08 |
| ***FVt-4*** | 209189 | 389.3 | 2676148 | 0 | 42274910.87 | 0.08 |
| ***tCost*** | 439297 | 2569 | 3812089 | 0 | 49531186.30 | 0.12 |

After performing testing in a univariate framework, we turn our attention to testing for representational faithfulness in a multivariate framework. Robust standard errors are used in order to resolve a heteroskedasticity problem. Table 9 presents the results of our first ordinary least squares regression. When regressing exit values on *all* fair value estimates for the four quarters prior to the exit in addition to historical cost (regression 6), fair value estimates two periods prior to exit seem to explain exit value the best. Fair value estimates in the quarter immediately prior, provide a close second. In fact, when running all quarters, only the coefficients on periods one and two prior to date of exit are significant.

When performing the regression on each of the prior four quarters *individually*, all coefficients are found to be statistically significant, yet the R-squared measures indicate that fair value estimates one and two periods prior to the exit date best explain exit values. Fair value estimates three quarters prior to the exit date are not as accurate, four quarters prior are worse yet, and historical cost measures fair worst by far. In addition, the coefficients become closer to one as the date of exit approaches, suggesting that fair value estimates become more accurate as the exit draws near.

**TABLE 9**
**THE ASSOCIATION BETWEEN HISTORICAL COST AND FAIR VALUE ESTIMATES AND FUTURE EXIT VALUES - REGRESSION ANALYSIS USING QUARTERLY DATA**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped. Number of observations varies according to data availability.

The Table presents results of OLS regressions where the exit price of the investment is the dependent variable. The model is:

$$EXIT_{it} = \alpha_{0t} + \alpha_{1t} tCOST_i + \alpha_{2t} FV_{it-1} + \alpha_{3t} FV_{it-2} + \alpha_{4t} FV_{it-3} + \alpha_{5t} FV_{it-4} + \varepsilon_{it}$$

Where *tcost* represents the historical cost of the investment; *EXIT* represents the cash realized for the investment upon exiting the investment; *fvt1* represents the fair value of the investment one quarter prior to exit; *fvt2, fvt3* and *fvt4* represent the fair value of the investment two, three and four quarters prior to exit.

***, ** and * denote statistical significance at 0.01, 0.05, and 0.10 levels, respectively.

| | **1** | **2** | **3** | **4** | **5** | **6** |
|---|---|---|---|---|---|---|
| ***Intercept*** | 4884 | 2094.15 | 1483.61 | 1503 | -310.84 | 1926.22 |
| | (2.51)*** | (1.78)* | (1.30) | (1.13) | (-0.25) | (-1.40) |
| | | | | | | |
| ***Cost*** | 1.33 | | | | | -0.31 |
| | (4.17)*** | | | | | (-1.42) |
| | | | | | | |
| $FV_{t-1}$ | | 0.93 | | | | 0.41 |
| | | (8.65)*** | | | | (5.62)*** |
| | | | | | | |
| $FV_{t-2}$ | | | 1.12 | | | 0.57 |
| | | | (9.85)*** | | | (4.80)*** |
| | | | | | | |
| $FV_{t-3}$ | | | | 1.19 | | 0.27 |
| | | | | (7.27)*** | | (0.74) |
| | | | | | | |
| $FV_{t-4}$ | | | | | 1.61 | -0.02 |
| | | | | | (7.56)*** | (-.1) |
| | | | | | | |
| $R^2$ | 0.38 | 0.82 | 0.82 | 0.78 | 0.73 | 0.82 |
| ***F-Statistic*** | 17.38*** | 74.84*** | 97.05*** | 52.88*** | 57.16*** | 538*** |
| ***N=*** | 251 | 250 | 245 | 240 | 238 | 233 |

Finally we test to see whether multicollinearity poses a significant issue in our regression equation and based on several factors determine that multicollinearity is indeed a concern. In order to mitigate the effects of multicollinearity we modify our basic ordinary least squares regression in two ways, presented in Tables 10 and 11 below.

Table 10 focuses on fair value increments rather than fair value estimates in order to overcome multicollinearity among fair value estimates. In this case we study whether additional information is provided in the fair value estimates of each sequential quarter. As one can see, additional information is provided as evidenced by the positive and significant coefficients of difference between the fair value estimates in the third to fourth, second to third and first to second quarters. Historical cost values provide no additional information. Once again, the results of these regressions show that managers' predictions of future exit values become more accurate as the exit date approaches. We control for heteroskedasticity by using robust standard errors.

**TABLE 10**
**THE ASSOCIATION BETWEEN HISTORICAL COST AND CHANGES IN FAIR VALUE ESTIMATES AND FUTURE EXIT VALUES - REGRESSION ANALYSIS USING QUARTERLY DATA**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped. Number of observations varies according to data availability.
The model is:

$$EXIT_{it} = \beta_{0t} + \beta_{1t} tCOST_{i} + \beta_{2t} FV_{it-4} + \beta_{3t}(FV_{it-3} - FV_{it-4}) + \beta_{4t}(FV_{it-2} - FV_{it-3}) + \beta_{5t}(FV_{it-1} - FV_{it-2}) + \eta_{it}$$

Where *tcost* represents the historical cost of the investment; *EXIT* represents the cash realized for the investment upon exiting the investment; *fvt1* represents the fair value of the investment one quarter prior to exit; *fvt2, fvt3* and *fvt4* represent the fair value of the investment two, three and four quarters prior to exit.
***, ** and * denote statistical significance at 0.01, 0.05, and 0.10 levels, respectively.

| | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| ***Intercept*** | 11212.29 | 11309.79 | 7972.13 | 1926.22 |
| | (3.76)*** | (4.16)*** | (4.91)*** | (1.4) |
| | | | | |
| ***tCost*** | | | | -0.31 |
| | | | | (-1.42) |
| | | | | |
| $FV_{t-1}$-$FV_{t-2}$ | 1.10 | | | 0.41 |
| | (1.67)* | | | (5.62)*** |
| | | | | |

| | | | | |
|---|---|---|---|---|
| $FV_{t-2}$-$FV_{t-3}$ | | 3.22 | | 0.98 |
| | | (1.74)* | | (8.26)*** |
| | | | | |
| $FV_{t-3}$-$FV_{t-4}$ | | | 5.19 | 1.24 |
| | | | (5.80)*** | (4.45)*** |
| | | | | |
| $FV_{t-4}$ | | | | 1.22 |
| | | | | (14.40)*** |
| | | | | |
| $R^2$ | 0.17 | 0.22 | 0.54 | 0.82 |
| *F-Statistic* | 2.79* | 3.03* | 33.60*** | 537.7*** |
| *N*= | 244 | 239 | 234 | 233 |

In Table 11 we attempt to control for multicollinearity following a methodology proposed by Yaffee (2002) as mentioned above. After combining fair value estimates for quarters one and two prior to exit, and for quarters three and four prior, we find that fair values are best estimated in the half year before the date of exit as opposed to a year and three quarters before. When we regress exit value on *all* independent variables, including historical cost (regression 3), we find the coefficient on the half year prior to be greater and more significant than that on a year and three quarters before the exit (.48 significant at the .01 level, compared to .14 significant at a level of .10).

When we regress exit value on each independent variable individually, coefficients in both cases are highly significant, however the R-squared value when regressing on the half year prior (equation 1) is greater than the R-squared value when regressing on three and four quarters prior to the exit. While Table 11 does not provide as fine a breakdown as the previous tables, one can once again see that management provided estimates of future exit value are indeed *representationally faithful* in that they approach true exit value as the time of exit draws near.

**TABLE 11**
**THE ASSOCIATION BETWEEN HISTORICAL COST AND COMBINED FAIR VALUE ESTIMATES AND FUTURE EXIT VALUES - REGRESSION ANALYSIS USING QUARTERLY DATA**

The sample contains 250 investments in start-up companies made by 14 publicly traded venture capital firms in the United States for the period 1995-2008. These publicly traded VC firms are identified through Hoover's database, and through search engines on the internet using the definition of small business development companies under the Investment Company Act of 1940. Their financial statement data are available from Thompson Research, the source of most data items. Investment and outcome announcements were obtained from 10Ks and 10Qs filed by the venture capital firms. Investment outcomes were matched with the investment announcements, and all announcements that could not be matched were dropped. Number of observations varies according to data availability.
The model is:

$$EXIT_{it} = \beta_{0t} + \beta_{1t} tCOST_{i} + \beta_{2t}(FV_{it-1} + FV_{it-2}) + \beta_{3t}(FV_{it-3} + FV_{it-4}) + \eta_{it}$$

Where *tcost* represents the historical cost of the investment; *texit* represents the cash realized for the investment upon exiting the investment; *fvt1* represents the fair value of the investment one quarter prior to exit; *fvt2, fvt3* and *fvt4* represent the fair value of the investment two, three and four quarters prior to exit.
***, ** and * denote statistical significance at 0.01, 0.05, and 0.10 levels, respectively.

| | **1** | **2** | **3** |
|---|---|---|---|
| ***Intercept*** | 1435.23 | -248.85 | 2001.12 |
| | (1.55) | (-.23) | -1.52 |
| | | | |
| ***tCost*** | | | -0.34 |
| | | | (-1.73)* |
| | | | |
| $FV_{t-1}$+$FV_{t-2}$ | 0.53 | | 0.48 |
| | (29.29)*** | | (8.97)*** |
| | | | |
| $FV_{t-3}$+$FV_{t-4}$ | | 0.76 | 0.14 |
| | | (9.96)*** | (1.83)* |
| | | | |
| $R^2$ | 0.85 | 0.75 | 0.82 |
| ***F-Statistic*** | 857.85*** | 99.19*** | 344.85*** |
| ***N=*** | 244 | 234 | 233 |

## VI. CONCLUSION

In this paper we attempted to study whether accounting standard ASR 118 mandating the reporting of fair values of investment securities would indeed be beneficial to investors. It had long been thought that historical cost was a more reliable measure of security investments, and therefore is the more relevant measure for financial statement users. Furthermore, when a strong motivation exists to inflate the portfolio values, we wished to see whether distortions would occur. We chose a unique setting, the United States public venture capital industry, and tested this premise to see whether the new accounting standard would actually be of import to investors, or whether historical cost measures already provided all relevant information.

We began by studying the *relevance* of manager-reported fair value estimates of public venture capital firms' aggregated investment portfolios. We found that fair value estimates do provide information incremental to historical cost values as evidenced by its effect on share value. We also found that earnings components related to investment securities, i.e. securities' unrealized gains and losses, also provide information incremental to earnings when explaining returns. Second, we sought to discover whether manager-reported fair values were not only relevant but *representationally faithful* as well. We did so by isolating only those investments that were "exited" from and comparing the fair value estimates provided by management for four quarters prior to the exit, to the actual cash realized exit value. Since we wish to see whether management forecasts are accurate and unbiased, we focused only on the equity portion of the investment, since the debt portion is not subject to estimation.

We found that fair value estimates provided during the last year before the exit are indeed useful in predicting the actual exit price, and become more accurate and, surprisingly, unbiased as the exit date

draws near. Additionally, the correlation between the historical cost of the disaggregated equity investment and the actual exit value of the investment is quite low, rendering historical cost values un-useful in this circumstance.

In short, we have provided evidence which seems to indicate that ASR 118 is highly important for financial statement users. This, because it allows them access to fair value information that has been found to be both *relevant* and *representationally faithful* in determining the worth of public venture capital firms' investment securities. Furthermore, these results are useful for standard-setters in evaluating the effects of fair value reporting, even for investments that are not traded in active markets.

## ENDNOTES

1. SFAC no. 8, replaced SFAC no. 2 in September 2010. Formerly, accounting numbers were required to be both relevant and reliable. However, due to ambiguity in the term, "reliablility," the FASB chose to replace SFAC no. 2 with the term "representational faithfulness," in order to more precisely define the "reliability" requirement. In so doing, the Board defined "representational faithfulness" as being composed of three characteristics: numbers should be complete, neutral and error free. In our work, we use the term "representational faithfulness," when referring to a formal ruling, but do use the term reliability as well. Considering that FASB views "representational faithfulness" as merely a way to uniformly define the former term, "reliability," we view SFAC no. 8 as an explanation of SFAC no. 2, not a change in ruling.
2. For example, see Barth (1994), Ahmed and Takeda (1995), Bernard, Merton, and Palepu (1995), Petroni and Wahlen (1995), Barth, Beaver and Landsman (1996), Eccher, Ramesh and Thiagarajan (1996), Nelson (1996), Barth and Clinch (1998).
3. For a detailed discussion of the VC lifecycle, see Morsefield and Tan (2006), and Gompers and Lerner (2002).
4. In other countries where corporate tax laws are different, such as Australia, Canada, India, Israel, and the United Kingdom, a much greater percentage of VC's are publicly traded.
5. Further guidance for valuing the portfolio of the public VC funds can be found in AICPA guidelines on "Audits of Investment Companies," Para. 2.27, Emerging Issues Task Force (EITF) Issue No. 85-12 (FASB, 1985), SFAS No. 107 (FASB, 1991), SFAS no. 115 (FASB, 1993), and AICPA Industry Audit Guide, Audits of Banks (1983) (The American Institute of Certified Public Accountants).
6. Factors include: (i) the financial and/or operating results of the most recent fiscal period; (ii) the performance of the company relative to budgets and forecasts; (iii) the company's financial condition and the markets in which it does business; (iv) the prices of recent transactions or offerings; (v) analysis of information regarding the company, or the markets or industry in which it operates; (vi) the nature of any restrictions on the disposition of the securities and other analytical data. In cases of unsuccessful operations, the valuation may be based upon anticipated liquidation proceeds.
7. For a thorough review of the Value-Relevance literature, see Barlev and Haddad 2003.
8. Also see Petroni and Wahlen 1995, Bernard et al. 1995, Barth et al. 1996, Eccher et al. 1996, Nelson, 1996, Barth and Clinch 1998, Higson 1998, Kallapur and Kwan 1998, Muller 1999, Easton 1999, Barth et al. 2001, Kothari 2001, Carroll et al. 2002, Hand 2005.
9. Miller and Modigliani (1966) point out that if markets are complete and perfect, the coefficient on earnings before investment gains and losses would be equal to the reciprocal of the firms cost of capital. Additionally, the coefficient on transitory investment gains and losses would be equal to 1.
10. Data regarding type of exit is not provided for every exit in the sample. We include all exits for which we have information, in this case 242.
11. Industry data is not provided for every exit in the sample. We include the 214 observations which provide industry data.
12. Ownership data is available for the 180 exits recorded here

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