

The history and performance of concept stocks

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Abstract

This study investigates the performance of firms with extremely high levels of market to sales value (“concept stocks”). To many observers, these stocks appear overvalued. However, proponents argue that because of their unique characteristics, traditional pricing models fail to value these firms correctly. Ex post, the debate can be resolved through an analysis of the long-term performance of concept stocks. En route to testing the implied overpricing hypothesis we document several important findings. First, the identity and characteristics of concept stocks have changed markedly over time. Although the obvious recent examples are internet and biotech stocks, concept stocks vary widely by industry over the past four decades. The industries containing the most popular concept stocks evolve from oil and gas extraction in the 1960s and 1970s, to computer and office equipment in the 1980s, and to computer-related services in the 1990s. Second, although concept stocks tend to be young, small, growth stocks in the 1990s, they exhibit a wide range of characteristics throughout the sample period. Third, the relative pricing of concept stocks (compared to either a control sample or the entire population) has changed dramatically over time. The average concept stock sold for approximately three times sales in the late 1960s and 1970s, five times sales in the 1980s and nearly 17 times sales in the 1990s. Finally, we find evidence supporting the overpricing hypothesis. Concept stocks under-perform significantly in the long run. This under-performance is more severe for Nasdaq firms and in the most recent two decades. The results are separate from glamour, IPO, industry, or contrarian effects and remain after an extensive sensitivity analysis.

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1. Introduction

*You could tell it was a concept stock because the financials were so bad . . . The market capitalization was out of proportion to everything but management's promises.*¹

Concept stocks are generally defined as stocks with extremely high market to sales ratios. The term “concept” relates to the suggestion that investors need to buy into the concept or idea of a company to understand what would otherwise appear to be a high valuation.² The most obvious recent examples are Internet and biotechnology stocks.³ Concept stocks, however, are not new to the economy. Indeed, the quote above was written over a decade ago about Fuddruckers, a hamburger chain! In spite of their frequent mention in the financial press, we know little about the industry distribution, firm characteristics, and long run performance of concept stocks. At the first glance, one might expect that concept stocks are primarily young, small, growth stocks. Empirical examination, however, indicates that this is not the case. In Sections 2 and 3 we show that only 50% of concept stocks are considered growth stocks and that they distribute almost evenly in each size decile. Although concept stocks do exhibit significantly higher R&D expenditures, they are otherwise more heterogeneous in terms of characteristics than is typically suggested.

To some observers, the prices of concept stocks are far beyond any reasonable relation to the expectation of future earnings or cash flows. In fact, the companies represented by concept stocks often have little or no positive earnings to evaluate. Concept stocks are typically defined by the ratio of market to sales for the specific reason that metrics such as the price–earnings ratios are meaningless for companies with negative earnings.

Proponents of these stocks argue that you must buy the “concept” in order to understand their valuation. The concept typically relates to unforeseen future earnings that would justify the current price.⁴ One justification is that because of unusually high levels of R&D, advertising or capital expenditures, these firms are difficult to value but have the potential for dramatically higher future returns. Lev and Sougiannis (1996) find a positive relationship between R&D and subsequent stock returns. Their results are interpreted as either a rational compensation for risks unidentified by existing asset-pricing models or a systematic mis-pricing for firms with more intangible assets. On the other hand, Chan et al. (2001) show that there is no direct link between investments in R&D and future stock returns. Firms with high R&D earn an average return similar to those without R&D. A recent study by Titman et al. (2004) provides evidence that firms with high capital expenditures earn lower benchmark-adjusted stock returns, a result primarily driven by the over-investment problem. Obviously, the evidence is mixed.

¹ Frederick E. Rowe Jr., “Don’t Get Mad, Go Short.” *Forbes*, June 25, 1990.

² For example, John C. Boggle Jr. President of Boggle Investment Management, states: “the more overpriced a stock is, the more overpriced it can become. There is no sensible metric for valuing” concept stocks. See: “If ‘concept stocks’ are stuff dreams are made on, does a rude awakening loom?” *Heard on the Street*, Wall Street Journal, February 17, 2000.

³ A partial list of the literature examining the pricing of Internet stocks includes Cooper et al. (2001), Trueman et al. (2000), Demers and Lev (2001), Cornell and Liu (2001), Hand (2000) and Ofek and Richardson (2003).

⁴ A variation is that traditional methods, or the parameters used in these methods are inappropriate. For example, it has been argued that the risk premium utilized to discount expected cash flows from technology stocks is too high.

Disagreements over the valuation of concept stocks can be resolved by examining future performance. Two hypotheses are implied. The first is that the pricing of concept stocks accurately reflects the dynamics of their economic fundamentals. Apparent mispricings are instead rational compensation for risks unidentified by existing pricing models (e.g. Fama and French, 1993).⁵

The second hypothesis is that concept stocks represent fads in market pricing. That is, for particular reasons, certain stocks receive valuations that are out of proportion with the rest of the market. Some investors tend to get overly excited about owning those “trendy” stocks *regardless of* their past performance. La Porta et al. (1997), for example, argue for behavioral explanations. Shiller (1999) cites “Irrational Exuberance.” Along these lines, investors overprice securities because they inappropriately extrapolate high growth rates or underestimate the riskiness of a stock.⁶ Under the fad or behavioral interpretation, the subsequent performance of concept stocks is predicted to be dismal.

The question, “Are concept stocks overvalued?” is an empirical one, tested by examining operating and stock performance in the long run. We define concept stocks as stocks in the *extreme* decile ranked by the market to sales ratio. Unlike asset-pricing tests using variables like book-to-market or firm size, we are not inherently interested in the market to sales ratio itself. We use this ratio merely as a tool, enabling us to empirically identify concept stocks. Our objective is a detailed analysis of the characteristics of concept stocks and a thorough test of the pricing (or mis-pricing) of these stocks rather than a cross-sectional analysis of the predictability of future stock returns implied by the entire range of a particular ratio.⁷

In the process of testing these hypotheses we document several noteworthy results. First, the types of firms identified as concept stocks have changed dramatically over the past three decades. This is true of their industrial composition as well as their financial characteristics. We find that a typical concept stock is larger in terms of market value, younger and less profitable than a comparable control firm. In addition, the specific characteristics of concept firms have varied considerably over time.

Second, the relative valuation of a typical concept stock has increased sharply over time. The typical concept stock sells for three times sales in the late 1960s and 1970s, five times sales in the 1980s, nearly 17 times sales in the 1990s and 45 times sales by the last year in our sample, 1999. A typical control firm sells for 1.2 times sales at the beginning of our sample period and only 1.36 times sales at the end. Third, while more than 95% of concept stocks have positive earnings near the beginning of our sample, less than 40% have positive earnings near the end of our sample. In terms of market value, concept stocks tend to be larger than average CRSP firms. Concept firms, however, are significantly smaller than the typical CRSP or matched firms in terms of book value. Fourth, the long run performance of concept stocks is negative relative to control firms. This result holds no matter whether measured by Fama and French (1993) factors or buy-and-hold returns. Further analysis shows that the under-performance of concept stocks is more severe for Nasdaq firms and during the recent two decades. Fifth, consistent with street wisdom, concept stocks have higher levels of research and development and greater capital

⁵ Other related literature includes Dreman and Berry (1995) who examine price earnings ratios and investor overreaction.

⁶ See Hirshleifer (2001) for an extensive review of psychology and asset pricing.

⁷ Several studies (for example, Liao and Chou, 1995; Barbee et al., 1996; O’Shaughnessy, 1998) investigate the cross-sectional predictability of equity returns based on the market to sales ratio.

expenditures than comparison firms. Our study indicates that although concept stocks are R&D-intensive firms, they are less profitable than an average firm. However, in contrast to the high R&D firms examined in Titman et al. (2004), the under-performance in our study is unlikely to be driven by the over-investment problem associated with a higher level of free cash flows. This is because concept firms usually do not have positive cash flows. Interestingly, when we use financial and other firm-specific variables to explain the under-performance of concept stocks, we find that firms with high R&D expenditures perform better than those with lower R&D expenses. Finally, after controlling for the glamour, contrarian, or equity issuance effects, the under-performance of concept stocks is still significant; the concept effect is not a metaphor for those effects.⁸

Because so little is documented about concept stocks we begin with a descriptive analysis of concept stocks followed by a formal test of the overpricing hypothesis. Section 2 describes the data and the sample selection procedure. The identity and financial characteristics of concept stocks are discussed in Section 3. Section 4 examines the overpricing hypothesis, testing the relative performance of concept stocks in terms of both accounting and rates of return. Section 5 concludes.

2. Sample selection

2.1. Defining concept stocks

As with the “value vs. glamour” and contrarian literature, we need a simple objective criterion to identify concept stocks over time. To understand how markets describe concept stocks, we search Dow Jones News Retrieval for relevant new articles over the past 33 years (1967–1999). In particular, we identify all articles mentioning the word “concept(s)” where “stock(s) was within five words”. More than 350 articles were found.⁹ It is apparent that the market’s interest in concept stocks is not just a recent phenomenon. Moreover, the concepts, companies and industries identified in these articles are diverse and changing over time. The specific concepts identified by these articles include discussions of “exciting business ideas” such as “improved management of doctors by doctors” or “the warehousing notion”. Some articles cite buying patterns: “baby boomers with money to invest purchasing the stocks they knew as children.” Other articles cite “inherent quality” or “under-valuation” or “long-term inflation hedges.” Most articles appear skeptical of concept stocks. In a classic rebuke of concept stocks, David Dremen notes in *Forbes* that “Netscape is trading at a P/E of 375 and America Online at 41. One is discounting the hereafter, the other is discounting eternity.”¹⁰

These articles frequently describe concept stocks as those with extreme market to sales ratios. Rather than focus on an ad hoc set of newsworthy stocks, we define concept stocks

⁸ One possible explanation for our results comes from a recent theoretical model by Daniel et al. (2001). In their model, some investors are overconfident about their abilities to interpret the quality of information they have about the values of securities. The implication from investor overconfidence is that the stocks traded by those informed, overconfident individuals eventually under-perform in the long run. In addition, the problem of investor mis-valuation could be more severe for firms with fewer tangible assets. Concept stocks are ideal candidates to suffer from such mis-valuation since they tend to be younger and more R&D-intensive than other firms in the market.

⁹ The detailed search process and summary of the key quotes from the search are available upon request from the authors.

¹⁰ David Dremen, “Hot spots in a cool market”, *Forbes*, January 1, 1996.

using this objective ratio. An alternate measure, like price to earnings, fails because it does not recognize firms with negative earnings. The market to sales ratio also differs from the market to book ratio (used in the “value vs. glamour” literature) in that its numerator is an active flow measure, rather than a static, historical variable. The book value of equity used in market to book ratios is also affected by accounting methods such as depreciation and inventory.

To identify concept stocks, we begin with the intersection of all non-financial firms listed on the CRSP monthly return files and the merged Compustat annual industrial files for each of the years 1965–1999. To ensure that the accounting variables are known before the return variables, we match the accounting data for all firms which have fiscal year-ends in months January–May in calendar year $t - 1$ with their returns in calendar year t . We further delete the firms with average stock prices less than \$5 during the selection year to avoid micro structure or liquidity concerns. This also avoids the problem of extreme outliers created by very low stock prices. Results including these stocks (available upon request) are similar. For remaining firms we calculate the ratio of sales to the market value of equity at the calendar year-end. Concept stocks are defined as firms in the highest market to sales decile at the end of the each calendar year. Thus, they comprise the 91st through 100th percentile of firms ranked in order of the market to sales ratio and redefined each year. We choose this definition to create a consistent, objective definition of concept stocks.¹¹ Nevertheless, we find that our sample matches well with concept stocks subjectively identified by various authors in the financial press. Of the 88 firms subjectively identified as concept stocks, 73 are listed in the CRSP/Compustat universe. We find that 74% of these firms are included in our sample. Over the earlier years (1973–1990), we find 63% (19 of 30) in our sample. Over the last decade, 81% (35 of 43) of concept stocks identified in the financial press appear in our sample.

2.2. *The relationship between concept stocks and glamour/small stocks*

One might expect that our methodology selects firms that overlap with a sample based on book-to-market and/or size. The latter sample has been studied extensively in the size/value/glamour literature including analyses by Banz (1981), Fama and French (1993) and La Porta et al. (1997), among others. We check for the magnitude and impact of any overlap in several ways. First, the correlation between market to book and market to sales is a low 0.07 for the sample we will identify as concept stocks.

Second, following the standard procedure performed in numerous studies in the literature, we sort stocks into deciles each year using all sample firms with positive book equity. The sorting variable is either size or book-to-market. We then calculate the fraction of concept stocks in each of the deciles. The unreported result shows that the percentage

¹¹ Our operational definition of concept stocks requires an objective selection criterion. We choose the sales to market ratio, noting the high correlation between the subjectively identified concept stocks and our sample. To the extent that we mis-classify firms as concept stocks, we bias against finding significant results. There is one exception to this statement: since our classification procedure is based on the sales to market ratio our results could really be describing the behavior of these firms. A complete analysis of this issue would require an examination of all deciles of sales to market ratios, not just the highest. Nevertheless, as shown in Table 10, we do not find a significant difference in the performance of our sample of concept stocks ranked by terciles according to the level of their sales to market ratio.

of concept stocks falling into the smallest book-to-market decile ranges from 36% to 69% with an average of 50%. Thus, concept stocks that could be classified as glamour stocks comprise about half of our sample. To separate the “concept effect” from the glamour effect, we use control firms matched by size and book-to-market. To the extent that these matched firms have similar characteristics as glamour stocks, they provide a natural control. In addition we control for glamour effects directly in our multivariate analyses. Our results for concept stocks are robust to these controls for glamour effects.

A related concern is whether our concept firms are likely to be small firms. If this is the case, then we are picking up the (small-) size effect. We repeat a similar exercise as above and find that the percentage in the smallest size decile ranges from 0.71% to 11% with an average of 6%. Interestingly, concept stocks fall into each size decile quite evenly. Thus, concept stocks do not necessarily represent small firms. We further examine the percentage of concept stocks in two-dimensional portfolios formed by both size and the book-to-market ratio. The result (not reported) shows that the fraction of concept stocks in the smallest size/book-to-market portfolio is only 2%. Thus, our sample of concept stocks does not show strong overlap with those identified as small-growth stocks.¹² Nevertheless, we will continue to control for this in our multivariate analyses.

2.3. Defining the control sample

For the first part of our analysis we use a set of control firms matched on size and the book-to-market ratio. This matching-firm technique is suggested by Barber and Lyon (1997) and implemented in numerous studies such as Loughran and Ritter (2000), Brav et al. (2000), Eckbo et al. (2000) and Eckbo and Norli (2001). Specifically, we select control firms using the following procedure: for each concept stock, select all firms with equity market values within 30% of the concept stock. If the initial subset contains fewer than five candidate firms, we expand the range of equity market value to be within 40% of the concept stock. We also delete potential control firms that are themselves concept stocks in the previous 2 years to increase independence in statistical tests and also to avoid the benchmark bias discussed in Loughran and Ritter (2000). The firm with the closest book-to-market ratio among the remaining firms is chosen as its control firm. Since the matching characteristics utilized to identify control firms (initially, size and market to book) are of interest themselves; it is also useful to have an alternate benchmark. Consequently, we also show results for the set of all CRSP/Compustat firms with stock price exceeding \$5 (which includes concept stocks). Except where specified, differences between concept and control firms also hold between concept and all firms. In subsequent sections we also perform extensive sensitivity tests examining alternate control groups by using other firm characteristics such as industry, cash flows and firm age.

2.4. The time series of market to sales ratios

Panel A of Table 1 reveals the market to sales ratio for concept stocks, control firms and all firms over the 33 years of our sample. As noted by the sample size in the far right

¹² To ensure that our results are not driven by the size or BV/MV effects, we later perform a robustness check on this issue.

Table 1

The market-to-sales ratio of the sample over time, 1967–1999

Year	Concept stocks		Control firms		All firms		N
	Mean	Median	Mean	Median	Mean	Median	
Panel A: Distribution by year							
1967	5.447	5.498	1.218	1.607	0.606	0.915	1324
1968	5.889	5.701	1.336	1.664	0.762	1.054	1483
1969	4.221	4.063	0.979	1.234	0.445	0.655	1574
1970	3.222	3.013	0.780	1.130	0.363	0.552	1553
1971	3.864	3.672	0.811	1.237	0.410	0.634	1619
1972	3.976	4.019	0.985	1.436	0.361	0.575	1688
1973	2.993	3.200	0.687	0.985	0.197	0.298	1464
1974	1.622	1.588	0.332	0.579	0.139	0.198	1236
1975	1.925	1.917	0.377	0.620	0.210	0.304	1282
1976	1.952	1.970	0.388	0.643	0.245	0.358	1445
1977	1.713	1.677	0.411	0.554	0.240	0.358	1425
1978	1.717	1.618	0.414	0.533	0.223	0.318	1437
1979	2.162	2.087	0.580	0.675	0.237	0.353	1379
1980	2.990	3.067	0.562	1.051	0.266	0.401	1365
1981	2.350	2.229	0.534	0.889	0.253	0.383	1403
1982	4.995	5.192	0.445	0.774	0.349	0.562	2220
1983	7.092	7.168	0.512	0.850	0.462	0.759	2668
1984	4.382	4.125	0.561	0.888	0.391	0.605	2504
1985	5.089	4.883	0.812	1.385	0.477	0.736	2367
1986	6.165	5.672	0.823	1.265	0.501	0.757	2438
1987	5.402	5.003	0.599	0.911	0.385	0.634	2439
1988	4.780	4.386	0.518	0.820	0.439	0.660	2083
1989	5.583	5.084	0.896	1.230	0.443	0.722	2000
1990	5.107	4.671	0.896	1.218	0.343	0.595	1843
1991	12.690	13.477	0.922	1.574	0.495	0.906	2036
1992	13.514	15.221	0.933	1.282	0.570	1.008	2340
1993	15.723	15.723	0.988	1.533	0.656	1.078	2725
1994	9.690	8.945	0.936	1.555	0.581	0.976	2878
1995	14.514	13.966	1.194	2.128	0.588	1.139	3067
1996	21.142	21.368	1.191	1.868	0.679	1.320	3526
1997	16.611	16.313	1.117	1.564	0.725	1.336	3520
1998	14.903	14.993	1.409	2.256	0.578	1.046	3170
1999	45.249	48.077	1.365	4.346	0.546	1.290	2942
1967–1999	7.839	4.883	0.803	1.230	0.429	0.655	68,443
Diff			7.035	3.653	7.409	4.227	
(p-value)			(0.000)	(0.000)	(0.000)	(0.000)	
Panel B: Distribution by subperiod							
Period							
1967–1972	4.436	4.041	1.018	1.337	0.491	0.645	9241
1973–1981	2.158	1.970	0.476	0.643	0.223	0.353	12,436
1982–1987	5.521	5.097	0.625	0.899	0.428	0.685	14,636
1988–1993	9.566	9.280	0.859	1.256	0.491	0.814	13,027
1994–1999	20.351	15.653	1.202	1.998	0.616	1.214	19,103

(continued on next page)

Table 1 (continued)

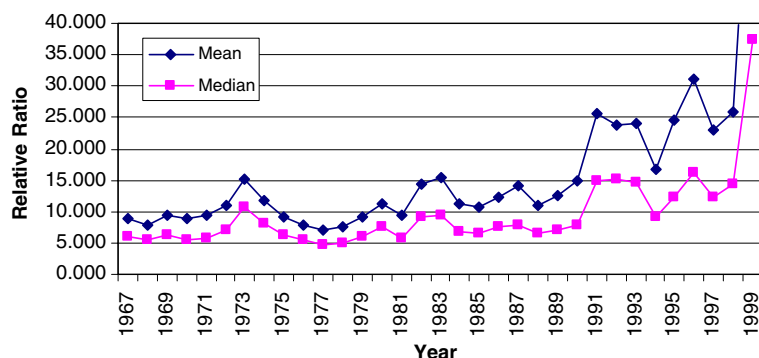
Period	Concept stocks		Control firms		All firms		N
	Mean	Median	Mean	Median	Mean	Median	
1967–1999	7.839	4.883	0.803	1.230	0.429	0.655	68,443
Diff			7.035	3.653	7.409	4.227	
(<i>p</i> -value)			(0.000)	(0.000)	(0.000)	(0.000)	

We report time-series trends of the ratio of equity market value to sales (MV/Sales) for our sample, concept stocks and control firms. The sample universe consists of all non-financial firms in the intersection of CRSP monthly return files and the merged Compustat annual industrial files from 1965 to 1999. Firms with stock prices less than five dollars are deleted. Concept stocks are defined as the firms in the 91st to 100th percentile of market-to-sales ratio each year. The equity market value is the market capitalization of common stock at calendar year-end. Book values and market values not used in ratios are deflated using the CPI into 1998 dollars. *N* is the number of non-missing firms in CRSP each year. Control firms are chosen using a two-way matching procedure involving size and the book-to-market ratio. First, we identify the subset of matching candidates that have market values within 30% of a concept stock and are not concept stocks themselves in the previous 2 years. From this subset, the firm with the closest book-to-market ratio is chosen as the control firm. If the subset contains fewer than five candidate firms, we expand the range of market value to be within 40%. “Diff” under Control firms calculates the average/median difference of mean/median between concept stocks and control firms each year, and “Diff” under All firms calculates the average/median difference of mean/median between concept stocks and all firms in the sample. *p*-Values under Mean are associated with robust *t*-statistic using a two-sided *t*-test of no difference in the mean each year. *p*-Values under Median are associated with Wilcoxon signed rank test of no difference in median each year.

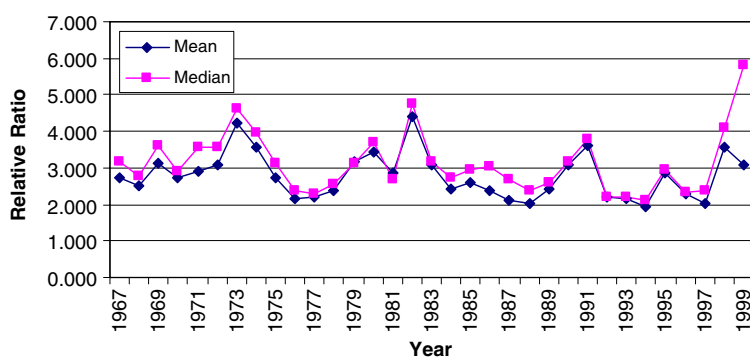
column, approximately 1300–3500 firms per year comprise the intersection of CRSP and Compustat firms from which concept and control firms are selected. In general, the total number of firms increases over time. Particularly notable is the dramatic increase between 1981 and 1982. This is because of the addition of newly-listed Nasdaq firms to the CRSP database. Fama and French (2001) also document this increase. Further, since CRSP did not include Nasdaq firms until late 1972, we are careful to separate the early pre-NASDAQ period (1967–1972).

Fig. 1a displays the time-series pattern of market-to-sales ratio for concept stocks relative to the ratio for all firms from the CRSP/Compustat intersection. Several observations are apparent from Table 1 and graphs. First, the difference between mean and median values of concept stocks and control firms has increased dramatically over the years. The average concept stock sold for approximately three times sales in the late 1960s and 1970s, five times sales in the 1980s and nearly 17 times sales in the 1990s. The data reveal two distinct plateaus of differences. The market-to-sales ratio for concept stocks is substantially higher during the 1980’s than during the previous decades. The ratio has experienced even higher, albeit erratic levels during the 1990’s, rising to a high of 45.2 in 1999. These trends are apparent in both the means and medians. In comparison, Fig. 1b displays the relatively stable ratio of market-to-book for concept stocks and all firms over the sample period. Thus, compared to the CRSP universe, concept stocks have increasing market-to-sales ratios over our sample period, but their market-to-book ratio remains stable.

We note that the dramatic shift in the ratio after 1981 is not driven by: (a) a dramatic increase in the level of the stock market or (b) a dramatic shift in the exchange listing composition of concept stocks. This result is consistent with the findings of Fama and French



(a) MV/Sales of concept stocks relative to the whole sample



(b) MB/BV of concept stocks relative to the whole sample

Fig. 1. The relative ratios of concept stocks to all firms, 1967–1999. Plots of the market-to-sales and market-to-book ratios for concept stocks relative to all firms reported in both Compustat and CRSP. Concept stocks are defined as the firms in the 1st to 10th percentile of sales-to-market ratio each year. The equity market value is the market capitalization of common stock at calendar year-end. Book values and market values not used in ratios are deflated using the CPI into 1998 dollars.

(2001) who report a dramatic decline after 1978 in the percentage of firms paying dividends. They attribute this result to “an increasing tilt of publicly traded firms toward . . . low earnings, strong investments, and small size.” With the exception of size (in market value) these are characteristics of concept stocks.

In the remainder of the paper, we condense our sample into 6–9-year subperiods for ease of exposition.¹³ Subperiods are organized to recognize the first years without Nasdaq (1967–1972), the second period prior to the dramatic shift in the market to sales ratios (1973–1981) and three remaining and equal subperiods. Panel B of Table 1 displays the means and medians of the market to sales ratios for these subperiods.

¹³ Results on a yearly basis are available upon request.

3. Characteristics of concept stocks

3.1. Size, age and financial characteristics

Table 2 reveals the size, age, and financial characteristics of concept and control stocks over the subperiods of our sample. Note that while we report both means and medians, we view the latter as more informative; mean values are more likely to be distorted by extreme values. In addition, we note that the set of all firms also includes all concept stocks and is thus biased toward acceptance of the null hypothesis of no difference between concept and control stocks. Nevertheless, all of the variables analyzed show significant differences for concept stocks either at the mean or median.¹⁴ For most variables, both mean and median are significantly different.

Panel A of Table 2 indicates that concept firms are significantly larger in market value than the associated control firms. However, this result is driven by the sample characteristics before 1981. In this period, concept stocks are significantly larger than average CRSP firms. Analysis of book value, however, reveals that mean and median book values are significantly smaller for concept stocks in all of the subperiods analyzed. Since book-to-market ratios are used in the identification of the control sample, this explains why the book-to-market ratios for control firms are lower than that for the sample of all firms. Nevertheless, we find that the book-to-market ratio of concept stocks is significantly lower than that of control firms and the entire sample. Moreover, while even the median book-to-market ratios exhibit considerable variation over the five subperiods, the values for concept stocks are always lower.

Panel B.1 reveals the age distribution of concept stocks. Approximately 18% of the concept stocks are IPOs, defined here as any firm listed less than a year on the CRSP tapes. Nearly 61% of concept stocks have been listed 5 years or less. More than 20% of our concept stocks, however, have been listed longer than 10 years; the oldest concept stock has been listed over 69 years! Panel B.2 reveals the average age across the subperiods for concept and control stocks. The age of concept stocks in terms of years listed on CRSP reveals that they are typically 4–7 years younger than control firms. It is also evident that the mean and median ages of concept stocks are higher in the first two subperiods of our sample; the average age of concept stocks is decreasing over time. This is consistent with the influx of new listings mentioned in Fama and French (2001). Panel B.3 shows the percentage of concept stocks that are IPOs in each subperiod. Over the entire sample period, 17.62% of our concept stocks are IPOs. For the subperiods, the average percentage of concept stocks that are IPOs ranges from 1.6% to 27.35%. Thus, while the ages of concept stocks are generally young, less than 20% are IPOs. The annual pattern (not reported) shows that, before 1990, the percentage of IPO concept stocks is higher than 20% in only two out of 24 years. However, after 1990, the percentage has increased to higher than 20% in almost every year. It ranges from 16% (in 1998) to 37% (in 1999) with an average of 27% during the post-1990 period. In our analysis of abnormal performance, we will be careful to control for any IPO effect.

¹⁴ In our measure of statistical significance, White corrected *t*-statistics are used throughout the paper to take into account the possibility of correlation among observations.

Table 2
Characteristics of concept stocks, 1967–1999

Period	Market value			Firm (book) size			Book-to-market ratio			All firms		
	Concept	Mean	Median	Concept	Mean	Median	Concept	Mean	Median	Concept	Mean	Median
<i>Panel A: Size and book-to-market ratio</i>												
1967–1972	6,356	6,410	6,306	5,534	5,347	5,135	5,135	5,445	5,360	5,300	5,153	0.258
1973–1981	6,474	6,400	6,388	5,606	5,472	5,865	5,809	6,152	5,929	5,858	5,736	0.438
1982–1987	4,920	4,883	4,873	5,248	5,035	3,633	3,626	4,370	4,196	5,087	4,894	0.265
1988–1993	5,467	5,335	5,337	5,564	5,369	4,101	4,057	4,707	4,722	5,285	5,151	0.276
1994–1999	5,763	5,384	5,353	5,775	5,559	4,085	3,831	4,679	4,319	5,291	5,024	0.214
1967–1999	5,858	5,73	5,75	5,55	5,38	4,68	4,32	5,17	4,80	5,41	5,17	0.30
Diff		0.02	0.02	0.10	0.15			–0.57	–0.37	–0.97	–0.90	0.23
(p-value)		(0.00)	(0.02)	(0.01)	(0.01)			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age	0	1	2	3	4	5	6	7	8	9	10	11–20
Count	1196	969	663	476	393	356	330	264	222	176	145	969
Percent	17.88	14.49	9.91	7.12	5.88	5.32	4.93	3.95	3.32	2.63	2.17	14.49
Cumulative %	17.88	32.37	42.28	49.40	55.28	60.60	65.54	69.48	72.80	75.43	77.60	92.09
<i>Panel B: Age distribution of concept stocks (Year 1972 excluded)</i>												
Period	Concept			Control			All firms			All firms		
	Mean	Median	Diff	Mean	Median	Diff	Mean	Median	Diff	Mean	Median	Diff
1967–1972	10,376	7,000	3,376	15,414	7,000	8,414	15,414	7,000	8,414	14,047	7,000	7,047
1973–1981	15,285	12,000	3,285	20,072	12,000	8,072	20,072	13,000	7,072	19,009	13,000	6,009
1982–1987	5,272	2,000	3,272	12,954	2,000	10,954	12,954	12,500	4,454	14,724	12,500	2,224
1988–1993	6,359	3,000	3,359	13,597	3,000	10,597	13,597	9,500	4,097	14,793	11,500	3,293
1994–1999	3,639	2,000	1,639	13,142	2,000	11,142	13,142	8,500	4,642	12,310	6,000	6,310
1967–1999	8.8	4.0	4.8	15.5	4.0	11.5	15.5	10.0	5.5	15.3	11.0	4.3
Diff				–7.63		–7.63	–7.63	–4.00	–4.00	–7.59	–5.00	–2.59
(p-value)				(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
<i>Panel B.3: Percentage of concept stocks that are IPO firms, by subperiod</i>												
Period	# IPOs			# Concepts			Percentage					
1967–1972	94	20	74	927	1248	321	10.14	10.14	10.14	10.14	10.14	10.14
1973–1981	303	268	35	1465	1305	160	1.60	1.60	1.60	1.60	1.60	1.60
1982–1987	523	1208	685	1912	6857	4945	20.68	20.68	20.68	20.68	20.68	20.68
1988–1993	523	1208	685	1912	6857	4945	20.54	20.54	20.54	20.54	20.54	20.54
1994–1999	523	1208	685	1912	6857	4945	27.35	27.35	27.35	27.35	27.35	27.35
1967–1999	1208	6857	5649	6857	17,62	16,413	17.62	17.62	17.62	17.62	17.62	17.62

(continued on next page)

Table 2 (continued)

Period	Long-term debt ratio						R&D/Sales						Adv/Sales						Capex/Sales					
	Concept			Control			Concept			All firms			Concept			All firms			Concept			Control		
	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean
<i>Panels C, Debt, R&D, advertising and capital expenditures</i>																								
1967–1972	0.08	0.03	0.13	0.09	0.23	0.02	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.07	0.05	0.04
1973–1981	0.12	0.08	0.19	0.16	0.34	0.31	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.27	0.11	0.06	0.05
1982–1987	0.05	0.01	0.17	0.12	0.23	0.19	0.24	0.06	0.02	0.00	0.04	0.00	0.02	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.29	0.12	0.06	0.03
1988–1993	0.04	0.01	0.14	0.06	0.21	0.16	0.54	0.11	0.03	0.00	0.08	0.00	0.02	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.34	0.13	0.05	0.05
1994–1999	0.03	0.00	0.11	0.03	0.17	0.09	0.80	0.34	0.07	0.01	0.12	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.39	0.17	0.06	0.04
1967–1999	0.07	0.02	0.15	0.10	0.25	0.20	29.61%	4.00%	2.54%	0.00%	4.79%	0.00%	1.39%	0.00%	1.90%	0.003%	0.001%	1.02%	0.001%	29.4%	12.0%	5.7%	3.8%	4.6%
Diff	–0.09	–0.06	–0.19	–0.19	–0.19	–0.19	0.16	0.04	0.15	0.04	0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.09	0.18	0.07
(<i>p</i> -value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
<i>Panels D, Profit margin</i>																								
Period	Operating margin						ROA						ROA						Profit margin					
	Concept			Control			Concept			All firms			Concept			All firms			Concept			Control		
	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean
1967–1972	0.30	0.26	0.12	0.12	0.14	0.12	0.10	0.12	0.10	0.09	0.09	0.08	0.06	0.07	0.07	0.05	0.13	0.13	0.13	0.04	0.04	0.05	0.05	0.04
1973–1981	0.33	0.28	0.13	0.13	0.14	0.12	0.11	0.11	0.11	0.11	0.09	0.09	0.07	0.07	0.07	0.05	0.15	0.13	0.13	0.06	0.05	0.06	0.05	0.05
1982–1987	–0.18	0.17	0.12	0.12	0.09	0.11	–0.01	0.05	0.05	0.05	0.07	0.08	0.04	0.04	0.05	0.04	–0.28	0.10	0.10	0.04	0.04	0.05	0.01	0.04
1988–1993	–0.65	0.12	0.13	0.13	0.05	0.11	–0.07	0.03	0.03	0.07	0.09	0.07	0.09	0.04	0.05	0.05	–0.82	0.06	0.06	0.04	0.04	0.05	–0.05	0.04
1994–1999	–1.24	–0.57	0.12	0.12	–0.03	0.12	–0.23	–0.15	0.04	0.07	0.01	0.05	0.05	0.01	0.05	0.05	–1.44	–0.69	–0.69	0.02	0.05	0.05	–0.14	0.04
1967–1999	–0.23	0.23	0.12	0.12	0.09	0.12	–0.01	0.09	0.09	0.07	0.08	0.07	0.05	0.05	0.06	0.03	–0.40	0.11	0.11	0.04	0.04	0.05	–0.01	0.04
Diff	–0.59	0.10	–0.53	0.11	–0.53	0.11	–0.12	–0.01	0.03	–0.09	0.03	–0.12	–0.01	–0.09	0.03	0.03	–0.40	0.11	0.11	–0.67	0.07	0.07	–0.60	0.07
(<i>p</i> -value)	(0.003)	(0.569)	(0.004)	(0.511)	(0.004)	(0.511)	(0.000)	(0.010)	(0.010)	(0.008)	(0.930)	(0.000)	(0.010)	(0.008)	(0.930)	(0.008)	(0.000)	(0.010)	(0.001)	(0.489)	(0.001)	(0.001)	(0.001)	(0.445)
<i>Panels E, Percentage of firms with positive earnings</i>																								
Period	Concept						Control						All						Percentage of firms with positive cash flows					
	Concept			Control			All firms			Concept			All firms			Concept			All firms			Concept		
	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean	Mean	Median	Mean
1967–1972	97.1	97.1	96.0	96.0	96.0	96.0	94.1	94.1	94.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	96.0	96.0	96.0	97.3
1973–1981	98.9	98.9	99.8	99.8	99.8	99.8	96.5	96.5	96.5	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	99.8	99.8	99.8	98.9
1982–1987	70.4	70.4	92.6	92.6	92.6	92.6	85.8	85.8	85.8	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	92.6	92.6	92.6	92.3
1988–1993	55.8	55.8	96.7	96.7	96.7	96.7	83.6	83.6	83.6	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8	96.7	96.7	96.7	92.3
1994–1999	35.5	35.5	90.2	90.2	90.2	90.2	77.1	77.1	77.1	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	86.5	86.5	86.5	86.5
1967–1999	74.0	74.0	95.5	95.5	95.5	95.5	88.2	88.2	88.2	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	95.5	95.5	95.5	93.9
Diff	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–18.5	–18.5	–18.5	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–28.1	–25.1
Mean	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Median	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–7.9	–7.9	–7.9	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–17.2	–14.2
(<i>p</i> -value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.005)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Descriptive statistics on key variables for our sample over time. We report the results based on the subperiods. Firm market value, in log (millions), is natural logarithm of the summation of the market capitalization of common stock at calendar year-end, debt in liabilities, long-term debt, and preferred stock. Book value is total assets minus total liabilities and preferred stock. Firm book size, in log (000s), is the natural logarithm of book value. Age is defined as the difference between year of interest and the earliest year that the firm has traded stock price available in CRSP. The long-term debt ratio is debt in current liabilities plus long-term debt divided by firm market value. Operating margin defined as operating income before depreciation divided by sales. Return on assets is defined as operating income before depreciation divided by assets. Profit margin is net income divided by sales. Net working capital ratio is total current assets minus current liabilities divided by assets. Cash flow is defined as operating income before depreciation. Book values and market values not used in ratios are deflated using the CPI into 1998 dollars. Control firms are chosen using a two-way matching procedure involving firm size and the book-to-market ratio. First, we identify the subset of matching candidates that have market values within 30% of a concept stock and are not concept stocks themselves in the previous 2 years. From this subset, the firm with the closest book-to-market ratio is chosen as the control firm. If the subset contains fewer than five candidate firms, we expand the range of market value to be within 40%. "Diff" under Control firms calculates the average/median difference of mean/median between concept stocks and control firms each year, and "Diff" under All firms calculates the average/median difference of mean/median between concept stocks and all firms in the sample. Panel B does not include the observations in 1972 when we calculate the age distribution of concept stocks due to the fact that CRSP started to include NASDAQ firms into the database in 1972. Therefore, firms with age zero in 1972 are not necessarily IPO firms. *p*-Values under Mean are associated with robust *t*-statistic using a two-sided *t*-test of no difference in the mean each year. *p*-Values under Median are associated with Wilcoxon signed rank test of no difference in median each year.

We note in Panel C that concept stocks tend to have less leverage relative to their control firms in all sample periods.¹⁵ On the other hand, concept stocks have significantly higher levels of research and development, advertising, and capital expenditures (all expressed as a ratio to sales). In the mid to late 1990s, the median level of R&D spending approaches 34% of sales.

In summary, the typical concept stock is smaller in terms of book value, younger, less levered, more research oriented, and spending proportionately more on advertising and capital expenditures than control firms. Testing whether these increased R&D and capital expenditures pay off over time will be inherent in our analysis of the long run performance of concept stocks.

3.2. *Concept stocks, profitability and positive cash flows*

Panel D of Table 2 reveals a shift over time in three profitability variables: operating margin, returns on assets, and net profit margin.¹⁶ Each of these variables experience declines in both absolute value and relative to the control firms except for the second subperiod. Thus, there is either an increasing tendency for the market to select unprofitable firms as concept stocks or an increasing proportion of CRSP firms that report negative earnings.

The percentage of concept stocks with positive earnings and cash flows, displayed in Panel E, has also declined markedly over the sample period both in absolute terms and relative to the control firms. While more than 95% of the concept stocks have positive earnings in the early 1970s, this number experienced a dramatic decline in the early 1980s and again in the 1990s. Interestingly, this corresponds with the dramatic increases in market to sales ratios previously noted. Our results are again consistent with Fama and French (2001) who also cite a dramatic increase in CRSP firms after 1978 and a sharp decline in profitability after 1982. The dramatic differences in financial ratios and other firm characteristics raise the question of the identity of the concept stocks. Do certain industries dominate concept stocks? Has the industrial composition changed over time? In how many years do individual stocks appear as concept stocks? The next several sections address these questions.

3.3. *Trading characteristics of concept stocks*

Panel A of Table 3 reports the frequency with which individual concept stocks appear across the 33 years of our sample. The vast majority (65.4%) of our firms appear just once or twice as concept stocks. One thousand ninety-five firms appear just once as concept stocks; 529 firms appear twice. A very small percentage of firms (3.6%) appear more than 10 times.¹⁷

¹⁵ The leverage ratio is defined as debt in current liabilities plus long-term debt normalized by firm market value.

¹⁶ Operating margin is defined as Operating income before depreciation (Compustat #13) divided by Sales (#12). Return on assets is Operating income before depreciation (#13)/Assets (#6). Net Profit margin is Net income (#172)/Sales (#12). Similar results, not shown here are obtained using Return on equity. ROE is Operating income before depreciation (#13)/(Total assets – Total liabilities (#6 – #181)).

¹⁷ Four firms appear 23, 24 (2 firms) and 26 times in our sample. These firms are Merck (Ticker symbol: MRK), Syntex (SYN), Homestake Mining (HM), and Callahan Mining (CMN), respectively. As the name suggests, Callahan and Homestake are mining companies. Callahan mines silver while Homestake concentrates on Gold. Merck and Syntex are typically described as research oriented pharmaceutical companies.

Table 3
Trading characteristics

Number of years	Number of firms					Percentage			Cumulative percentage		
<i>Panel A: Number of years firms are concept stocks</i>											
1	1095					44.08			44.08		
2	529					21.30			65.38		
3	287					11.55			76.93		
4	174					7.00			83.94		
5	91					3.66			87.60		
6	69					2.78			90.38		
7	62					2.50			92.87		
8	33					1.33			94.20		
9	31					1.25			95.45		
10	23					0.93			96.38		
11	14					0.56			96.94		
12	20					0.81			97.75		
13	12					0.48			98.23		
14	10					0.40			98.63		
15	8					0.32			98.95		
16	8					0.32			99.28		
17	3					0.12			99.40		
18	4					0.16			99.56		
19	2					0.08			99.64		
21	1					0.04			99.68		
22	4					0.16			99.84		
23	1					0.04			99.88		
24	2					0.08			99.96		
26	1					0.04			100.00		
Total	2484										
Period $t - 1$	Period t										
	10 (Concept)	9	8	7	6	5	4	3	2	1	
<i>Panel B: Stability of concept stocks</i>											
10 (Concept)	0.694	0.221	0.050	0.018	0.008	0.003	0.002	0.001	0.002	0.001	

9	0.115	0.459	0.269	0.090	0.040	0.015	0.008	0.003	0.002	0.001					
8	0.013	0.172	0.374	0.249	0.105	0.049	0.021	0.010	0.005	0.002					
7	0.003	0.042	0.181	0.334	0.238	0.116	0.054	0.020	0.010	0.003					
6	0.002	0.013	0.060	0.188	0.310	0.242	0.112	0.050	0.018	0.005					
5	0.001	0.004	0.023	0.071	0.194	0.303	0.248	0.109	0.038	0.008					
4	0.001	0.003	0.006	0.027	0.081	0.192	0.318	0.259	0.096	0.017					
3	0.001	0.001	0.003	0.010	0.026	0.081	0.206	0.357	0.259	0.056					
2	0.001	0.000	0.002	0.003	0.008	0.021	0.061	0.202	0.453	0.250					
1	0.000	0.000	0.000	0.001	0.002	0.002	0.011	0.038	0.185	0.760					
Period	Number of concept stocks			Percentage of concept stocks from various exchanges			Percentage of firms on an exchange that are concept stocks			Trading volume (turnover)					
										Concept		Control		All firms	
	NYSE	AMEX	NASDAQ	NYSE	AMEX	NASDAQ	NYSE	AMEX	NASDAQ	Mean	Median	Mean	Median	Mean	Median
Panel C: Exchanges and trading volume															
1967–1972	656	260	13	70.40	28.16	1.43	10.37	9.78	4.87	0.043	0.022	0.042	0.022	0.038	0.025
1973–1981	892	340	16	71.52	27.19	1.29	9.68	11.35	7.09	0.038	0.020	0.035	0.022	0.029	0.021
1982–1987	358	153	957	24.45	10.50	65.05	5.33	7.55	16.49	0.081	0.069	0.056	0.042	0.058	0.045
1988–1993	287	125	896	23.08	9.55	67.36	4.93	10.02	15.06	0.127	0.092	0.086	0.062	0.078	0.050
1994–1999	143	120	1653	7.53	6.31	86.16	2.06	9.45	15.00	0.230	0.165	0.151	0.103	0.128	0.087
1967–1999	2336	998	3535	42.32	17.33	40.35	6.77	9.79	11.28	0.098	0.074	0.070	0.051	0.063	0.043
Diff												0.014	0.016	0.019	0.013
(<i>p</i> -value)												(0.000)	(0.000)	(0.000)	(0.000)

Panel A reports the number of firms associated with the frequency of being selected as concept stocks in our sample period. For example, 1095 firms appear as concept stocks once during our sample period, 529 firms twice, . . . and so on. Panel B reports the probability of a stock moving between deciles from periods $t - 1$ to t . The sample universe consists of all nonfinancial firms in the intersection of CRSP monthly return files and the merged Compustat annual industrial files from 1965 to 1999. Firms with stock prices less than five dollars are deleted. Each year we sort all stocks in our sample universe and define concept stocks as the firms in the 91st to 100th percentile of market-to-sales ratio each year. The probability in Panel B is estimated as $p(i, j) = n(i, j)/n(i)$ where $n(i)$ is the number of firms in decile i at time $t - 1$ and $n(i, j)$ is the number of firms moving from decile i at time $t - 1$ to decile j at time t . Panel C reports the number of concept stocks based on exchanges. Trading volume (as average turnover) is defined as the annual average of monthly trading volume divided by shares outstanding for all concept stocks, control firms and the whole sample. “Diff” under Control firms calculates the average/median difference of mean/median between concept stocks and control firms each year, and “Diff” under All firms calculates the average/median difference of mean/median between concept stocks and all firms in the sample. *p*-Values under Mean are associated with robust *t*-statistic using a two-sided *t*-test of no difference in mean each year. *p*-Values under Median are associated with Wilcoxon signed rank test of no difference in median each year.

Panel B displays a transition matrix for market to sales ratios, the metric used to identify concept stocks. The body of the table reveals the probability that stocks in a particular decile in year $t - 1$ have moved to a particular decile in year t . For example, 76% of the firms in decile 10 remain in decile 10 in the next period. Approximately 69% of our concept stocks (decile 10) remain concept stocks in the next year. We also calculate the average transition probability for concept stocks in each of our subperiods and across exchanges. In results not shown, we find that while NASDAQ stocks are more likely to become concept stocks, the stability of concept stocks is higher among NYSE/AMEX firms. Approximately 72% of NYSE/AMEX concept stocks remain concept stocks in the next period compared to 66% for NASDAQ firms.

3.4. Exchanges and trading volume

Panel C of Table 3 reveals the distribution of concept stocks across the NYSE, AMEX and NASDAQ. The composition of our concept stock portfolio has shifted substantially with regard to the exchanges. NASDAQ firms comprise approximately 1.29% of our concept stocks in the 1973–1981 period but over 85% of our concept stocks in the 1994–1999 period. Of course, while these percentages relate to the composition of our concept stock sample, the total number of firms listed on each of the exchanges differs, both cross-sectionally and across time. Consequently, we also report the percentage of firms listed on a given exchange that are concept stocks. In the early 1970s, for example, around 10% of NYSE firms are concept stocks. By the end of our sample approximately 2% are concept stocks. Interestingly, the proportion of NASDAQ stocks that are also concept stocks has remained relatively stable over the past 10–15 years.

The final columns of Panel C reveal the turnover of concept stocks relative to control firms. Turnover, defined as the annual average of monthly trading volume divided by shares outstanding, averages 9.8% for concept stocks over the entire period. This is significantly greater than 7.0% for the control firms and 6.3% for the entire sample. It is also apparent that while trading volume has increased for all firms over the sample period it has increased more dramatically for concept stocks.

3.5. The industry composition of concept stocks

A summary of the industry distribution of concept stocks based on CRSP SIC codes is presented in Table 4. At the two-digit SIC level there are 99 potential industries each year. In Table 4, we select the five industries with the highest number of concept stocks and display them across each year ranked from highest (1) to fifth highest (5).¹⁸ In the case of ties, we do not skip the next rank(s). Thus, it is possible that we report more than five industries. For example, there are two industries ranked third and three industries ranked fifth in 1969.

The data reveal interesting shifts in the composition of concept stocks. Throughout the decade of the 1960s and 1970s “oil and gas extraction” frequently appear among the concept stocks. “Metal mining stocks” were slightly less popular, with slightly lower rank,

¹⁸ We use CRSP SIC codes. Kahle and Walkling (1996) show that CRSP and Compustat SIC codes differ by approximately 40% at the two-digit level and 80% at the four-digit level. While this research indicates that the specification and power of Compustat SIC classifications outperforms that of CRSP, it also notes that only the latter reveals historic SICs.

Table 4
Industry distribution of concept stocks, 1967–1999

SIC	Industry name	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
7	Agricultural Services															
10	Metal Mining	3	3	4	4	4	4	3	3	3	3	4	3	4	4	5
12	Coal Mining															
13	Oil and Gas Extraction	1	1	1	2	1*	1	1	2*	1*	1*	1*	1*	1*	1*	1*
20	Food and Kindred Products															
23	Apparel and Other Finished Products															
24	Lumber and Wood Products															
26	Paper and Allied Products															
27	Printing and Publishing											5		5		
28	Chemicals and Allied Products	2*	2*	2	1	1	2	2*	1	2	2	2	2	2	3	3
29	Petroleum and Coal Products															
30	Rubber and Misc. Plastics Products															
32	Stone, Clay, Glass, Concrete Products															
34	Fabricated Metal Products														5	
35	Industrial, Computer, Office Equipment	5*	3*	3*		4		4*	4*	5		3	3	4	3	4
36	Electronic & Other Electric Equipment		5	5	4	3	5	5		4	4*	5*		3*	2*	2*
38	Instruments and Related Products		4*	3	5	2*	3*	4*	5*		5*		4*	5*		
39	Miscellan. Manufacturing Industries															
44	Water Transportation															
48	Communications (Multimedia)					5										
49	Electric, Gas, and Sanitary Services	4		5	3	3					4	4				
50	Wholesale Trade-Durable Goods															
51	Wholesale Trade-NonDurable Goods															
56	Apparel and Accessory Stores															
58	Eating and Drinking Places															
59	Miscellaneous Retail															
70	Hotels and Other Lodging Places															
73	Business Computer Related Services			5*									5*			
78	Motion Pictures															
79	Amusement & Recreation Services															
80	Health Services															
82	Educational Services															
87	Engineering, Management & Research															

(continued on next page)

Table 4 (continued)

SIC	Industry name	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
7	Agricultural Services																		
10	Metal Mining						5		4										
12	Coal Mining																		
13	Oil and Gas Extraction	5*	5				4	4		4*									
20	Food and Kindred Products																		
23	Apparel and Other Finished Products																		
24	Lumber and Wood Products																		
26	Paper and Allied Products																		
27	Printing and Publishing																		
28	Chemicals and Allied Products	4	4*	2	1	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	2*	3
29	Petroleum and Coal Products																		
30	Rubber and Misc. Plastics Products																		
32	Stone, Clay, Glass, Concrete Products																		
34	Fabricated Metal Products																		
35	Industrial, Computer, Office Equipment	1	2	5	5	4						5		5	5				5
36	Electronic & Other Electric Equipment	1*	3*	3*	4*	5*	5*	5*			4	4*	2*	2*	3*	4*	4	4	2*
38	Instruments and Related Products	2*	3*	4*	3*	3*	3*	3*	2	3	2*	2*	2	4	4*	3*	3*	3	
39	Miscellan. Manufacturing Industries																		
44	Water Transportation																		
48	Communications (Multimedia)								5				5						
49	Electric, Gas, and Sanitary Services																		
50	Wholesale Trade-Durable Goods																		
51	Wholesale Trade-NonDurable Goods																		
56	Apparel and Accessory Stores																		
58	Eating and Drinking Places																		
59	Miscellaneous Retail																		
70	Hotels and Other Lodging Places																		
73	Business Computer Related Services	3*	1*	1*	2*	2*	2*	2*	3*	2*	3*	3*	3*	3*	2*	2*	2*	1*	1*
78	Motion Pictures																		
79	Amusement & Recreation Services																		
80	Health Services								5*	5	5*								
82	Educational Services																		
87	Engineering, Management & Research												4			5	5	5*	4

We report the top five industries by ranking the number of concept stocks for industries with at least 3 concept stocks in the industry each year. We calculate the number of concept stocks for each industry each year. Firms with the same two-digit SIC codes (from CRSP) are categorized in the same industry. The industry with an asterisk (*) indicates that it is also among the top five IPO industries in that year.

over a similar period. However, “oil and gas extraction” does not appear in the 1991–1999 period and “metal mining” does not appear after 1989. On the other hand, “business computer related services” does not appear prior to 1981 except 1969 and 1978; not coincidentally, this is around the time of the initial personal computers. This industry is among the top five in terms of concept stocks in each of the remaining years of the sample. “Engineering, management and research” also enters the sample for the first time in the decade of the 1990s and then appears in five of the eight subsequent years. Finally, four industries appear in almost all of the years of our sample. These are “chemicals and allied products”, “industrial, computer, office equipment”, “electronic and electrical equipment” and “instruments and related products”. For completeness, we also identify with an asterisk, any top five concept industry that is also a top five industry in terms of the number of IPOs in a particular year. High industry valuations present a fertile time for IPOs. As we have seen from Table 2, this does not necessarily mean that the concept stocks are themselves IPOs; less than 20% of concept stocks are IPOs.

Are the shifts in the composition of concept stocks statistically significant? We calculate the Pearson chi-square measure that tests the null hypothesis of no variation in the composition of concept stocks across industries over time. The statistic is defined as $\sum_i (f_i - e_i)^2 / e_i$, where f_i is the actual number of concept stocks in industry i and e_i is the expected number of concept stocks in industry i . Since some industries have few companies during our sample period, we only include industries with at least 10 firms to perform the test.¹⁹ The Pearson chi-square statistic is 3727 with degrees of freedom equal to 44 (number of industries minus one). The associated p -value, (<0.001), indicates that concept stocks are concentrated in some industries.

3.6. *The longevity of concept stocks*

In this section we begin our analysis of the investment characteristics of concept stocks. We first address the survival of concept stocks over time by calculating the percentage of concept and control stocks delisted within 10 years after selection. We then compute the mean/median differences in percentage of firms delisted after n years ($n = 1$ –10) between concept stocks and control firms and examine significance tests for the hypothesis of no difference.

The results (not shown in a table) indicate that the longevity of concept stocks has declined since the late 1970s. Two-thirds of the concept stocks from 1972 were still trading 10 years later; the corresponding figure for the concept stocks of the decade beginning with 1978 is around 60%. As before, this corresponds to the period where negative profitability becomes dominant among concept stocks. Corresponding figures for control firms also show a similar decline in longevity. The percentage of control firms still listed 10 years after selection declines throughout our sample period but is generally higher than that of concept stocks.

CRSP lists four primary reasons for the delisting of firms: acquired by merger; acquired by exchange of stock; liquidated; and dropped by NYSE, AMEX or NASDAQ. We find that 2249 concept stocks are delisted over the sample period in comparison to 1920 control firms. For both concept stocks and control firms, the major delisting reason is due to merger, 67.3% for concept stocks and 75.8% for control firms. The second reason for delisting

¹⁹ When we change the requirement of ten firms to five firms, our result is not affected.

Table 5

Accounting performance of concept stocks and control firms, 1967–1999

Year	LTD		R&D/Sales		Adv/Sales		Capex/Sales	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Panel A: Debt, R&D, advertising and capital expenditures</i>								
<i>Concept stocks</i>								
–2	0.0747	0.0192	0.2767	0.0206	0.01093	0.00002	0.246	0.100
–1	0.0639	0.0157	0.3334	0.0370	0.01208	0.00003	0.273	0.112
0	0.0590	0.0127	0.3917	0.0536	0.01467	0.00004	0.313	0.131
+1	0.0765	0.0219	0.3042	0.0440	0.01250	0.00002	0.260	0.110
+2	0.0956	0.0319	0.2460	0.0366	0.01328	0.00001	0.225	0.100
<i>Control firms</i>								
–2	0.1577	0.1043	0.0246	0.0000	0.01501	0.00000	0.058	0.041
–1	0.1517	0.0932	0.0280	0.0000	0.01201	0.00000	0.055	0.039
0	0.1457	0.0929	0.0316	0.0000	0.01174	0.00000	0.056	0.038
+1	0.1503	0.0995	0.0276	0.0000	0.01282	0.00000	0.061	0.041
+2	0.1652	0.1158	0.0283	0.0000	0.01391	0.00000	0.063	0.042
<i>Difference (concept – control)</i>								
–2	–0.0893	–0.0367	0.2422	0.0000	–0.00096	0.00000	0.194	0.054
	(0.000)	(0.000)	(0.000)	(0.000)	(0.290)	(0.000)	(0.000)	(0.000)
–1	–0.0871	–0.0442	0.2620	0.0048	–0.00019	0.00000	0.212	0.068
	(0.000)	(0.000)	(0.000)	(0.000)	(0.797)	(0.000)	(0.000)	(0.000)
0	–0.0824	–0.0378	0.2709	0.0275	0.00200	0.00001	0.237	0.079
	(0.000)	(0.000)	(0.000)	(0.000)	(0.051)	(0.000)	(0.000)	(0.000)
+1	–0.0701	–0.0348	0.2217	0.0127	–0.00056	0.00000	0.193	0.064
	(0.000)	(0.000)	(0.000)	(0.000)	(0.534)	(0.000)	(0.000)	(0.000)
+2	–0.0676	–0.0359	0.1937	0.0226	–0.00076	0.00000	0.161	0.056
	(0.000)	(0.000)	(0.000)	(0.000)	(0.401)	(0.000)	(0.000)	(0.000)
Year	Operating margin		ROA		Profit margin		ROE	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Panel B: Profitability characteristics</i>								
<i>Concept stocks</i>								
–2	–0.121	0.220	0.113	0.158	–0.272	0.110	0.181	0.262
–1	–0.245	0.210	0.085	0.144	–0.394	0.106	0.127	0.228
0	–0.424	0.182	0.025	0.107	–0.590	0.094	0.003	0.164
+1	–0.193	0.202	0.071	0.140	–0.346	0.102	0.073	0.220
+2	–0.058	0.210	0.103	0.152	–0.212	0.102	0.154	0.248
<i>Control firms</i>								
–2	0.127	0.122	0.194	0.193	0.045	0.051	0.475	0.376
–1	0.127	0.126	0.193	0.194	0.045	0.051	0.531	0.390
0	0.123	0.124	0.186	0.191	0.038	0.051	0.563	0.409
+1	0.135	0.129	0.198	0.199	0.054	0.056	0.622	0.394
+2	0.135	0.125	0.194	0.192	0.055	0.053	0.410	0.374
<i>Difference (concept – control)</i>								
–2	–0.227	0.120	–0.076	–0.019	–0.298	0.072	–0.296	–0.105
	(0.028)	(0.213)	(0.001)	(0.003)	(0.004)	(0.213)	(0.000)	(0.000)
–1	–0.290	0.111	–0.093	–0.040	–0.359	0.070	–0.350	–0.182
	(0.010)	(0.435)	(0.000)	(0.000)	(0.002)	(0.435)	(0.000)	(0.000)
0	–0.358	0.083	–0.120	–0.046	–0.440	0.061	–0.450	–0.192
	(0.003)	(0.720)	(0.000)	(0.000)	(0.001)	(0.733)	(0.000)	(0.000)

Table 5 (continued)

Year	Operating margin		ROA		Profit margin		ROE	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
+1	-0.229 (0.014)	0.097 (0.430)	-0.103 (0.000)	-0.042 (0.000)	-0.304 (0.002)	0.054 (0.510)	-0.460 (0.003)	-0.174 (0.000)
+2	-0.152 (0.052)	0.101 (0.180)	-0.080 (0.000)	-0.037 (0.000)	-0.228 (0.004)	0.052 (0.194)	-0.233 (0.000)	-0.135 (0.000)

We compare the accounting performance of concept stocks with that of control firms 2 years before and after the concept stocks are selected (Year 0). Long-term debt ratio (LTD) is debt in current liabilities plus long-term debt divided by firm market size. Operating margin is defined as operating income before depreciation divided by sales. Return on assets is defined as operating income before depreciation divided by assets. Profit margin is net income divided by sales. Return on equity is operating income before depreciation divided by the sum of book value and preferred stock. Book values and market values not used in ratios are deflated using the CPI into 1998 dollars. Control firms are chosen using a two-way matching procedure involving size and the book-to-market ratio. First, we identify the subset of matching candidates that have market values within 30% of a concept stock and are not concept stocks themselves in the previous 2 years. From this subset, the firm with the closest book-to-market ratio is chosen as the control firm. If the subset contains fewer than five candidate firms, we expand the range of market value to be within 40%. “Difference” calculates the mean/median difference between concept stocks and control firms each year. *p*-Values under Mean, as reported in parentheses, are associated with robust *t*-statistic using a two-sided *t*-test of no difference in mean each year. *p*-Values under Median are associated with Wilcoxon signed rank test of no difference in median each year.

is that they were dropped from NYSE, AMEX or NASDAQ. This occurs for 26.7% of the concept stocks in comparison to 18.9% of the control firms. Importantly, these are not bankruptcy cases; those are covered under liquidation. The “dropped” cases occur because the firms move to another exchange or because they fail to meet exchange requirements (an insufficient number of market makers, etc). Although differences do exist in particular years, there is no evidence that concept stocks are more likely to be delisted over the entire sample period.

4. The relative performance of concept stocks

4.1. Accounting performance

It is argued that the fundamentals of concept stock preclude transparent valuation. We begin our analysis of the relative performance of concept stocks by examining accounting performance. Table 5 reveals changes in key accounting ratios of both concept stocks and control firms from the period 2 years before the selection of the firm as a concept or control stock to 2 years after the selection. We test for significant differences in the means of the variables using a two-sided robust *t*-test. Differences in medians are analyzed with the Wilcoxon signed rank test.²⁰

Panel A reveals data on long-term debt, research and development, advertising, and capital expenditures. Concept stocks have significantly smaller amounts of long-term debt than control firms in each of the 5 years analyzed. However, levels of R&D and capital expenditures and the median levels of advertising to sales are significantly greater for

²⁰ To ensure comparability, when either the concept firm or the control firm is delisted, we exclude its counterpart in the sample.

concept stocks than for control stocks for each year analyzed. This is consistent with the popular notion that these firms have unusual potential for future returns.

Panel B reveals several profitability measures in the 5 years surrounding year zero. Values are reported for the operating margin, returns on assets, profit margin, and operating returns on equity. With a few exceptions, concept firms are generally less profitable than their control firm counterparts. We do not observe a definitive trend towards more or less profitability over time.

4.2. Logistic analysis of concept stocks vs. control stocks

Table 6 presents a logistic analysis of the factors related to concept stocks. In particular, we ask: “What variables distinguish concept stocks from the stocks of other companies?” and “Do these variables change over time?” We report the results from annual logistic regressions. In the spirit of Fama and MacBeth (1973), we first run the regressions year by year and then use the time-series coefficients and standard deviations from these time series to calculate the significance of the estimates. The advantage of this procedure is to control for correlation of the regression residuals across firms. The dependent variable is set equal to one for concept stocks and zero for either all other firms or control firms. Separate regressions include industry dummies and year dummies.

Our results indicate that for the overall sample period, the probability of being a concept stock is negatively related to leverage, profitability and age. The results are statistically and economically significant. For instance, model 1 indicates that a 1% increase in debt ratio is associated with 2.5% drop in probability that the firm will be selected as a concept stock. Surprisingly, after controlling for other factors, the probability of being a concept stock is insignificantly related to being listed on NASDAQ. This result, for the entire 33-year period, is consistent with the shifting patterns of exchange identity of concept stocks noted earlier in the paper. The probability of being a concept stock is significantly positively related to research and development expenditures and capital expenditures while it is negatively related to the book-to-market ratio. Thus, concept firms are smaller, less levered and less profitable, but are spending significantly more on R&D and capital expenditures. As proxied by the book-to-market ratio, they have higher growth opportunities. Proponents of concept stocks typically argue that these higher expenditures and greater growth opportunities will translate into higher subsequent returns. We turn to this issue in the next section.

4.3. Long-run market returns

It is important to note that our analysis is not an event study. Our firms do enter the sample in a particular year, however and to test our hypothesis we need to study the subsequent (long term or short term) performance of concept stocks. The current literature is divided on the best methodology for identifying long run abnormal returns. Loughran and Ritter (2000) and Barber and Lyon (1997) argue for the use of buy-and-hold returns. Fama and French (1993), Fama (1998), Mitchell and Stafford (2000) and Brav et al. (2000) argue for the use of the Fama–French three-factor model. Rather than choosing one approach in our tests of the long-term performance of concept stocks, we use both. Notice, however, that studies using the Fama–French three-factor model are less likely to find abnormal returns.

Table 6
Logistic analysis of concept stocks vs. control firms

Explanatory variable	Concepts vs. all other firms					Concepts vs. controls				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<i>Size, age, exchange, and volume variables</i>										
Firm age	−0.011 (0.011) [−0.003]		−0.026 (0.000) [−0.007]			−0.051 (0.000) [−0.012]		−0.103 (0.000) [−0.021]		
Log(book value)		−0.028 (0.272) [−0.007]		−0.084 (0.000) [−0.021]			−0.179 (0.000) [−0.044]		−0.544 (0.004) [−0.132]	
Nasdaq		−1.133 (0.130) [−0.269]		−0.584 (0.296) [−0.144]	−0.393 (0.469) [−0.098]		1.740 (0.176) [0.386]		0.825 (0.544) [0.201]	1.814 (0.108) [0.399]
Trading volume		−0.680 (0.440) [−0.170]		−0.216 (0.852) [−0.054]			0.108 (0.952) [0.027]		4.094 (0.113) [0.983]	
<i>Leverage, investment, advertising, and capital expenditure characteristics</i>										
Long-term debt	−11.90 (0.000) [−2.513]	−12.05 (0.000) [−2.534]	−13.57 (0.000) [−2.729]	−13.94 (0.000) [−2.771]	−14.88 (0.000) [−2.869]	−12.22 (0.000) [−2.558]	−13.16 (0.000) [−2.680]	−24.04 (0.000) [−3.177]	−25.91 (0.000) [−3.123]	−25.76 (0.000) [−3.128]
R&D/BV	6.183 (0.000) [0.723]	6.174 (0.000) [0.724]	8.232 (0.000) [0.592]	10.278 (0.000) [0.430]	8.788 (0.000) [0.548]	11.989 (0.000) [0.311]	14.167 (0.000) [0.196]	14.391 (0.000) [0.187]	24.273 (0.000) [0.017]	18.743 (0.000) [0.067]
Adv/BV	−0.838 (0.294) [−0.210]	−0.827 (0.321) [−0.207]	−0.578 (0.570) [−0.144]	−0.811 (0.434) [−0.203]	−0.993 (0.281) [−0.248]	3.470 (0.045) [0.867]	3.682 (0.042) [0.920]	6.326 (0.127) [1.578]	3.512 (0.363) [0.877]	2.608 (0.368) [0.652]
Capital expenditure	9.430 (0.000) [0.522]	9.569 (0.000) [0.511]	8.935 (0.000) [0.562]	9.191 (0.000) [0.541]	9.227 (0.000) [0.538]	14.931 (0.000) [0.181]	15.972 (0.000) [0.143]	27.515 (0.000) [0.008]	29.087 (0.000) [0.006]	24.984 (0.000) [0.016]
Book-to-market	−7.452 (0.000) [−0.650]	−7.372 (0.000) [−0.656]	−8.235 (0.000) [−0.592]	−7.594 (0.000) [−0.640]	−7.781 (0.000) [−0.627]	−1.837 (0.000) [−0.426]	−1.882 (0.000) [−0.435]	−6.652 (0.000) [−0.701]	−5.249 (0.000) [−0.746]	−5.427 (0.000) [−0.744]

(continued on next page)

Table 6 (continued)

Explanatory variable	Concepts vs. all other firms					Concepts vs. controls				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<i>Profitability-related variables</i>										
Return on assets					−3.629 (0.000) [−0.907]					−4.158 (0.000) [−1.039]
Return on equity	−2.055 (0.000) [−0.514]	−2.083 (0.000) [−0.521]	−2.219 (0.000) [−0.555]			−2.729 (0.000) [−0.682]	−2.775 (0.000) [−0.694]	−3.754 (0.000) [−0.938]		
Positive earnings			0.842 (0.270) [0.191]	−0.406 (0.395) [−0.099]				−1.298 (0.337) [−0.260]	−1.298 (0.394) [−0.260]	
Intercept	1.429 (0.000)	1.404 (0.000)	−1.972 (0.046)	−1.481 (0.149)	−1.776 (0.056)	0.973 (0.000)	1.225 (0.003)	6.226 (0.023)	5.329 (0.066)	1.959 (0.376)
Industry dummy			Yes	Yes	Yes			Yes	Yes	Yes

All regressions are significant at the 1% level.

In the spirit of Fama and MacBeth, Logit regressions are estimated for each year of the 1967–1999 period. The dependent variable takes one for concept stocks and zero otherwise. Firm age is defined as the difference between year of interest and the earliest year that the firm has traded stock price available in CRSP. Long-term debt (LTD) ratio is debt in current liabilities plus long-term debt divided by firm market size. Book value is total assets minus total liabilities and preferred stock. Firm book size is the natural logarithm of book value. Return on assets is defined as operating income before depreciation divided by assets. Return on equity is operating income before depreciation divided by the sum of book value and preferred stock. Nasdaq is a dummy variable equal to one if the firm stock trades in Nasdaq and zero if in NYSE/AMEX. Trading volume (as average turnover) is defined as the annual average of monthly trading volume divided by shares outstanding. Positive earnings is a dummy variable equal to one if the firm reports positive earnings in the selection year and zero otherwise. Following [Fama and French \(2001\)](#), we report means of the regression estimates across years. Robust standard errors are computed using White procedure. *p*-Values are in parentheses. Marginal effects, evaluated at means, are reported in brackets.

4.3.1. Calendar-time portfolio regressions

In Table 7 we analyze calendar-time portfolio regressions using the portfolio return of concept stocks, control stocks, or a zero-investment portfolio as indicated. Zero-investment portfolios are formed by creating a long position in the concept stocks and a short position in matching firms. Each month we form equal and value-weighted portfolios containing all concept stocks chosen in the previous year. The value-weighted portfolios are rebalanced monthly. Matching firms are drawn from a population of NYSE/AMEX/NASDAQ stocks using the combined size and book-to-market matching procedure. We analyze five sets of regressions. The first and second sets of regressions use the market return and the Fama and French (1993) factors, respectively, as independent variables.²¹ The third set of regressions add the Carhart (1997) momentum factor, constructed as the return difference of all CRSP firms in the highest and lowest return terciles over the previous 11 months.²² The fourth set of regressions adds turnover for both concept stocks and matched stocks as appropriate. The final set of regressions adds dummy variables for returns in January, December and in “hot” periods. A “hot” period is a dummy variable set equal to one in expansion months and zero in contraction months as designated by the NBER.²³

Since we are interested in the performance of concept stocks relative to that of our control firms, we focus our interpretation on the zero-investment portfolios. As shown in Table 7, our control stocks typically have significantly positive intercepts in the Fama–French regressions. This is the opposite of the typical result for glamour stocks. In the portfolios of concept stocks and control firms, the significantly negative coefficients of the book-to-market variables indicate that both concept and control firms have lower book-to-market ratios relative to the market. The coefficients of SMB suggest that the control firms tend to be smaller than the average firms in the market. The concept firms also tend to be smaller in the equal-weighted portfolios but the coefficients are insignificant in the value-weighted portfolios.

Most importantly, the intercept for the zero-investment portfolio is significantly negative in all five sets of regressions. Thus, the concept stocks under-perform their control firms regardless of the set of variables used to control for risk characteristics. Similar results are noted for the value-weighted portfolios shown in Panel B.

We further examine relative long-term performance on 10 subsets of firms. Panel C reports the coefficients of intercepts from zero-investment portfolios. The subsets examine survivorship, exchange, time period, IPO, and SEO effects. In our matching of concept to control firms, we are careful to employ the same criteria for each. That is, concept firms that survive must be matched with control firms that survive; concept firms on NASDAQ must be matched with control firms from NASDAQ, etc. The exceptions to this in Panel C

²¹ We thank Ken French for providing us with the return series on these three factors.

²² In ranking previous-year returns, we skip the last month in the portfolio formation period to reduce the potential bias from bid-ask bounces and monthly return reversals.

²³ We note an important methodological issue raised by Loughran and Ritter (2000). They argue that mixing firms with large and small capitalization will result in low power in detecting long-run abnormal returns. The problem is particularly severe when a value-weighted index is used. Our concept stocks exhibit very different size characteristics across time. Consequently, the results presented below should be interpreted with this issue in mind. For an alternate view on this issue, see Mitchell and Stafford (2000).

Table 7
Calendar-time portfolio regressions, 01/1967–12/1999

Portfolio	Inter.	MktRP	SMB	HML	PR1YR	Volume (concept)	Volume (match)	Jan	Dec	Hot	Adj. R^2
<i>Panel A: Equally-weighted portfolios</i>											
Concept	−0.005 (0.007)	1.346 (0.000)									0.745
Control	0.019 (0.000)	1.257 (0.000)									0.785
Zero	−0.024 (0.000)	0.089 (0.017)									0.017
Concept	−0.002 (0.156)	1.025 (0.000)	0.709 (0.000)	−0.673 (0.000)							0.883
Control	0.020 (0.000)	1.021 (0.000)	0.803 (0.000)	−0.273 (0.000)							0.920
Zero	−0.022 (0.000)	0.005 (0.901)	−0.094 (0.099)	−0.400 (0.000)							0.139
Concept	−0.001 (0.286)	1.025 (0.000)	0.694 (0.000)	−0.683 (0.000)	−0.033 (0.450)						0.883
Control	0.019 (0.000)	1.020 (0.000)	0.840 (0.000)	−0.250 (0.000)	0.078 (0.011)						0.922
Zero	−0.021 (0.000)	0.004 (0.920)	−0.146 (0.013)	−0.432 (0.000)	−0.111 (0.025)						0.154
Concept	−0.002 (0.296)	1.024 (0.000)	0.696 (0.000)	−0.680 (0.000)	−0.031 (0.478)	0.008 (0.707)					0.883
Control	0.014 (0.000)	1.015 (0.000)	0.844 (0.000)	−0.229 (0.000)	0.083 (0.007)		0.069 (0.005)				0.924
Zero	−0.017 (0.000)	−0.009 (0.826)	−0.153 (0.007)	−0.448 (0.000)	−0.117 (0.021)	−0.024 (0.725)	−0.017 (0.861)				0.157
Concept	0.002 (0.565)	1.017 (0.000)	0.699 (0.000)	−0.715 (0.000)	0.027 (0.543)	0.013 (0.553)		0.016 (0.001)	−0.008 (0.079)	−0.007 (0.053)	0.887
Control	0.022 (0.000)	1.016 (0.000)	0.849 (0.000)	−0.244 (0.000)	0.109 (0.001)		0.090 (0.000)	0.007 (0.065)	−0.001 (0.811)	−0.012 (0.000)	0.929
Zero	−0.021 (0.000)	0.000 (0.998)	−0.155 (0.006)	−0.468 (0.000)	−0.084 (0.105)	−0.018 (0.794)	−0.036 (0.712)	0.008 (0.107)	−0.007 (0.105)	0.005 (0.218)	0.164
<i>Panel B: Value-weighted portfolios</i>											
Concept	0.006 (0.000)	1.148 (0.000)									0.701
Control	0.017 (0.000)	1.157 (0.000)									0.789
Zero	−0.010 (0.000)	−0.010 (0.795)									−0.002
Concept	0.010 (0.000)	0.938 (0.000)	−0.051 (0.355)	−0.853 (0.000)							0.820
Control	0.019 (0.000)	1.032 (0.000)	−0.002 (0.968)	−0.488 (0.000)							0.831
Zero	−0.009 (0.000)	−0.094 (0.034)	−0.048 (0.511)	−0.365 (0.000)							−0.065

Concept	0.011 (0.000)	0.938 (0.000)	−0.058 (0.336)	−0.857 (0.000)	−0.016 (0.739)							0.819
Control	0.018 (0.000)	1.032 (0.000)	0.051 (0.443)	−0.455 (0.000)	0.114 (0.018)							0.836
Zero	−0.007 (0.000)	−0.095 (0.036)	−0.110 (0.172)	−0.402 (0.000)	−0.130 (0.016)							0.080
Concept	0.004 (0.019)	0.922 (0.000)	−0.026 (0.648)	−0.841 (0.000)	−0.001 (0.984)	0.074 (0.002)						0.827
Control	0.008 (0.000)	1.022 (0.000)	0.067 (0.278)	−0.421 (0.000)	0.126 (0.006)		0.170 (0.000)					0.851
Zero	−0.004 (0.091)	−0.110 (0.011)	−0.071 (0.337)	−0.427 (0.000)	−0.118 (0.030)	0.152 (0.033)	−0.289 (0.028)					0.109
Concept	0.005 (0.035)	0.907 (0.000)	−0.034 (0.547)	−0.888 (0.000)	0.064 (0.188)	0.076 (0.001)		0.021 (0.000)	−0.004 (0.289)	−0.003 (0.193)		0.834
Control	0.017 (0.000)	1.025 (0.000)	0.074 (0.225)	−0.435 (0.000)	0.147 (0.002)		0.192 (0.000)	0.006 (0.188)	−0.001 (0.857)	−0.012 (0.001)		0.855
Zero	−0.011 (0.006)	−0.126 (0.002)	−0.087 (0.236)	−0.459 (0.000)	−0.076 (0.184)	0.145 (0.043)	−0.296 (0.025)	0.015 (0.010)	−0.004 (0.509)	0.008 (0.059)		0.120

	Equal-weighted	Value-weighted
<i>Panel C: Coefficients of intercepts from zero-investment portfolios (concept – control) based on various subsamples</i>		
(I) Active concept and control firms (still active in 1999)	0.001 (0.425)	0.002 (0.297)
(II) Firms with non-negative earnings	0.001 (0.321)	0.003 (0.112)
(III) NYSE/AMEX firms	0.001 (0.589)	−0.001 (0.511)
(IV) NASDAQ firms	−0.005 (0.258)	−0.002 (0.665)
(V) Years before 1981 (≤1981)	−0.015 (0.000)	−0.008 (0.000)
(VI) Years after 1981 (>1981)	−0.025 (0.000)	−0.007 (0.009)
(VII) Non-IPO firms	−0.018 (0.000)	−0.014 (0.000)
(VIII) IPO firms	−0.024 (0.000)	−0.022 (0.000)
(IX) Non-SEO firms	0.000 (0.858)	0.002 (0.322)
(X) SEO firms	0.001 (0.890)	−0.001 (0.817)

The dependent variable is the portfolio return of concept stocks, match firms or the zero-investment portfolios. The portfolio return is adjusted by the risk-free rate, if necessary. The zero-investment portfolio is formed by going long in concept stocks and short in matching firms. Each month we form equal- and value-weighted portfolios containing all concept stocks chosen in the previous year. The portfolios are rebalanced monthly. Matching firms are drawn from the population of NYSE/AMEX/Nasdaq by matching size and book-to-market. MktRP, SMB, and HML are the Fama and French (1993) market, size, and book-to-market factors, respectively. PR1YR is Carhart (1997) momentum factor and is constructed as the return difference of all CRSP firms in the highest and the lowest terciles over the previous twelve months. Volume is calculated as the monthly trading volume divided by total shares outstanding (turnover ratio). Jan and Dec are January and December dummies. Hot is a dummy variable assigned to 1/0 in expansion/contraction months designated by NBER. Panel C reports the regression intercepts from Carhart four-factor models. Standard errors are computed using White robust estimator. *p*-Values are in parentheses.

are that concept stocks that are IPOs or SEOs are matched against all control firms, not just IPO or SEO controls. There are too few IPO or SEO firms for a meaningful match.

When firms are delisted, our procedure implicitly assumes sale of the stock at the last quoted price. It is not hard to imagine that in the event of extreme financial distress, this last quoted price might not be realizable. On average, we would expect this problem (if it exists) to impart an upward bias in our measure of concept stock returns. This is because a higher proportion (26.7%) of concept stocks are dropped by NYSE, AMEX and NASDAQ or liquidated in comparison to the figure for control firms (18.9%).

Another way to analyze the impact of any delisting bias is to examine the subsample of firms still trading. Restricting our analysis to those firms that actually survived to the end of our sample eliminates any significant under-performance. Obviously, such foresight is impossible in practice. Still, the results indicate that at least some of the under-performance of concept stocks is due to the firms that fail to survive.

A criterion that *can* be implemented *ex ante* is the selection of firms with positive earnings or firms on certain exchanges. Our results indicate that firms with positive earnings and subsets of firms on various exchanges perform similarly to the control firms. In addition, concept stocks significantly under-perform in both the post-1981 and the 1967–1980 periods. We also note that under-performance is not an IPO effect; it exists for both IPO and non-IPO firms. Finally, we do not find evidence that SEO concept stocks have different performance than our control sample.

4.3.2. *Buy-and-hold returns*

An alternate procedure to analyze long-term performance is to use buy-and-hold returns (Loughran and Ritter, 2000; Barber and Lyon, 1997). Table 8 presents a yearly analysis of the 5-year buy-and-hold abnormal returns of concept stocks and their matching firms. Fig. 2 presents a corresponding graph revealing monthly results over the 5-year period. In our analysis of 5-year buy-and-hold abnormal returns we first use the original matching procedure of size and market to book ratio. Since, many measures of performance are mean reverting, Barber and Lyon (1997) note the importance of controlling for pre-event performance in choosing matching firms. Failure to control for this produces mis-specified results. As a consequence, we also test for differences with four other sets of control firms. Two sets of control firms are derived by first matching by size and then by earnings and cash flows, respectively. A fourth control sample matches by firms in the same three-digit CRSP SIC code and then by size. A fifth set of control firms are matched by firm age and then by market to book ratio. As before, we require that control firms not have been concept stocks in the previous 2 years. If concept stock is delisted, we substitute the control firm's return in the concept return series and vice versa until both firms are delisted. In this case, both firms drop out of the portfolio.

Results for the entire sample are presented in Panel A. Because of the need to match firms and the availability of data, sample sizes vary slightly depending on the criteria chosen. However, regardless of the matching criteria used to form a control sample, we find that the short and long run performance of concept stocks is negative relative to that of the control samples. It is immediately apparent from Fig. 2 that the long run performance of concept stocks is inferior to that of our initial control sample or any other control sample applied. The only exception is the restriction of the concept stocks to NYSE and AMEX firms and years before 1981. These firms perform about the same as their control sample over the entire 5-year period.

Table 8

5-Year buy-and-hold returns (BHRs) of concept stocks and their matching firms, 1967–1999

Matching procedure	Year	Concept (%)	Control (%)	Diff (%)	<i>t</i> (Diff)	<i>p</i> -Value	<i>N</i>
<i>Panel A: Whole sample</i>							
Size and book-to-market	1	11.92	14.24	−2.32	−1.89	(0.058)	6535
	2	19.00	24.84	−5.85	−2.71	(0.007)	6175
	3	30.69	38.10	−7.41	−1.99	(0.047)	5759
	4	46.11	64.98	−18.88	−4.55	(0.000)	5351
	5	64.55	77.15	−12.60	−2.91	(0.004)	4979
Size and return on equity	1	11.62	14.61	−2.99	−2.47	(0.014)	6526
	2	19.21	29.27	−10.06	−4.59	(0.000)	6162
	3	31.09	46.42	−15.33	−4.11	(0.000)	5734
	4	44.87	70.22	−25.35	−6.80	(0.000)	5307
	5	66.90	97.59	−30.69	−6.46	(0.000)	4920
Size and operating margin	1	11.78	10.40	1.38	1.22	(0.224)	6538
	2	20.17	32.02	−11.85	−5.38	(0.000)	6165
	3	30.87	52.01	−21.14	−5.41	(0.000)	5711
	4	44.38	77.06	−32.68	−9.86	(0.000)	5376
	5	65.50	104.02	−38.52	−7.64	(0.000)	4898
Industry and size	1	12.18	19.62	−7.44	−6.14	(0.000)	6483
	2	18.98	42.20	−23.22	−10.07	(0.000)	6107
	3	31.70	64.39	−32.69	−8.61	(0.000)	5681
	4	46.05	91.23	−45.18	−12.97	(0.000)	5248
	5	67.95	126.50	−58.55	−12.90	(0.000)	4851
Firm age and book-to-market	1	11.95	15.91	−3.97	−3.10	(0.002)	6539
	2	18.58	25.47	−6.89	−3.25	(0.001)	6195
	3	30.47	40.43	−9.96	−2.60	(0.009)	5784
	4	46.57	68.67	−22.10	−4.94	(0.000)	5376
	5	64.83	83.58	−15.75	−3.97	(0.000)	4990
<i>Panel B: Long-run performance based on subsamples</i>							
<i>(I) Active concept and control firms (still active in 1999)</i>							
Size and book-to-market	1	19.10	15.92	3.19	1.68	(0.094)	3377
	2	29.07	29.60	−0.53	−0.14	(0.886)	3089
	3	44.81	47.11	−2.31	−0.32	(0.749)	2801
	4	57.46	67.65	−10.20	−1.54	(0.124)	2537
	5	82.41	87.37	−4.96	−0.61	(0.542)	2322
<i>(II) Firms with non-negative earnings</i>							
Size and book-to-market	1	13.34	13.32	0.02	0.02	(0.987)	4357
	2	21.43	24.27	−2.84	−1.53	(0.125)	4227
	3	33.17	38.50	−5.33	−2.02	(0.043)	4096
	4	55.11	61.96	−6.85	−1.43	(0.153)	3940
	5	75.57	73.59	1.98	0.37	(0.712)	3768
<i>(III) NYSE/AMEX firms</i>							
Size and book-to-market	1	11.50	10.74	0.76	0.67	(0.506)	3293
	2	21.03	21.29	−0.27	−0.14	(0.892)	3230
	3	31.86	33.70	−1.83	−0.72	(0.470)	3173
	4	50.10	51.34	−1.24	−0.33	(0.740)	3105
	5	71.30	70.87	0.43	0.08	(0.932)	3024
<i>(IV) NASDAQ firms</i>							
Size and book-to-market	1	12.57	16.15	−3.58	−1.60	(0.110)	3191
	2	16.12	25.65	−9.53	−2.40	(0.017)	2890
	3	29.01	43.17	13.15	−1.70	(0.090)	2538
	4	42.13	107.94	−65.81	−5.32	(0.000)	2200
	5	57.44	93.46	−36.02	−4.28	(0.000)	1902

(continued on next page)

Table 8 (continued)

Matching procedure	Year	Concept (%)	Control (%)	Diff (%)	<i>t</i> (Diff)	<i>p</i> -Value	<i>N</i>
<i>(V) Years before 1981 (≤ 1981)</i>							
Size and book-to-market	1	11.44	7.89	3.55	2.74	(0.006)	2019
	2	20.52	18.16	2.36	1.05	(0.295)	2011
	3	32.52	32.94	−0.42	−0.14	(0.890)	2002
	4	49.38	47.33	2.06	0.52	(0.601)	1987
	5	68.64	66.06	2.59	0.50	(0.615)	1973
<i>(VI) Years after 1981 (> 1981)</i>							
Size and book-to-market	1	12.14	17.08	−4.94	−2.95	(0.003)	4516
	2	18.26	28.07	−9.81	−3.26	(0.001)	4164
	3	29.72	40.85	−11.14	−2.03	(0.042)	3757
	4	44.17	75.41	−31.24	−5.07	(0.000)	3364
	5	61.86	84.43	−22.57	−3.57	(0.000)	3006
<i>(VII) Non-IPO firms</i>							
Size and book-to-market	1	14.16	16.71	−2.55	−1.96	(0.050)	6334
	2	20.07	30.74	−10.67	−5.15	(0.000)	6090
	3	28.71	45.88	−17.16	−6.86	(0.000)	5808
	4	45.49	67.63	−22.14	−5.47	(0.000)	5544
	5	64.67	83.16	−18.49	−4.31	(0.000)	5237
<i>(VIII) IPO firms</i>							
Size and book-to-market	1	9.71	12.53	−2.82	−0.74	(0.460)	1305
	2	20.07	21.43	−1.35	−0.18	(0.860)	1166
	3	43.26	36.89	6.36	0.35	(0.728)	1009
	4	28.35	43.94	−15.58	−1.76	(0.079)	846
	5	49.67	53.09	−3.43	−0.29	(0.771)	712
<i>(IX) Non-SEO firms</i>							
Size and book-to-market	1	3.32	13.47	−10.15	−5.26	(0.000)	887
	2	7.31	25.65	−18.35	−6.21	(0.000)	985
	3	16.19	40.38	−24.18	−6.38	(0.000)	1039
	4	27.66	50.14	−22.48	−5.05	(0.000)	1071
	5	47.20	69.18	−21.98	−3.19	(0.002)	1064
<i>(X) SEO firms</i>							
Size and Book-to-market	1	26.96	15.00	11.96	5.99	(0.000)	2228
	2	42.86	30.29	12.57	3.47	(0.001)	1961
	3	58.85	42.64	16.22	3.40	(0.001)	1754
	4	82.70	71.76	10.93	1.37	(0.170)	1598
	5	115.12	91.77	23.36	2.55	(0.011)	1378

BHRs are calculated as the difference between the equal-weighted portfolio returns of concept stocks and control firms. The control firms are chosen using various two-way matching procedures. In all procedures, available benchmarks are CRSP firms, and are not concept stocks in the previous 2 years. The first three subsets of matching candidates are firms that have market values within 30% of the market value of the concept stock. In the first (second, third) procedure, the firm with the closest book-to-market ratio (earnings, cash flows) is chosen as the control firm. If the subset contains fewer than five candidate firms, we expand the range of market value to be within 40%. The fourth subset of matching candidates contains firms with the same three-digit industry code as the concept stock. If the subset contains less than five firms, we include firms with the same two-digit industry code. The firm with the closest equity market value to that of the concept stock is chosen as the control firm. The fifth procedure matches each concept stocks with the firm that has the same age and the closest book-to-market ratio. The other procedures constrain the sample based on other characteristics such as delisting, exchanges, time periods, IPOs, and SEOs. “Diff” reports the cross-sectional difference of buy-and-hold returns between the concept stocks and the control firms. The robust *t*-statistics, *t*(Diff), are calculated using a two-sided test of no difference. *p*-Values are in parentheses.

When we restrict our analysis to firms still active at the end of our sample, the negative performance is not significant.²⁴ A separate analysis is conducted on firms with non-neg-

²⁴ Further investigation shows that in fact, concept stocks *significantly under-perform* relative to control firms in 36 out of 60 months. The under-performance is more severe in years three and beyond.

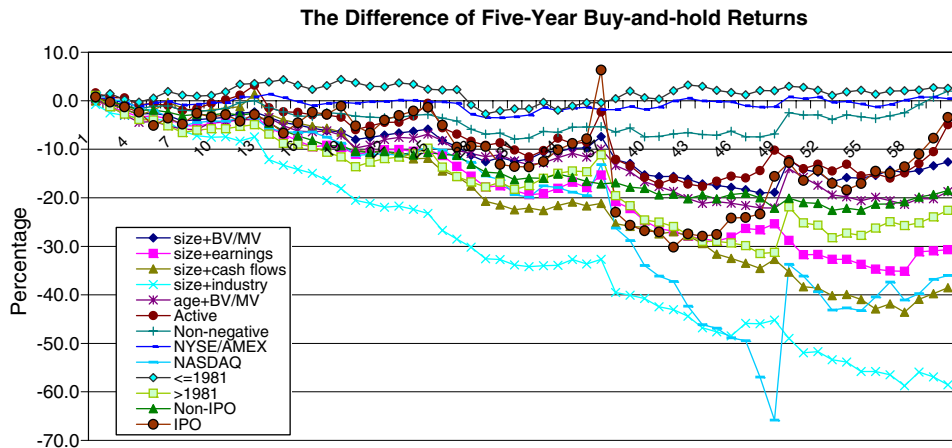


Fig. 2. 5-Year buy-and-hold abnormal returns. Plot of difference in buy-and-hold returns between concept stocks and control firms. The control firms are chosen using various two-way matching procedures based on firm characteristics. In all procedures, available benchmarks are CRSP firms, and are not concept stocks in the previous 2 years. The first three subsets of matching candidates are firms that have market values within 30% of the market value of the concept stock. In the first (second, third) procedure, the firm with the closest book-to-market ratio (earnings, cash flows) is chosen as the control firm. If the subset contains fewer than five candidate firms, we expand the range of market value to be within 40%. The fourth subset of matching candidates includes firms with the same three-digit industry code as the concept stock. If the subset contains less than five firms, we include firms with the same two-digit industry code. The firm with the closest equity market value to that of the concept stock is chosen as the control firm. The fifth procedure matches each concept stocks with the firm that has the same age and the closest book-to-market ratio. The other eight procedures constrain the sample based on other characteristics such as delisting, exchanges, time periods, and IPOs.

ative earnings. To insure an appropriate comparison, both concept and control firms need to have non-negative earnings. The objective here is to analyze whether different returns could be earned by focusing on firms that were already experiencing positive earnings. The level of under-performance is dramatically less, being significant over only a portion of the 5 years following selection as a concept stock.

To examine the impact of exchange listings, we run separate comparisons for NYSE/AMEX and Nasdaq firms. Listed concept stocks actually outperform the control sample throughout the entire sample period. Results are insignificant, however. In contrast, Nasdaq firms have significant under-performance throughout.

In the next two analyses of Panel B we examine performance before and after 1981. Concept stocks significantly under-perform in the post-1981 period. This is similar to the results noted in the preceding paragraph and is a probably related to the increased number of NASDAQ firms found in the post-1981 period.

Finally, we examine the buy-and-hold performance of firms with equity issuances (IPOs or SEOs). Both IPO and non-IPO firms tend to under-perform relative to their control samples. However, the level of under-performance is generally insignificant in the IPO firms. Thus, the level of under-performance noted for concept stocks is not driven by the IPO phenomenon. We further broaden the definition of IPO concept stocks to include firms with ages of 2 years or younger. The results still hold. The differences of buy-and-hold returns between the (non-IPO) concept stocks and the control firms are -1.31% , -6.33% , -11.04% , -17.61% , and -13.76% for years 1–5, respectively. The first year's

difference is insignificant. The remaining differences are significant beyond the .001 level. In contrast to the results in Table 7, the results in subsamples (IX) and (X) indicate concept stocks with equity issuances actually perform better than their match sample. Concept firms without equity issuances under-perform from 10% to 22% in the long run.

4.3.3. *Have we only captured glamour or contrarian effect?*

It is well documented that glamour stocks earn lower subsequent returns than value stocks (see, e.g., La Porta et al., 1997). In addition, stocks that perform well in the past 3–5 years also earn lower subsequent returns (see, e.g., DeBondt and Thaler, 1985). Since concept stocks in general perform better than other firms in prior years, it could be argued that the “concept stock” effect that we have documented is simply driven by the glamour or the contrarian effect.

To examine this possibility more closely, we independently sort the set of concept stocks into terciles each year by (1) the book-to-market ratio and (2) past 3-year returns. The buy-and-hold returns are then calculated in each tercile. Panel A of Table 9 presents the results using the book-to-market ratio. Rank 1 includes concept stocks with the lowest book-to-market ratio in the previous year while rank 3 includes the ones with the highest ratio. Examining returns of both concept and control stocks across the three terciles confirm the glamour vs. value effect. Subsequent yearly returns are consistently higher as we move from the lowest book-to-market (glamour stocks) to the highest book-to-market (value stocks). The difference in returns between concept stocks and control firms, however, is consistently negative suggesting that there is clearly a concept stock effect that is independent of the glamour effect. Although this result is weaker for rank 3, overall, concept stocks have lower returns than control firms in all three ranks. It suggests that concept stocks under-perform even after we control for the glamour effect.

To test for contrarian effects, we repeat this exercise by replacing the book-to-market ratio with the past 3-year returns as the ranking criteria. Panel B of Table 9 indicates that the under-performance of control stocks is independent of the contrarian effect. Results of under-performance in concept stocks do not appear to be driven by the glamour or the contrarian effect.

4.4. *Determinants of success of concept stocks*

Although we have documented that on average, buying concept stocks is not profitable in the long run, some concept firms did seem to turn their ideas into reality. Put more precisely, the cross-section of 5-year buy-and-hold returns to concept stocks exhibits considerable cross-sectional variation. In this section, we examine via multivariate regression, whether the firm-specific variables identified in this research are useful in explaining this cross-sectional variation. Applying the Fama–MacBeth procedure, we run the regressions year by year and then use the time-series coefficients to calculate the significance of the estimates.

Results, presented in Table 10, indicate that smaller and Nasdaq firms are more likely to have lower returns once they are chosen as concept stocks.²⁵ This is consistent with the notion that smaller firms have higher information asymmetry and thus may experience

²⁵ Nasdaq stocks have insignificantly negative returns if we fail to control for industry effects.

Table 9

5-Year buy-and-hold returns (BHRs) of concept stocks and their matching firms sorted by the book-to-market ratios and the past 3-year returns

Year	Concept (%)	Control (%)	Diff (%)	<i>t</i> (Diff)	<i>p</i> -Value
<i>Panel A: The book-to-market ratio</i>					
<i>Rank: BV/MV1 (low)</i>					
1	11.57	13.87	−2.31	−1.67	(0.095)
2	17.06	22.42	−5.36	−2.44	(0.015)
3	29.73	34.46	−4.73	−1.00	(0.317)
4	43.40	56.43	−13.03	−2.77	(0.006)
5	64.62	72.88	−8.27	−1.56	(0.120)
<i>Rank: BV/MV 2</i>					
1	11.09	14.24	−3.15	−0.88	(0.378)
2	25.17	32.99	−7.82	−0.72	(0.471)
3	33.15	45.74	−12.59	−1.57	(0.117)
4	43.66	63.98	−20.32	−2.34	(0.020)
5	77.20	82.40	−5.19	−0.34	(0.731)
<i>Rank: BV/MV 3 (high)</i>					
1	19.74	21.41	−1.67	−0.30	(0.766)
2	26.32	36.39	−10.06	−1.17	(0.243)
3	52.69	61.01	−8.32	−0.44	(0.664)
4	74.88	94.79	−19.91	−0.90	(0.371)
5	85.48	130.77	−45.29	−1.76	(0.081)
<i>Panel B: The past 3-year returns</i>					
<i>Rank: Pr3yr 1 (low)</i>					
1	7.13	14.21	−7.08	−2.79	(0.005)
2	25.08	27.59	−2.51	−0.35	(0.729)
3	43.55	41.71	1.84	0.12	(0.903)
4	44.06	60.51	−16.44	−2.25	(0.025)
5	66.37	81.88	−15.51	−1.47	(0.143)
<i>Rank: Pr3yr 2</i>					
1	11.06	14.27	−3.21	−1.49	(0.137)
2	12.06	19.03	−6.97	−2.47	(0.014)
3	30.09	29.21	0.88	0.15	(0.879)
4	42.38	51.55	−9.17	−1.31	(0.190)
5	58.09	62.29	−4.20	−0.64	(0.525)
<i>Rank: Pr3yr 3 (high)</i>					
1	13.87	13.78	0.10	0.05	(0.958)
2	19.67	25.44	−5.78	−2.01	(0.045)
3	25.39	39.26	−13.87	−3.66	(0.000)
4	45.92	65.45	−19.53	−2.71	(0.007)
5	71.61	82.03	−10.42	−1.33	(0.184)

BHRs are calculated as the difference between the equal-weighted portfolio returns of concept stocks and control firms. “Diff” reports the cross-sectional difference of buy-and-hold returns between the concept stocks and the control firms. The robust *t*-statistics, *t*(Diff), are calculated using a two-sided test of no difference. *p*-Values are in parentheses.

more severe investor mis-valuation. The results also show that among concept stocks, those with higher R&D expenditures perform better than those with lower R&D expenses. This link between R&D and subsequent returns is consistent with the research of Lev and

Table 10
Determining the success of concept stocks

Explanatory variable	(1)	(2)	(3)	(4)	(5)
<i>Size, age, exchange, volume, and SEO variables</i>					
Firm age	−0.006 (0.141)		−0.002 (0.395)		
Log(book value)		0.051 (0.257)		0.071 (0.133)	
Nasdaq		−0.144 (0.384)		−0.311 (0.034)	−0.273 (0.074)
Trading volume		−1.395 (0.128)		−1.449 (0.142)	
SEO dummy	0.282 (0.012)	0.199 (0.040)	0.291 (0.008)	0.202 (0.042)	0.256 (0.017)
<i>Leverage, investment, advertising, and capital expenditure characteristics</i>					
Long-term debt	−0.45 (0.141)	−0.68 (0.053)	0.05 (0.910)	−0.37 (0.443)	0.09 (0.849)
R&D/BV	0.581 (0.205)	0.833 (0.031)	2.083 (0.008)	2.058 (0.008)	1.794 (0.012)
Adv/BV	2.797 (0.231)	2.897 (0.229)	1.137 (0.621)	1.388 (0.559)	1.256 (0.602)
Capital expenditure	−0.011 (0.947)	−0.028 (0.849)	−0.058 (0.674)	−0.071 (0.605)	−0.067 (0.629)
Book-to-market	0.320 (0.078)	0.213 (0.269)	0.265 (0.166)	0.112 (0.562)	0.249 (0.157)
Low market-to-sales dummy	−0.036 (0.672)	−0.010 (0.909)	−0.012 (0.894)	0.008 (0.929)	−0.011 (0.898)
High market-to-sales dummy	0.016 (0.816)	−0.024 (0.738)	0.082 (0.314)	0.061 (0.460)	0.059 (0.469)
<i>Profitability-related variables</i>					
Return on assets					0.484 (0.009)
Return on equity	0.399 (0.052)	0.321 (0.093)	0.496 (0.062)		
Positive earnings			0.163 (0.505)	0.181 (0.490)	
Intercept	0.419 (0.017)	0.288 (0.157)	−0.018 (0.958)	−0.046 (0.877)	0.216 (0.320)
Industry dummy			Yes	Yes	Yes
Average adjusted R^2	0.074	0.090	0.125	0.141	0.130

The Fama–MacBeth regressions are performed cross-sectionally each year and then the average of the time series of each coefficient is calculated. The dependent variable is the cumulative 5-year buy-and-hold return for each concept stock. Firm's market value is the market capitalization of common stock at calendar year-end. Firm age is defined as the difference between year of interest and the earliest year that the firm has traded stock price available in CRSP. Long-term debt (LTD) ratio is debt in current liabilities plus long-term debt divided by firm market size. Book value is total assets minus total liabilities and preferred stock. Firm book size is the natural logarithm of book value. Returns on assets is defined as operating income before depreciation divided by assets. Returns on equity is operating income before depreciation divided by the sum of book value and preferred stock. Nasdaq is a dummy variable equal to one if the firm stock trades in Nasdaq and zero if in NYSE/AMEX. Trading volume (as average turnover) is defined as the annual average of monthly trading volume divided by total shares outstanding. SEO dummy is equal to one if the firm has a positive stock issuance. Positive earnings is a dummy variable if returns on earnings is positive for the firm and zero otherwise. Industry dummy variables are constructed at the two-digit SIC level. High (Low) market-to-sales dummy is equal to one if the firm's market-to-sales ratio is at the top (bottom) 33% among concept stocks. p -Values (in parentheses) are associated with White robust standard errors.

Sougiannis (1996). We also find that concept stocks with equity issuances earn higher returns in the long run. This is consistent with the result in Table 8. We do not find any difference in performance among (market to sales) terciles of concept stocks themselves. Finally, the significantly positive coefficients of profitability-related variables indicate that profitable concept stocks are associated with higher future returns.

5. Summary and conclusions

The recent financial literature contains several interesting empirical analyses of selected categories of stocks and selected investment strategies. A heretofore-unaddressed category of stocks, commonly appearing in the financial press over the past three decades is “concept stocks”, typically identified as stocks with extremely high market to sales ratios. Using the intersection of the CRSP/Compustat universe, we define concept firms as those ranked between the 91st and 100th percentile of the market to sales ratio for each of the 33 years of our sample. Empirically, the identity of concept stocks is quite distinct from glamour stocks, IPOs, SEOs, or stocks identified by contrarian strategies.

Critics argue that concept stocks are grossly overvalued. Proponents argue that their characteristics and prospects elude traditional pricing models. Instead, it is argued that you have to buy the “concept” to appreciate these firms. The concept typically involves some explanation of why future earnings are promising for these firms. The debate over concept stocks is, thus, an empirical question that can only be resolved through an analysis of their characteristics and subsequent performance.

Our examination of these issues documents several key results: First, the industrial and financial characteristics of concept stocks have changed dramatically over time. While the obvious recent examples of concept stocks are internet and biotech stocks, the composition of concept stocks has shifted dramatically over the last three decades. The industries containing the most popular concept stocks evolve from oil and gas extraction in the 1960s and 1970s, to computer and office equipment in the 1980s, and to computer-related services in the 1990s. Second, the average relative valuation of the typical concept stock has risen dramatically over the 33 years of our analysis while the book-to-market ratio of concept stocks does not exhibit systematic changes. At the same time, the percentage of concept stocks with positive earnings has sharply declined; more than 95% have positive earnings near the beginning of our sample, less than 40% have positive earnings near the end. Consistent with street wisdom, concept stocks have higher levels of research and development and greater capital expenditures than comparison firms. Nevertheless, the long run performance of concept stocks is negative relative to control firms. This result holds for both Fama and French (1993) three-factor models and the buy-and-hold approach and is robust to extensive sensitivity analyses. Finally, after controlling for glamour, contrarian, and new equity effects, the under-performance of concept stocks remains significant.

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