The Journal of Entrepreneurial Finance

Volume 13
Issue 2 *Fall 2009 (Issue 1/2)*

Article 1

December 2009

The Valuation Implications of Sales Growth in Start-up Ventures

Ilanit Gavious
Ben-Gurion University

Dafna Schwartz
Ben-Gurion University

The Journal of Entrepreneurial Finance Volume 13, Issue 2, Fall 2009 1-24

ISSN: 1551-9570

The Valuation Implications of Sales Growth in Start-up Ventures

Ilanit Gavious[*] and Dafna Schwartz[**]

We examine whether and how investors' reliance on financial information is affected by the rate of sales growth of a start-up venture. We find that investors discern between firms by the extent to which their products are adopted by the market. For firms that failed to increase their sales since IPO, investors perceive financial data as not providing relevant or predictive information for investment decision making. In contrast, investors seem to rely heavily on financial information provided by firms presenting a continuous increase in sales. We suggest that investors may perceive firms with a continuous increase (decrease) in sales as those that are (un)able to transfer through the technology adoption lifecycle and make the transition from an early market dominated by a few visionary customers to a mainstream market. Whereas prior studies relate changes in the value-relevance of financial statements to a firm's maturity, as measured on the basis of time (firm age), our findings indicate that the main factor affecting value-relevance is a firm's degree of market penetration.

Keywords: financial statements, market penetration, start-up, sales growth, technology adoption, value-relevance, valuation implications, venture capital.
JEL classification: G1; L26; M13; M41

Introduction

During the past few decades, the number of young technology based firms raising funds through IPO has grown considerably. Concomitantly, academicians as well as practitioners have questioned the relevance of financial statement information to the valuation of these technology-based, fast growing firms (henceforth referred to as 'start-up' ventures/firms). Most notably, these firms are characterized by a high intensity of intangible assets, such as knowledge assets and high R&D expenditures. The present value of their growth opportunities accounts for a larger portion of their market value than the value of assets-in-place (e.g., Brealey and Myers, 1996). In contrast to assets-in-place which do not depend on further discretionary investment by the firm, growth opportunities can be regarded as call options to purchase real assets where ultimate value depends on further discretionary investment (Myers, 1977). This reflects the high risk that characterizes start-up ventures. Another characteristic risk is a high market risk – the risk that firms will not succeed in fulfilling their market expectations as expressed in their prospectuses, and will not manage to reach mainstream markets.[1] This risk is not accounted for by Generally Accepted

[*] Corresponding author: Ilanit Gavious, Guilford Glazer School of Business and Management, Department of Business Administration, Ben-Gurion University, PO Box 653, Beer-Sheva 84105, Israel. Tel.: +972-8-6477538; fax: +972-8-6477691. *E-mail address*: madaril@bgu.ac.il ;

[**] Guilford Glazer School of Business and Management, Department of Business Administration, Co-director of Bengis Center for Entrepreneurship & Hi-Tech Management Guilford Glazer School of Business and Management, Ben Gurion University, PO Box 653, Beer-Sheva 84105, Israel.

Accounting Principles (GAAP), but is probably reflected in securities pricing. Additionally, the large investments in R&D and other intangibles are generally immediately expensed in financial statements according to. GAAP. Hence, reported earnings and book values are usually depressed, often appearing to be of dubious relevance for securities pricing.

This study investigates the valuation implications of sales growth, or the extent of adoption of a new technology, in the post-IPO venture capital (VC) subsector. The analysis is based upon theoretical grounds as well as on empirical data drawn from the Israeli experience during the last decade. Since the beginning of the 1990s, the number of young start-up ventures in Israel has grown from approximately 300 in 1991 to over 3,000 to date. Furthermore, the number of VC funds during the same period increased from just two to over one hundred (Avnimelech and Teubal, 2004 a, b). Israel has been defined as 'the world's most vital place for entrepreneurship' (Haour, 2005). In investigating the sales record of each Israeli start-up firm that went IPO in NASDAQ during the 1990s, we identify two major groups of firms: (1) firms presenting a *continuous* growth in sales since IPO, and (2) firms presenting either stagnation or a *continuous* reduction in sales since IPO. We investigate whether and how a firm's growth in sales versus non-growth in sales affects investors' reliance on its financial statements. Notably, the results of the analyses are robust to partitioning the sample on alternative proxies of growth.

Continuously growing firms, in effect, convert future growth options into assets-in-place. According to Hand (2005, p.614), 'Assuming that a maturing firm converts its existing investment options into assets-in-place faster than it discovers new ones, then its financial statements will reflect greater and greater fractions of its total equity value. Hence…its financial statements will become increasingly associated with its equity value'. We predict that financial statements of firms appearing to consistently increase (decrease) their sales are more (less) value-relevant.

The findings of the current study support our prediction. Investors seem to discern those firms with the potential to continuously increase their sales and expand the market for their products from those that may not have this potential or ability, and they react accordingly. Specifically, we show that investors rely heavily on financial information provided by firms presenting a consistent increase in sales since IPO. This is consistent with financial statements capturing the intensity of assets-in-place (tangible assets) relative to future growth options (intangible assets) (Hand, 2005). In contrast, for firms presenting stagnation or a consistent decrease in sales since IPO, financial data is perceived by investors as not providing relevant, or predictive, information for investment decision making.

An important inference of our findings is that, in effect, investors capture the ability of a technology-based firm to continuously increase its sales as a signal for its potential to smoothly transfer through the stages of the 'Technology Adoption Lifecycle' (Moore, 1999). According to Moore, the market development of high-tech products has unique characteristics that require an appropriate strategy, and the way to develop a high-tech market is by systematically progressing from one group of consumers to another. Making the transition from an early market dominated by a few visionary customers ('early adopters') to a mainstream market dominated by a large block of customers ('early/late majority'') is the main obstacle facing high-technology firms, and is referred to by Moore as 'crossing the chasm'. As a firm's success in making the transition from one segment

of consumers to another will be directly expressed by an increase in its sales, investors are likely to use a sales-based indicator to depict a firm's potential to cross the chasm embedded in the technology adoption lifecycle. Hence, investors could perceive firms presenting a continuous growth (non-growth or reduction) in sales as firms with(out) a potential to gain market majority. In such a case, our results imply that investors' reliance on a firm's financial statements is affected by the perceived ability of the firm to bridge the chasm and make the transition from early adopters to majority.

Another inference of our results is that previous findings regarding the lack of value-relevance of losses (e.g. Hayn, 1995) cannot be generalized across industries or subsectors. In our setting, most growth firms still report losses; we show that the losses as well as the profits are relevant to the valuation of these firms.

This paper contributes to the new innovative firm literature as well as to the accounting and the entrepreneurial finance literature, by exploring growth and technology adoption effects on the value-relevance of firms' financial information. These issues are of crucial importance to the high-tech sector, particularly for start-up ventures. While the few value-relevance studies that focused on the venture capital subsector (e.g. Armstrong, Davila, and Foster, 2006; Hand, 2005) relate changes in the value-relevance of financial statements to a firm's maturity, as measured on the basis of time (firm age), our findings indicate that the main factor affecting this value-relevance is a firm's ability to continuously increase its sales and/or investors' perception of its ability to make the transition through the stages of the technology adoption lifecycle. Furthermore, Hand's (2005) sample consists only of biotech firms, whereas our sample includes firms in a broad range of industries.

The paper proceeds as follows: Section 1 reviews prior literature on the venture investment industry in Israel and on the value-relevance of financial information. Section 2 discusses the sample selection and the conceptual framework, and presents descriptive statistics. Section 3 presents the empirical results as well as a discussion of the results. Section 4 outlines conclusions and practical implications.

1. Literature Review

A. The Venture Investment Industry in Israel

Previous studies have found that the emergence of the venture investment industry in Israel is considered to be the most successful instance of diffusion of the Silicon Valley model of VC outside of North America (Avnimelech and Teubal, 2004a, b; Bresnahan, Gambardella, and Saxenian, 2001; Carmell and de Fontaenet, 2004). The portion of venture investments as a share of GNP in Israel is the highest in the world (OECD 2003) – an average of 1.2 percent for the period 1997-2006 (Avnimelech and Teubal 2006), which is much higher than the averages for the US and for EU countries in this period (Avnimelech and Schwartz, 2009; Schwartz and Bar-El, 2007; NVCA and EVCA, 2007[2]). Another important characteristic of the Israeli high-tech sector is the relatively high portion of start-ups that went IPO. Israel is ranked among the leading countries with the number of startups to go IPO in NASDAQ (Avnimelech and Teubal, 2006).

B. Value-Relevance of Financial Statement Information

The extensive body of research on the value-relevance of financial statement information indicates that GAAP are unsuitable for an economy that increasingly relies on science/technology-based industries. This is because these industries are characterized by large investments in intangibles, such as R&D and intellectual capital, which are generally immediately expensed in financial statements. Hence, reported earnings and book values are usually depressed, often appearing unrelated to market values.

Studies on value-relevance of financial statement (accounting) information investigate the association of equity prices or returns with a set of accounting data, where value-relevance is defined as the information content (measured by the R-square) of the examined data set. Findings show that the value-relevance of financial statements has been consistently declining over the past few decades (Brown, Lo, and Lys, 1999; Francis and Schipper, 1999; Lev and Zarowin, 1999). Core, Guay, and Van Buskirk (2003) differentiate between high-tech and low-tech firms, and document a decline in the relevance of financial accounting to equity valuation for both groups of firms in the 'New Economy Period' (1996-1999).

Studies that focus on the high-tech sector yield mixed results. Hirschey, Richardson, and Scholz (2001) for high-tech firms in general, and Hand (2003) for internet firms in particular, find that both book value of equity and earnings are value-relevant. According to Core et al. (2003), earnings are value-relevant while book value is not. Jorion and Talmor (2001) and Rajgopal, Shevlin, and Venkatachalam (2003) find the opposite results for internet and e-commerce firms – that book values (earnings) are (in)significantly associated with the market values of these firms. Trueman, Wong, and Zhang (2001) show that earnings are not related to internet equity prices (however gross profit *is* significantly positively related to these firms' equity prices). Amir and Lev (1996) show that while neither earnings, cash flows, nor book value of equity are value-relevant for the pricing of cellular firms, for biotechnology firms book values (earnings) are significantly positively (negatively) related to market values. In contrast, Hand (2004) finds that earnings as well as book values are significantly positively related to the market valuation of biotech firms. Callen, Gavious, and Segal (2009) and Ely, Simko, and Thomas (2003) show that market values of biotech firms are positively related to book values and R&D expenditures but not significantly related to earnings before R&D. Hand (2005) compares the value-relevance of financial statements in the pre-IPO venture capital market for biotech firms and the post-IPO public equity market, and finds that financial statements are value-relevant in both. In particular, financial statement data become even more value-relevant as the firm matures, consistent with financial statements capturing the intensity of assets-in-place relative to future growth options. Finally, Armstrong et al. (2006) show that financial statement information is value-relevant in both the pre-IPO and post-IPO periods for a sample of VC-backed firms from six different industries.

It has been demonstrated that when differentiating between earnings and losses, positive (negative) earnings are found to be positively (negatively) related to market values. Core et al. (2003) suggest that the negative coefficient on negative earnings indicates investors' expectations that 'large losses precede higher future cash flows than small losses, possibly due to the transitory

nature of large losses' (p. 56). Callen et al. (2009) explain that investors appear to be aware of accounting deficiencies (such as the treatment of R&D as an expense rather than as an investment) and are able to undo these deficiencies when they draw information from financial statements. The negative coefficient on losses in firms operating in high-tech industries implies that investors can 'see through' the expensing of R&D and other investments in intangibles; the greater the losses, the greater the market value.[3]

Concerns regarding the decline in the relevance of financial accounting to equity valuation have also been expressed by the practitioner community. For example, in 1994 the American Institution of Certified Public Accountants (AICPA) Committee on Financial Reporting (the Jenkins Committee Report) called for the inclusion of important nonfinancial data in firms' financial statements. Indeed, in recent years, international and US Financial Accounting Standard Boards (FASB) have emphasized the recognition and measurement of various types of intangible assets in financial statements.[4] Notably, both international and US FASB are in the process of moving towards fair-value accounting rather than historical-cost accounting (Benston, 2006).

2. Data, Measures and Methodology

The source of our start-up firm data is the Israel Venture Capital (IVC) Online database. The IVC Online database is a comprehensive database on Israel's high-tech industry created by the Israel Venture Capital Research Center. It includes information on Israeli high-tech companies, venture capital and private equity funds, investment companies, professional service providers, foreign investors, and technological incubators.

We extracted non-financial information from the IVC database including: year of IPO, firm discipline, number and year of follow-on offerings, and number of employees at the time of IPO. From the IVC database we also obtain information on share prices and total amount raised in IPOs and seasoned equity offerings (SEOs). Because IVC database does not collect all the information required for this study (particularly financial information), we collected market information – daily share prices and NASDAQ index – from the Yahoo Finance database. Financial statement information was obtained from the database of Yif'at Capital Disc Co. In order to fairly evaluate financial statement information in our tests, we require the financial statements at the end of the annual fiscal period. As our tests require us to calculate changes in certain annual measures, we require not only the most recent annual financial statements but also the financial statements for the prior year.

Our sample consists of 40 Israeli companies backed by VC investors that went IPO in NASDAQ during 1993-2000. In all, 46 Israeli VC-backed companies went IPO in NASDAQ during this period.[5] We were not able to obtain sufficient data to estimate the variables used in our tests for the six start-up ventures excluded from the analysis, as their entire outstanding shares were acquired by other high-tech firms. For each of the 40 sample firms, financial and nonfinancial information was gathered from the time of IPO up until 2004.

We explore the sales record of each of our sample firms since IPO. For each firm, we calculate the percentage change in annual sales in year t as $\Delta t = (S_t - S_{t-1}) / S_{t-1}$, where S_t indicates the total sales at year t. We identify two groups of firms. One group is composed of 21 firms that presented a consistent increase in annual sales since the year of IPO (i.e. a positive Δt). Average sales during the sample period (2001-2004) for this group were 173 percent higher than the sales in the year of IPO, and the average (median) annual increase in sales was 25 percent (13 percent) (p-value: 0.003 (0.001)). The other group (19 firms) consists of 17 firms that presented a consistent decrease in annual sales since the year of IPO (a negative Δt in each year) and two firms with no clear trend in sales. For this group, average sales for the sample period show a decrease of 40 percent from the year of IPO, and the average (median) annual decrease in sales was 6 percent (17 percent) [p-value: 0.099 (0.012)]. We henceforth refer to the two types of firms identified above as continuous growth firms (CG firms) and non-growth firms (NG firms).

To test the robustness of our results to the proxy of growth, we repeat the analyses using a market-value rather than a sales-based indicator (untabulated). In comparison to sales, market value is not an accounting measure extracted from the firm's own financial statements; nonetheless, like sales, it reflects a firm's growth potential. Notably, the results of the analyses are robust to partitioning the sample on these alternative proxies.

We explore whether a continuous growth in sales can be attributed to a firm's maturity, applying three variables typically used in the literature to indicate the maturity of start-up firms: (1) number of years from IPO; (2) firm age; and (3) R&D expenditures per employee. The data indicate that the number of years from IPO does not correlate with the change in sales since IPO, meaning that a firm's rate of sales growth is not associated with the extent of time that passed since IPO. Table 1, panel b shows that the distribution of year of IPO for the two groups of firms is quite similar. Additionally, we find that both groups of firms are very close in age – the average number of years from the date of incorporation for a CG firm is 14 and for a NG firm 13. Likewise, R&D expenditure per employee does not differ significantly between CG and NG firms (average of $45 thousand and $53 thousand, respectively). The results do not change qualitatively when we compare medians rather than averages. Hence, all indicators – number of years from IPO, firm age, and R&D expenditures per employee – show that the (in)ability of CG (NG) firms to increase their sales cannot be attributed to maturity.

The continuous increase (decrease) in sales in our CG (NG) firms also cannot be related to industry-specific factors. Panel a in Table 1 shows that the distribution of firm discipline by NG and CG firms is similar.

As the vast majority of our sample firms went public during the technology boom years (second half of the 1990s; see Table 1, panel b), we restrict our analysis to the years that followed the burst of the technology bubble, namely 2001-2004, resulting in 76 firm-years for NG firms and 84 firm-years for CG firms. This restriction ensures that we have full financial information for the

entire sample period (12 out of the 40 firms in our sample went public in 2000). Additionally, this restriction mitigates bubble market anomalies which otherwise might affect our analysis.

Table 1: Descriptive Statistics

The table provides descriptive statistics on the main financial and nonfinancial information items for our sample, by Non-Growth ('NG') and Continuous Growth ('CG') firms. NG firms are firms presenting either a *continuous* reduction in annual sales since IPO or no clear trend in sales. CG firms are firms presenting a *continuous* growth in sales since IPO. In panels d.1 and d.2, SD is standard deviation. Market Value is based on market value of equity three months after fiscal year-end. Book Value is book value of equity at fiscal year-end. Total Assets is total assets at fiscal year-end. Goodwill and Other Intangible Assets are from the firm's most recent annual financial statement. Sales is total revenues; Sales_ch (percent) is percentage change in revenues from the preceding year. Earnings (CFO)-to-Price is the ratio of earnings before extraordinary items (cash flows from operations) to market value. R&D-to-Sales and R&D-to-Assets is R&D intensity measured as R&D expense divided by total revenues and total assets, respectively. Unscaled financial data are measured in $millions. Extreme values (top and bottom 1 percent) of continuous variables are winsorized.

Panel a: Distribution of Firm Discipline – percent

	NG Firms	**CG Firms**
Communications, telecommunications, wireless communications	39	29
E-commerce, internet, software	44	48
Semiconductors, electronics	6	10
Medical devices, biotechnology	11	10
Miscellaneous technologies/hardware, printing	0	5
Total	**100**	**100**

Panel b: Distribution of Year of IPO (number of firms)

	1993	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**Total**
NG Firms	1	0	5	2	1	4	6	**19**
CG Firms	3	1	3	1	3	4	6	**21**

Panel c: Distribution of Follow-On Offerings – percent

Follow-on Offerings	**NG Firms**	**CG Firms**
0	33	19
1	50	33
2-3	17	48

Total	**100**	**100**

Table 1 – continued

Panel d.1: Financial Data – NG Firms

Variable	Mean	Median	SD	Skewness	Kurtosis
Market Value	79	29	175	5.287	32.533
Book Value	33	16	47	4.160	23.001
Total Assets	47	29	56	3.010	12.334
Goodwill	1	0	5	3.936	15.100
Other Intangible Assets	0.2	0	0.6	3.137	8.675
Sales	17	11	23	3.463	14.794
Sales_ch (percent)	-0.060	-0.172	0.927	4.500	24.677
Earnings-to-Price	-0.769	-0.235	2.051	-6.318	44.133
CFO-to-Price	-0.439	-0.112	1.002	-3.781	18.561
R&D-to-Sales	1.383	0.396	4.602	6.976	52.048
R&D-to-Assets	0.237	0.198	0.157	1.592	2.219
Amount Raised at IPO	36	40	17	-0.265	-0.799
# Employees at Time of IPO	164	149	145	2.418	6.154
Amount Raised at IPO/ # Employees	0.308	0.258	0.195	1.323	1.209

Panel d.2: Financial Data – CG Firms

Variable	Mean	Median	SD	Skewness	Kurtosis
Market Value	700	151	1,477	2.874	7.711
Book Value	177	86	303	3.384	12.057
Total Assets	298	117	472	2.627	6.136
Goodwill	24	0	66	4.422	21.037
Other Intangible Assets	6	0	10	2.181	4.551
Sales	118	58	147	2.087	3.778
Sales_ch (percent)	0.248	0.127	0.768	4.425	24.747
Earnings-to-Price	-0.289	-0.013	1.424	-7.441	58.191
CFO-to-Price	-0.051	0.011	0.341	-3.723	23.016
R&D-to-Sales	0.209	0.179	0.318	0.623	14.772
R&D-to-Assets	0.092	0.091	0.065	-0.675	1.504
Amount Raised at IPO	44	39	34	1.526	3.482
# Employees at Time of IPO	435	251	419	1.712	2.384

Amount Raised at IPO/ # Employees	0.204	0.098	0.197	0.663	-1.078

Table 1 provides descriptive statistics on the major financial and non-financial information items for the two groups of firms. The sample consists of start-up firms from various disciplines. The distribution of firm discipline by NG and CG firms is presented in panel a. About half of the IPOs for both NG and CG firms occurred in 1999-2000, the peak of the technology boom years (Table 1, panel b). Nineteen percent of CG firms had no follow-on offerings compared with 33 percent of NG firms. On the other hand, almost 50 percent of CG firms had two or three follow-on offerings compared with only 17 percent of NG firms (Table 1, panel c).

Panels d.1 and d.2 of Table 1 – for NG and CG firms, respectively – provide various descriptive variables generally used in value-relevance studies on high-tech industries (see, e.g. Amir and Lev 1996; Callen et al. 2009; Ely et al. 2003). The differences between NG and CG firms are highly significant (at the 1 percent level) according to both parametric and non-parametric tests for all financial variables. It is evident that CG firms are much larger than NG firms according to all three size measures. Market value of CG firms is, on average, almost nine times the market value of NG firms, and the book value of equity and total assets from the balance sheets of CG firms are around six times that of NG firms.

Investments in intangible assets are also much larger in CG firms. For example, goodwill amounts to $24 million in CG firms, on average, in comparison to only $1 million in NG firms (notably, more than 75 percent of NG firms had no goodwill in their balance sheets), indicating that the former were more active in corporate mergers and acquisitions. GAAP allow goodwill, as well as other intangible assets, to be included in the balance sheet only when they are purchased. Thus, the large investments in R&D and other intangibles such as customer-base, patents, and intellectual capital, are largely expensed in financial statements and are not included as assets in the balance sheet.

CG firms dominate NG firms also in the amounts of annual sales ($118 million compared with $17 million on average, respectively). Whereas CG firms present an increase in annual sales according to both mean and median (25 percent and 13 percent, respectively), NG firms' sales decrease [-6 percent (-17 percent) on average (median)]. The ratios of Earnings-to-Price and Cash Flows from Operations (CFO)-to-Price indicate that most NG firms report losses and negative cash flows from operations (88 percent and 80 percent of the firm-year observations, respectively). Although on average these ratios are also negative for CG firms, the frequency of firms with losses and negative cash flows in this group is smaller (56 percent and 42 percent of the firm-year observations, respectively). The depressed earnings and cash flows from operations in start-up firms in general are consistent with the large intensity of R&D costs, which are, as stated, usually fully expensed as incurred in accordance with accounting principles.[6] It can be seen in Table 1 that R&D intensity, taken either relative to sales (R&D-to-Sales) or to total assets (R&D-to-Assets), is much higher for NG firms. This is not surprising, given the large costs of R&D and low revenues for most NG firms. The higher intensity of R&D may be attributed to the efforts of NG firms to increase their market penetration.

Finally, the amount raised at IPO per employee is lower for CG firms [mean (median) $0.20 ($0.10) millions] relative to NG firms [mean (median) $0.31 ($0.26) millions]. This may be explained by CG firms naturally having more employees. Additionally, a relatively higher portion of a CG firm's budget is gained through sales, and thus the amounts of money needed to be raised from the public relative to the firm's size are lower in comparison to a NG firm.

3. Results

In our study we use both return analysis and price level analysis consistent with prior value-relevance studies (e.g. Amir and Lev, 1996; Callen et al., 2009). Also consistent with the literature (e.g. Collins et al., 1997; Hand, 2005), we run regressions of stock prices and returns on combinations of financial statement data items, where we define value-relevance as the adjusted R-square from these regressions. In each regression analysis we mitigate the effects of outliers by winsorizing observations in the top and bottom one percent of the dependent and independent variables. We winsorize outliers instead of deleting them to conserve data. Results do not change qualitatively when outliers are deleted. The regressions are estimated using panel data (the same firms in successive years) with firm discipline and year fixed effects. Namely, we include intercept dummies for each firm discipline and year to capture constant industry-specific and year-specific factors.[7] The regressions include White's (1980) correction. We conduct diagnose tests for our regressions including collinearity diagnostics and residual diagnostics (e.g., VIF and Durbin-Watson tests). The tests indicate that our regressions follow the standard conditions; i.e., we reject the hypotheses (1) that multicollinearity exists between one independent variable and other independent variable, (2) that a serial correlation of the residuals exists, and (3) that disturbances in all regressions are not normally distributed.

A. Return Analysis

This section establishes the value-relevance of financial statement information in NG and CG firms using narrow- and wide-window returns analyses. First, we examine the association of the three- and seven-day abnormal returns centered on the annual earnings announcement date [CAR (-1,1) and CAR (-3,3), respectively] with the level and change in earnings. Second, we examine the association of annual returns with the level and change in earnings.[8] Because GAAP-based earnings are considered to be of limited value to investors in firms operating in fast changing, technology-based industries, we also run the same specifications with cash flows from operations (CFO) instead of earnings consistent with prior studies (see, e.g. Amir and Lev, 1996).

The narrow return windows regressions are based on prior literature (e.g. Amir and Lev, 1996; Callen et al., 2009). Utilizing Easton and Harris's (1991) return version of the Ohlson (1995) model, we run the following regression:

$$CAR_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 \Delta E_{it} + \varepsilon_{it} \qquad (1)$$

where CAR is the size adjusted cumulative abnormal returns of firm i in the three or seven days centered on the earnings announcement; E is the annual earnings per share (before extraordinary items) deflated by the beginning of year price per share; and ΔE is the change in earnings per share (before extraordinary items) from the previous year deflated by the beginning of year price per share. As stated above, we run the same specification with CFO instead of E.[9]

The regressions results are presented in Table 2. Panel a shows that for NG firms both the coefficients on the level and change in earnings are statistically insignificant in the three and seven-day return windows, as are the F-values (zero R-square). For CG firms, on the other hand, the coefficients on earnings and the change in earnings are significant and positively related to abnormal returns (according to both time windows). The same inferences are obtained when we substitute cash flows from operations for earnings (displayed in panel b). From these results, it is apparent that investors do not react either to earnings or to cash flows from operations reported by NG firms, but they do react when reported by CG firms. When we compare between the coefficients on cash flows and the coefficients on earnings we find that the former are significantly larger for CG firms (p-value: 0.000). The difference in the magnitude of the coefficients indicates that cash flows and earnings have different valuation characteristics for CG firms, i.e., current cash flows from operations play a more important role as proxy for expectations about the future cash flows of firms with an increasing level of product penetration.

Table 2: Regressions of Abnormal Returns Surrounding Earnings Announcements

The dependent variable is the cumulative abnormal return in the three and seven days centered on earnings announcements. E (CFO) is annual earnings per-share before extraordinary items (cash flows from operating activities per share) and ΔE (ΔCFO) is the change in E (CFO), both deflated by initial period price per share. The change in earnings per share is computed as earnings minus the earnings reported in the preceding year. To mitigate the effect of outliers, we winsorize the top and bottom 1 percent of the regression variables. P-values of the coefficients are presented in parentheses. The regressions are estimated using panel data including industry- and year-fixed effects.

Panel a: Regressions on Earnings and Change in Earnings

	NG Firms		**CG Firms**	
	CAR (-3,3)	**CAR (-1,1)**	**CAR (-3,3)**	**CAR (-1,1)**
Intercept	-0.194 (0.134)	-0.145 (0.208)	0.016 (0.928)	0.011 (0.947)
E	-0.041 (0.809)	0.021 (0.889)	2.062 (0.000)	2.085 (0.000)
ΔE	0.010 (0.922)	-0.036 (0.697)	0.959 (0.000)	0.972 (0.000)
F-value	0.634 (0.851)	0.425 (0.973)	19.644 (0.000)	20.370 (0.000)
Adj_R^2	0	0	0.68	0.69
N	76	76	84	84

Panel b: Regressions on Cash Flows and Change in Cash Flows

	NG Firms		CG Firms	
	CAR (-3,3)	**CAR (-1,1)**	**CAR (-3,3)**	**CAR (-1,1)**
Intercept	-0.018 (0.880)	0.000 (0.999)	0.830 (0.025)	0.833 (0.026)
CFO	-0.145 (0.505)	-0.197 (0.304)	7.971 (0.000)	8.051 (0.000)
ΔCFO	0.021 (0.879)	0.033 (0.782)	3.835 (0.000)	3.877 (0.000)
F-value	0.713 (0.779)	0.581 (0.892)	14.666 (0.000)	13.638 (0.000)
Adj_R^2	0	0	0.64	0.63
N	76	76	84	84

The annual return regression is formulated as:

$$Ann\_R_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 \Delta E_{it} + \varepsilon_{it} \qquad (2)$$

Ann_R is computed from nine months before fiscal year-end to three months after fiscal year-end. The results of the annual regressions, presented in Table 3, are consistent with those obtained from the narrow return window regressions. Whereas the coefficients on earnings (cash flows) and the change in earnings (cash flows) are insignificant for NG firms, they are significantly positive for CG firms at the 1 percent level. Again, for CG firms, the coefficients on the cash flow variables are significantly larger than the coefficients on the earnings variables, indicating that cash flows are more relevant for explaining equity values. The difference in the value implications of earnings and cash flows is further pronounced in the sign differences of the coefficients on ΔE and ΔCFO in NG firms. Specifically, NG firms have a lower coefficient on the change in earnings than CG firms, however with the same positive sign. In contrast, when the change in cash flows is used, the coefficient for NG firms becomes negative.

Additionally, for NG firms, the F-value as well as the R-square is significant only for the annual return regressions and not for the narrow-window return regressions. We find that this significance is due to the time and industry fixed effects. Excluding the fixed effects from NG firms' annual returns regression on earnings variables, the F-value and adjusted R-square are 0.23 (p-value: 0.795) and 0, respectively. Without the fixed effects the adjusted R-square of the annual returns regression on cash flows variables is 0.02 and the F-value is 1.55 (p-value: 0.221).

The results thus far imply that financial statement information is highly value-relevant for CG firms but value-irrelevant for NG firms. We contend that the difference in the valuation of earnings in CG versus NG firms is not due to differences in the valuation of profits and losses

documented in prior studies (e.g. Collins, Maydew, and Weiss, 1997; Collins, Pincus, and Xie, 1999; Hayn, 1995). Hayn (1995) shows that in regressions of annual returns on earnings, earnings are virtually value-irrelevant for loss firms. Collins et al. (1997) and Collins et al. (1999) show similar results for a regression of price on book value and earnings. Notably, CG and NG firms in our study do not represent profit or loss firms, respectively. Although the frequency of loss firm-years within our sample of NG firms is naturally higher, most CG firms also report losses (an average of -0.29 earnings-to-price ratio, see Table 1, panel d.2.). Thus, a 'permanent' versus 'transitory' earnings explanation is also irrelevant in this case, as CG firms cannot be considered as generating permanent earnings. Our findings imply that for start-up firms with an increasing level of product penetration, earnings are perceived as value-relevant even if these firms still do not generate profits (i.e., even if the earnings are negative). These results suggest that prior findings regarding the lack of value-relevance of losses cannot be generalized across industries or subsectors, such as the VC subsector.

Table 3: Regressions of Annual Returns

The dependent variable is annual returns. It is computed from nine months prior to fiscal year-end to three months after fiscal year-end. E (CFO) is annual earnings per-share before extraordinary items (cash flows from operating activities per share) and ΔE (ΔCFO) is the change in E (CFO). The independent variables are deflated by the beginning of year stock price. To mitigate the effect of outliers, we winsorize the top and bottom 1 percent of the regression variables. P-values of the coefficients are presented in parentheses. The regressions are estimated using panel data with industry- and year-fixed effects.

Panel a: Regressions on Earnings and Change in Earnings

	NG Firms	**CG Firms**
Intercept	0.700 (0.545)	0.087 (0.947)
E	1.084 (0.489)	1.457 (0.000)
ΔE	0.227 (0.810)	0.741 (0.007)
F-value	4.215 (0.000)	11.590 (0.000)
Adj_R^2	0.34	0.59
N	76	84

Panel b: Regressions on Cash Flows and Change in Cash Flows

	NG Firms	CG Firms
Intercept	0.348 (0.763)	-0.752 (0.439)
CFO	1.579 (0.446)	7.493 (0.000)
ΔCFO	-0.362 (0.778)	3.668 (0.003)
F-value	3.909 (0.000)	22.507 (0.000)
Adj_R^2	0.32	0.68
N	76	84

B. Level Analysis

The price regressions are based on a version of the Ohlson (1995) model:[10]

$$P_{it} = \beta_0 + \beta_1 BV_{it} + \beta_2 E_{it} + \varepsilon_{it} \qquad (3)$$

where P is the price per share three months after fiscal year-end, BV is the book value of equity per share, and E is earnings per share before extraordinary items. We test the robustness of our results to the scaling variable, using an additional, commonly used deflator – total assets – instead of total shares outstanding (Easton and Sommers, 2002). Using total assets as a deflator results in inferences throughout that are qualitatively the same.

Table 4, panel a presents the results for the price regression. As in the returns analysis, we also present results for when earnings are replaced with cash flows from operations. Consistent with the results obtained in the returns analysis, we find a strong relation between financial statement information and stock prices in CG firms. The coefficients on book value, earnings, and cash flows from operations are positive at the 1 percent level. The coefficient on cash flows from operations is again significantly larger than the coefficient on earnings. When we allow positive and negative earnings to have different slope coefficients, as well as different intercepts, we find no difference in the valuation of profits and losses (the coefficient on negative earnings does not differ significantly from the coefficient on positive earnings), indicating that the greater the earnings (losses), the greater (lower) the market value. Prior studies that document negative coefficients on negative earnings relate this finding to the extensive expensing of R&D as mandated by GAAP, which artificially depresses earnings. For example, in the study of Callen et al. (2009), R&D expenditures in a sample of drug development firms are, on average, 14 times their total sales. In this setting, firms predominately report losses, however the market seems to be aware of the accounting deficiencies and treats R&D as an investment rather than as an expense (see 'The Venture Investment Industry in Israel' in the Literature Review). Our sample of CG firms, on the other hand,

is not characterized by a high R&D intensity; rather, R&D expenditures are, on average, about 20 percent of total revenues. Thus, the market does seem to relate lower valuations to those firms that are not able to generate positive profit margins from their sales, as these firms already dominate the market majority.

Table 4: Price Regressions

The table shows the regression results of market value of equity on financial variables. The dependent variable is price per share three months after fiscal year-end. BV is book value per share at fiscal year-end; E is annual earnings per share before extraordinary items; CFO is cash flows from operating activities per share; TANG_ASS is tangible assets per share; INTANG_ASS is intangible assets per share (including goodwill and other intangibles); TOT_LIAB is total liabilities per share; R&D is research and development expenditures per share; E_R&D is annual earnings per share before R&D and extraordinary items. To mitigate the effect of outliers, we winsorize the top and bottom 1 percent of the regression variables. The regressions are estimated using panel data with industry- and year-fixed effects and include White's (1980) correction. P-values of the coefficients are presented in parentheses.

Panel a: Price Regressions on Accounting Fundamentals

	NG Firms		**CG Firms**	
Intercept	10.638 (0.050)	37.746 (0.000)	1.637 (0.724)	4.567 (0.126)
BV	-4.020 (0.236)	-5.799 (0.110)	1.726 (0.009)	0.956 (0.019)
E	-2.484 (0.120)		1.758 (0.005)	
CFO		-2.740 (0.152)		2.033 (0.005)
Adj_R^2	0.22	0.22	0.63	0.61
F-value	2.426 (0.010)	2.383 (0.011)	15.863 (0.000)	14.338 (0.000)
N	76	76	84	84

Panel b: Price Regressions on Components of Financial Statements

	NG Firms	**CG Firms**
Intercept	-7.016 (0.108)	-1.261 (0.868)
TANG_ASS	-0.549 (0.875)	2.080 (0.008)
INTANG_ASS	-1.246 (0.888)	-0.305 (0.874)
TOT_LIAB	9.727 (0.010)	-0.925 (0.337)
E_R&D	-2.605 (0.146)	1.546 (0.016)
R&D	-0.039	0.543

	(0.995)	(0.095)
Adj_R^2	0.37	0.65
F-value	4.511 (0.000)	15.515 (0.000)
N	76	84

In contrast to CG firms, the coefficients on all three accounting fundamentals are unusually negative and insignificant for NG firms (the coefficient on cash flows from operations is more negative than the coefficient on earnings). The insignificant, counter-intuitive coefficients combined with the evidence from the returns analyses cast doubt on the usefulness and relevance of financial statements for the pricing of NG firms' securities. The relatively large adjusted R-square (0.22) and significant F-values in the regressions for NG firms are again due to time and industry fixed effects. Without these effects, adjusted R-square and F-value for the regression on book value and earnings (cash flows) are 0 and 0.883, p-value: 0.419 (0 and 1.025, p-value: 0.366). It seems that financial statements contain less information with respect to the value of start-up firms that fail to increase their sales subsequent to the IPO, or what is more, suffer from a continuous reduction in sales in comparison to firms that continuously increase sales. Hence, the variation in the values of NG firms remains to be explained by other explanatory variables which are omitted from regression (3), and are probably not correlated with the explanatory financial statement variables. Markedly, whereas the market value of CG firms comprises a larger portion of the present value of growth opportunities relative to the value of assets-in-place, and while these growth opportunities are best regarded as risky call options to make future investments (Myers, 1977), conservative accounting information is still more value relevant for CG firms than it is for NG firms.

We repeat the return and level analyses by adding to the regression firm age and R&D expenditure per employee to capture firms' maturity. Both variables have insignificant coefficients in all regressions, and the results remain qualitatively the same. Additionally, we apply a pooled sample specification in which each of the explanatory variables is also interacted with firm age. We find that the coefficients on these interactive variables are insignificantly different from zero. This further emphasizes that investors in start-up firms are, in fact, affected by a firm's proven ability to continuously increase its market penetration, rather than by other conventional indicators of a firm's maturity, such as age.[11] Once the ability of the firm to consistently increase sales is accounted for, these other indicators do not have an incremental affect on an investor's reaction to the firm's financial information. Finally, we repeat the return and level analyses, where we employ tests of the joint sample of CG and NG firms, with a sales growth dummy. The inferences are similar and as robust as those reported.

Upon regressing prices on financial variables, we also decompose book value of equity and earnings into their major components.[12] Book value of equity is decomposed into tangible assets (TANG_ASS), intangible assets (INTANG_ASS), and total liabilities (TOT_LIAB). Earnings are decomposed into research and development expenditures (R&D) and earnings before research and development expenditures (E_R&D), consistent with prior research on high-technology, science-based industries (e.g. Amir and Lev, 1996; Callen et al., 2009; Ely et al., 2003). Table 4, panel b

displays the regressions results. For CG firms, we find that tangible assets, earnings before R&D, and the level of R&D expenditures are significantly positively related to stock prices. The positive coefficients on R&D and earnings before R&D are consistent with the literature on R&D valuation (e.g. Amir and Lev, 1996; Bowen and Shores, 2000; Callen et al., 2009; Chambers, Jennings, and Thompson, 1998; Ely et al., 2003; Hand, 2005; Lev and Sougiannis, 1996; Shortridge, 2000). Ely et al. (2003) find that earnings before R&D are significant and positively related to market value only for biotech firms that have approved drugs, i.e. firms that generate revenues and are beyond the development stage. For a sample of drug development firms (i.e. firms that are still in the development stage), Callen et al. (2009) indeed find that the coefficient on earnings before R&D is positive but not significantly different from zero. Equivalent to these findings, the coefficient on earnings before R&D is significantly positive for our sample of start-up firms that have succeeded to generate continuously increasing revenues since IPO. The insignificant, nonsensical (negative) sign of the coefficient on intangible assets is not surprising. Although the intrinsic value of technology-based firms derives mainly from intangible assets, these are usually not fairly represented in the balance sheet as they are either immediately expensed or arbitrarily amortized (see, e.g. Amir and Lev, 1996). The undervaluation of intangible assets in the balance sheets of our sample firms is reported in Table 1, panels d.1 and d.2. These balance-sheet items are of dubious relevance to the pricing of start-up firms in general. Tangible assets, on the other hand, are found to be highly significantly related to the pricing of CG firms. Hand (2005) shows that as the firm matures, financial statement information becomes more value-relevant. He explains that this is consistent with financial statements capturing the intensity of on-balance-sheet assets-in-place (tangible assets) relative to future investment options (intangible assets). When we separate tangible assets into cash and non-cash assets, we find that the coefficients on both are positive and significant at the 1 percent level. The coefficient on total liabilities is, as expected, negative though insignificant (see also Hand, 2005).

For NG firms the coefficients on tangible assets, intangible assets, R&D, and earnings before R&D all have counter-intuitively negative signs and are statistically insignificant, while the coefficient on total liabilities is significantly positive. When we run the regression without year- and industry-fixed effects, the regression remains significant at the 1 percent level with an adjusted R-square of 19 percent. The only significant coefficient remaining is that of total liabilities (7.018, p-value: 0.000). A possible explanation for the positive relation between the liabilities of NG firms and market values is that these liabilities are positively correlated with what the market conceives as these firms' potential to survive. The market searches for indicators for the potential of such firms to increase their market penetration, that is, to develop a continuously growing market for their products. The liabilities indicate that the NG firm was able to get creditors to invest in it. This ability may indirectly serve as a positive signal to investors, since more liabilities imply that creditors believe in the firm, or at least are willing to take the risk of doing business with it.

C. Discussion: The Moore 'Technology Adoption Lifecycle' Model

Our findings indicate that investors are able to discern those firms with the potential to continuously increase their sales and expand the market for their products from those that may not have this potential or ability, and then react accordingly.

In his book *Crossing the Chasm,* Moore (1999) deals with the market development of high-tech products and presents a 'Technology Adoption Life Cycle' model. According to Moore, the way to develop a high-tech market is by systematically progressing from one group of consumers to another, 'focusing first on the innovators, growing that market, then moving on to the early adopters, growing that market, and so on, to the early majority, late majority, and even to the laggards' (p.14). These groups are distinguished by their characteristic response to a new, discontinuous innovation based on a new technology. Each group represents a different psychographic group that is composed of a combination of psychological and demographic profiles.[13] Different psychographic profiles imply that when purchasing a product, different groups have different considerations. In other words, the group has a difficult time accepting a new product if it is marketed in the same way as it was marketed to the previous group. This lack of continuity in each transition from one group to another bears with it an inherent risk of the marketing losing its momentum, hence missing the transition to the next group of consumers and possibly missing out on a large market where the real profit is (obviously, the main goal is to gain profit-margin leadership).[14]

In the model, a gap is introduced between each two groups. The gaps reflect the lack of continuity in the transition from one group to another. Moore (1999) distinguishes between two types of gaps: a crack and a chasm. A crack is considered the less significant of the two, and there are three of these across the curve. The first is between the innovators and the early adopters, the second falls between the early majority and the late majority, and the third is between late majority and the laggards. The chasm is more substantial, in that it separates the early adopters from the early majority. Moore explains that the transition from early adopters to early majority is the most difficult, and as it typically goes unrecognized the risk of falling into the chasm is extremely high.

Markedly, while the marginal investor in the market can easily track a firm's sales, identifying its exact stage in the technology adoption lifecycle is not straightforward. As a firm's success in making the transition from one segment of consumers to another should be directly expressed by an increase in its sales, the market is likely to use a sales-based indicator to capture a firm's potential to bridge the gaps embedded in the technology adoption lifecycle. Hence, a possible inference of our findings is that investors, in effect, denote a firm's ability to continuously increase its sales as a signal for its ability to cross the chasm and make the transition from an early market dominated by a few visionary customers to a mainstream market. In contrast, a firm with continuously decreasing sales (or lacking a positive trend in sales) may not succeed in making this transition, and is more likely to be 'stuck' in the early adopters segment. Our findings, therefore, may indicate that investors' reliance on a firm's financial statements is affected by the perceived ability of the firm to cross the chasm. Indeed, the transition from early adopters to majority indicates a conversion of future growth options into assets-in-place, and thus financial statement information should be more relevant for the pricing of market majority firms. On the other hand, firms in the stage of early adopters may have greater future growth options ('positive intangibles')

which are not represented in their financial statements, or they may fall into the chasm – a risk that is also not represented in financial statements ('negative intangibles'). Neither the opportunities nor the risks are represented in their financial statements. The high degree of uncertainty with regard to the future prospects of these firms leads to investor skepticism as to the reliability or relevance of their financial statements.

4. Summary and Concluding Remarks

We examine whether and how investors' reliance on financial information is affected by the sales growth of a start-up venture. We find that investors seem to be able to discern those firms with the potential to continuously increase their sales and expand the market for their products from those firms that may not have this potential or ability, and they react accordingly. For the latter, financial data are perceived by investors as not providing relevant, or predictive, information for investment decision making. In contrast, the results show that investors rely heavily on financial statement information provided by continuously growing firms, consistent with the fact that financial statements capture the intensity of assets-in-place relative to potential growth options. Once the ability of the firm to continuously increase its sales is accounted for, other indicators used in prior studies to capture a firm's maturity (e.g. firm age) do not have an incremental affect on an investor's reaction to the firm's financial information. We conclude that changes in the value-relevance of financial statements of science-based, fast growing firms are related to the degree of these firms' market penetration rather than to their maturity as measured on the basis of time.

We suggest that investors may interpret a firm's ability to continuously increase its sales as an ability to transfer through the stages of the technology adoption lifecycle. In such a case, our results imply that investors' reliance on a firm's financial statements is affected by its perceived ability to bridge the chasm embedded in the technology adoption lifecycle and to make the transition from early adopters to a mainstream market. An important implication of this inference is that young high-tech firms should not be evaluated before their stage in the technology adoption life cycle is identified. The firm's stage in the technology adoption life cycle can have an acute influence on the data that constitutes a base for evaluation, and thus, on the most appropriate methodology for evaluation. Should the accounting data be irrelevant for firm valuation, analysts and investors need to identify which off-balance-sheet data are value-relevant for the specific firm.

Notes

[1] See, for example, Armario, Ruiz, and Armario (2008); Hering, Olbrich, and Steinrucke (2006).

[2] NVCA – National Venture Capital Association (www.nvca.org)
EVCA – European Venture Capital Association (www.evca.com)

[3] Some of these studies also examine the value-relevance of nonfinancial information and the relationship between financial and nonfinancial information in explaining stock pricing (e.g. Amir and Lev, 1996; Callen et al., 2009; Ely et al., 2003; Hand, 2005). The examination of nonfinancial information is possible when focusing on a specific firm discipline within the high-tech sector (e.g. telecommunications, biotechnology, e-commerce) because each discipline is characterized by different value-relevant nonfinancial data [i.e. nonfinancial information is typically discipline/industry-specific; for example, drug development stage for biotech firms, market penetration (number of subscribers) for cellular firms, etc.]. Our study, on the other hand, is based on start-up firms from various disciplines which make an investigation of the value-relevance of nonfinancial information impractical. See also, Amir and Lev (1996, p.6).

[4] For example, International Financial Reporting Standard No. 3 (IFRS 3), 2004, *Business Combinations*.

[5] The list of companies was drawn from the Israel Venture Capital (IVC) Online database. Various sampling procedures employed resulted in smaller samples which have yielded similar qualitative results as those presented in the paper. However employing smaller samples reduced the robustness of the statistical tests. We thus choose to use all of the available data.

[6] FASB Statement No. 2: *Accounting for Research and Development Costs*.

[7] We also run the regressions without the fixed effects. Inferences remain qualitatively the same.

[8] Callen et al. (2009) also employ annual returns regressions in addition to narrow return windows regressions.

[9] As the change in earnings - not the level of earnings - drive returns (the latter is used in the return regressions as a control variable), we conduct a sensitivity analysis where we run regressions including only the change in earnings (or cash flows). Inferences remain the same as those reported in the tables.

[10]This price regression specification is commonly used to examine the relation between price and the two summary financial statement measures, book value of equity and earnings.

[11] We point out that the findings documented in this study may not be interpreted as indicative of established, mature firms simply having accounting fundamentals that are more descriptive of investors' future expectations. In particular, NG and CG firms in our sample do not differ significantly either in age or in the number of years from IPO. Additionally, as shown above, most CG as well as NG firms still report losses.

[12] According to Hand (2005), the use of major components of the aggregate book value of equity and net income helps to avoid 'the severe inferential distortions that can arise when evaluating the value relevance of financial statements of fast growing, highly intangible-intensive companies' (Hand, 2004; Zhang, 2001).

[13] For the definition and specific characteristics of each segment, see Moore (1999, pp.9-13).

[14] Branscomb and Auerswald (2001) explain that operating risks of technology-based emerging industries may be measured by the probability that the firm will not meet its sales forecasts.

References

AICPA Special Committee on Financial Reporting, 1994, Improving Business Reporting – A Customer Focus, American Institute of Certified Public Accountants, New York.

Amir, E., and B. Lev, 1996, "Value-relevance of nonfinancial information: The wireless communications industry", Journal of Accounting and Economics 22, 3-30.

Armario, J.M., D.M. Ruiz, and E.M. Armario, 2008, "Market orientation and internationalization in small and medium-sized enterprises", Journal of Small Business Management 46 (4), 485-512.

Armstrong, C., A. Davila, and G. Foster, 2006, "Venture-backed private equity valuation and financial statement information", Review of Accounting Studies 17, 119-154.

Avnimelech, G., and M. Teubal, 2004a, "Strength of market forces and the successful emergence of Israel's venture capital industry: Insights from a policy-led case of structural change", Revue Economique 55 (6), 1265-1300.

Avnimelech, G., and M. Teubal, 2004b, "Venture capital – start up co-evolution and the emergence and development of Israel's new high tech cluster, Part 1: Macroeconomic and industry analysis", Economics of Innovation and New Technology 13 (1), 33-60.

Avnimelech, G., and M. Teubal, 2006, "Creating venture capital (VC) industries that co-evolve with high tech clusters: Insights from an extended industry life cycle perspective of the Israeli experience", Research Policy 35 (10), 1477-1498.

Avnimelech, G., and D. Schwartz, 2009, "Structural transformation of regional venture capital industry: Evidence from Israel", Innovation: Management, Policy and Practice (IMPP) 11 (1), forthcoming.

Benston, G.J., 2006, "Fair-value accounting: A cautionary tale from Enron", Journal of Accounting and Public Policy 25, 465-484.

Bowen, R., and D. Shoresm, 2000, "Economic context and the value relevance of accounting data", University of Washington, Seattle, Working Paper.

Branscomb, L.M., and P.E. Auerswald (eds.), 2001, "Taking Technical Risks. How Innovators and Investors Manage High Tech Risks", The MIT Press.

Brealey, R.A., and S.C. Myers, 1996, Principles of Corporate Finance (5th edition), McGraw-Hill.

Bresnahan, T., A. Gambardella, and A. Saxenian, 2001, "Old economy inputs for new economy outputs: Cluster formation in the new Silicon Valleys", Industrial Corporate Change 10 (4), 835-860.

Brown, S., K. Lo, and T. Lys, 1999, "Use of R2 in accounting research: measuring changes in value relevance over the last four decades", Journal of Accounting and Economics 28, 83-115.

Callen, J.L., I. Gavious, and D. Segal, 2009, "The complementary relationship between financial and non-financial information in the biotechnology industry and the degree of investor sophistication", University of Toronto, Working Paper.

Carmell, A., and C. De Fontaenet, 2004, "Israel's Silicon Vadi", *In*: Bresnahan, T. and Gambardella, A. (eds.), Building High Tech Clusters: Silicon Valley and Beyond, Cambridge: Cambridge University Press**.**

Chambers, D., R. Jennings, and R. Thompson, 1998, "Evidence on the usefulness of capitalizing and amortizing research and development costs", University of Texas, Austin, Working Paper.

Collins, D.W., E.L. Maydew, and I.S. Weiss, 1997, "Changes in the value-relevance of earnings and book values over the past forty years", Journal of Accounting and Economics 24, 39-67.

Collins, D.W., M. Pincus, and H. Xie, 1999, "Equity valuation and negative earnings: The role of book value of equity", Accounting Review 74 (1), 29-61.

Core, J.E., W.R. Guay, and A. Van Buskirk, 2003, "Market valuations in the new economy: An investigation of what has changed", Journal of Accounting and Economics 34, 43-67.

Easton, P.D., and T.S. Harris, 1991, "Earnings as an explanatory variable for returns", Journal of Accounting Research 29, 19-36.

Easton, P., and G. Sommers, 2002, "Scale and the scale effect in market-based accounting research", Journal of Business, Finance, and Accounting 30 (1-2), 25-56.

Ely, K., P.J. Simko, and L.G. Thomas, 2003, "The usefulness of biotechnology firms drug development status in the evaluation of research and development costs", Journal of Accounting, Auditing and Finance 18, 163-196.

Financial Accounting Standards Board; SFAS No. 2: Accounting for Research and Development Costs. (Stamford, Conn.: FASB, 1974).

Francis, J., and K. Schipper, 1999, "Have financial statements lost their relevance?", Journal of Accounting Research 37, 319-352.

Hand, J.R.M., 2003, "Profits, losses and the non-linear pricing of internet stocks", *In*: Hand, J.R.M. and Lev, B. (eds.), Intangible Assets: Values, Measures, and Risks, Oxford, UK: Oxford University Press.

Hand, J.R.M., 2004, "The market valuation of biotechnology firms and biotechnology R&D", In: J. McCahery and Renneboog, L. (eds.), Venture Capital Contracting and the Valuation of High-Technology Firms, Oxford, UK: Oxford University Press.

Hand, J.R.M., 2005, "The value relevance of financial statements in the venture capital market", Accounting Review 80 (2), 613-648.

Haour, G., 2005, "Israel, a powerhouse for networked entrepreneurship", International Journal of Entrepreneurship and Innovation Management 5 (1,2), 39-68.

Hayn, C.. 1995, "The information content of losses", Journal of Accounting and Economics 20, 125-153.

Hering, T., M. Olbrich, and M. Steinrucke, 2006, "Valuation of start-up internet companies", International Journal of Technology Management 33 (4), 406.

Hirschey, M., V.J. Richardson, and S.W. Scholz, 2001, "Value relevance of non-financial information: The case of patent data", Review of Quantitative Finance and Accounting 17 (3), 223-235.

Jorion, P., and E. Talmor, 2001, Value Relevance of Financial and Nonfinancial Information in Emerging Industries: The Changing Role of Web Traffic Data, London Business School Accounting Subject Area, No. 021.

Lev, B., and T. Sougiannis, 1996, "The capitalization, amortization, and value-relevance of R&D", Journal of Accounting and Economics 21, 107-138.

Lev, B., and P. Zarowin, 1999, "The boundaries of financial reporting and how to extend them", Journal of Accounting Research 37, 353-385.

Moore, G.A., 1999, Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers, New York: Harper Collins Publishers.

Myers, S.C., 1977, "Determinants of Corporate Borrowings", Journal of Financial Economics 5, 147-175.

OECD, 2003, "Venture capital policy reviews," STI Working Paper 2003/1, Industry Issues.

Ohlson, J.A., 1995, "Earnings, book value and dividends in security valuation", Contemporary Accounting Research 11, 661-687.

Rajgopal, S., T. Shevlin, and M. Venkatachalam, 2003, "Does the stock market fully appreciate the implications of leading indicators for future earnings? Evidence from order backlog", Review of Accounting Studies 8, 461-492.

Schwartz, D., and R. Bar-El, 2007, "Venture investments in Israel – A regional perspective," European Planning Studies 15 (5), 623-644.

Shortridge, R., 2000, "Measuring R&D success: A study of new drug approvals in the pharmaceutical industry," Ball State University, Working Paper.

Trueman, B., F. Wong, and X. Zhang, 2001, "Back to basics: Forecasting the revenues of internet firms", Review of Accounting Studies 6, 305-329.

White, H., 1980, "A heteroskedasticity-consistent covariance matrix rstimator and a direct test for heteroskedasticity", Econometrica 48, 817-838.

Zhang, X-J. 2001, "Accounting conservatism and the analysis of line items in earnings forecasting and equity valuation", Berkeley: University of California, Working Paper.

The Journal of Entrepreneurial Finance Volume 13, Issue 2, Fall 2009 1-24

ISSN: 1551-9570