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Contrarian Investment, Extrapolation, and Risk

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I. INTRODUCTION

For many years, stock market analysts have argued that value strategies outperform the market (Graham and Dodd, 1934). These value strategies call for buying stocks that have low prices relative to earnings, dividends, historical prices, book assets or other measures of value. In recent years, value strategies have attracted academic attention as well. Basu (1977); Jaffe, Keim, and Westerfield (1989); Chan, Hamao, and Lakonishok (1991); and Fama and French (1992a) have shown that stocks with high earnings price ratios earn higher returns. De Bondt and Thaler (1985, 1987) have argued that extreme losers outperform the market over the subsequent several years. Despite considerable criticism (Chan, 1988; and Ball and Kothari, 1989), their analysis has generally stood up to the tests (Chopra, Lakonishok, and Ritter, 1992). Rosenberg, Reid, and Lanstein (1984) show that stocks with high book relative to market values of assets outperform the market. Further work (Chan, Hamao, and Lakonishok, 1991; Fama and French, 1992a), has both extended and refined these results. Finally, Chan, Hamao, and Lakonishok (1991) show that a high ratio of cash flow to price also predicts higher returns. Interestingly, many of these results have been obtained for both the U.S. and Japan. Certain types of value strategies, then, appear to beat the market.

While there is some agreement that value strategies work, the interpretation of why they

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[1]University of Illinois, Harvard University, and University of Chicago, respectively. We are indebted to Eugene Fama, Kenneth French, K. C. Chan, Louis Chan, and Jay Ritter for helpful comments and Han Qu for outstanding research assistance. This paper has been presented at the University of California (Berkeley), the University of Chicago, the Massachusetts Institute of Technology, the National Bureau of Economic Research (Asset Pricing Group), New York University, Stanford University, and Tel Aviv University. The research was supported by the National Science Foundation, Bradley Foundation, Russell Sage Foundation, and the National Center for Supercomputing Applications, University of Illinois.

work is more controversial. Value strategies might work because they are contrarian to "naive"[2] strategies followed by other investors. These naive strategies might range from extrapolating past earnings growth too far into the future, to assuming a trend in stock prices, to overreacting to good or bad news, or to simply equating a good investment with a well-run company irrespective of price. Regardless of the reason, some investors tend to get overly excited about stocks that have done very well in the past, buy them up, and these "glamour" stocks become overpriced. Similarly, they overreact to stocks that have done very badly, oversell them, and these out-of-favor "value" stocks become underpriced. Contrarian investors bet against such naive investors. Because contrarian strategies invest disproportionately in stocks that are underpriced, and underinvest in stocks that are overpriced, they outperform the market (see De Bondt and Thaler, 1985).

An alternative explanation of why value strategies work, argued most forcefully by Fama and French (1992), is that they are fundamentally riskier. That is, investors in value stocks, such as high book to market stocks, tend to bear higher fundamental risk of some sort, and their higher average returns are simply compensation for this risk. This argument was also used by critics of De Bondt and Thaler (Chan, 1988; and Ball and Kothari, 1989) to dismiss the overreaction story. Whether value strategies work because they are contrarian to naive strategies or because they are fundamentally riskier remains an open question.

In this paper, we try to shed further light on the two potential explanations for why value strategies work. We do so along two directions. First, we examine more closely the predictions of the contrarian model. In particular, one natural version of the contrarian model argues that the overpriced glamour stocks are those which, first, have performed well in the past, and, second, are expected by the market to perform well in the future. Similarly, the underpriced out-of-favor or value stocks are those that have performed poorly in the past and are expected to continue to perform poorly. Value strategies that bet against those investors who extrapolate past performance produce superior returns. In principle, this version of the contrarian model is testable because past performance and expectation of future performance are two separate and

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[2]What we call "naive strategies" is also sometimes referred to as "popular models" (Shiller, 1984) and "noise" (Black, 1986).

separately measurable characteristics of glamour and value.

In this paper, past performance is measured using information on past growth in sales, earnings, operating income, and cash flow, and expected performance is measured by multiples of price to current earnings, operating income, and cash flow. We then examine the predictions of the contrarian model, namely that out-of-favor or value stocks indeed outperform glamour stocks. We start with simple one-way classifications of glamour and value that rely on measures of either past growth or expected future growth. We then move on to the more theoretically justified classifications in which glamour and value are defined using both past growth and current multiples. In addition, we compare past, expected, and future growth of glamour (and value) stocks to see if their expected growth rates are similar to past growth rates and higher (lower) than actual future growth rates, as our version of the contrarian model predicts. We show that a wide range of value strategies produce higher returns, and that the pattern of returns, and of past, expected, and actual growth rates are consistent with the contrarian model.

The second question we ask is whether value stocks are indeed fundamentally riskier than glamour stocks. To be fundamentally riskier, value stocks must underperform glamour stocks with some regularity, and particularly in the states of the world when the marginal utility of consumption is high. This view of risk motivates our tests. We look at the frequency of superior (and inferior) performance of value strategies, as well as at their performance in bad states of the world, such as extreme down markets and economic recessions. We also look at the betas and standard deviations of value and glamour strategies. We find little if any support for the view that value strategies are fundamentally riskier.

Our results raise the obvious question of how the higher expected returns on value strategies could have continued if such strategies are not fundamentally riskier?
We present some possible explanations that rely both on behavioral strategies favored by individual investors and on agency problems plaguing institutional investors.

The next section of the paper briefly discusses our methodology. Section III examines a variety of one variable measures of glamour and value, including book to market ratio, cash flow to price ratio, earnings to price ratio, and past growth in sales. It shows that virtually all contrarian strategies produce excess returns, and motivates our subsequent use of measures of past and expected growth in combination. Section IV then examines the performance and other

characteristics of theoretically superior contrarian strategies that are defined using both past growth and current multiples. It shows that theoretically motivated contrarian strategies produce higher returns than more ad hoc classifications, such as book to market. These value strategies outperform glamour strategies by 8 percent per year. Moreover, the superior performance of value stocks relative to glamour stocks does not diminish if we restrict our attention to the 50 percent or 20 percent largest stocks by market capitalization. Section V provides evidence that contrarian strategies work because they exploit the extrapolation mistakes reflected in stock prices. Specifically, the expected growth of glamour stocks relative to value stocks implicit in their relative multiples significantly overestimates actual future growth. Section VI examines risk characteristics of these value strategies and provides evidence that over longer horizons value strategies outperform glamour strategies almost always, and do particularly well in "bad" states of the world. This evidence provides no support for the hypothesis that value strategies are riskier. Finally, section VII attempts to interpret our findings.

II. METHODOLOGY

The sample period covered in this study is from the end of April, 1963, to the end of April, 1990. Some of our formation strategies require 5 years of past accounting data. Consequently, we look at portfolios formed every year starting at the end of April, 1968. We examine subsequent performance and other characteristics of these portfolios for up to 5 years after formation using returns data from CRSP and accounting data from COMPUSTAT (including the research file). The universe of stocks is NYSE and AMEX. Since we require 5 years of past data before including a company in the sample, the survival bias inherent in the way that COMPUSTAT adds companies to its data base is to a large extent avoided (Banz and Breen, 1986).

Within each of our groups such as deciles based on book-to-market ratios, we equally weight all the stocks. For each of our portfolios, we compute returns using a buy-and-hold strategy for years +1, +2,..., +5 relative to the time of formation. If a stock disappears from CRSP during a year, its return is replaced until the end of the year with the return on a corresponding size decile portfolio. At the end of the year, the portfolio is rebalanced and each surviving stock gets the same weight. (A stock that disappeared in the previous year is no longer

part of the portfolio.) We also computed the results for 50% and 20% of the largest firms in our universe. Such results are more indicative of realistic investment opportunities, especially for institutional investors. Moreover, focusing on larger firms avoids potential selection biases in the COMPUSTAT data base.

For most of our results, we present size-adjusted returns. To adjust for size, we first identify, for every stock in the portfolio, its size decile at the formation time. We then construct a size reference portfolio so that for every stock in the original portfolio we have a benchmark which is its size reference portfolio. At the end of each year, we recompute the market capitalization for each stock and update its size affiliation to obtain a more current size benchmark. In computing the return on the benchmark portfolio we assume an annual buy-and-hold strategy. The annual size-adjusted return on the original portfolio is then computed as the return on that portfolio minus the return on the size reference portfolio.

In addition to returns for the various portfolios, we compute growth rates and multiples for accounting measures such as sales, earnings, cash flow and operating income. All accounting variables are taken from COMPUSTAT. Earnings are measured before extraordinary items, cash flow is defined as earnings plus depreciation, and operating income is defined as earnings before interest, taxes, and depreciation.

Let us illustrate our procedure for computing growth rates using the case of sales. To compute the growth of sales in year -3 relative to formation, we consider a portfolio that invests $1 in each stock, and look at the sales generated by this portfolio in years -4 and -3, and use the percentage change as our growth measure. In this fashion, we compute the growth in sales for every year prior and post formation. The 5-year growth rates we present are annual geometric average growth rates. This procedure is appealing because it computes growth rates in accounting measures in the same way as stock returns are computed, i.e., it gives each company the same weight at the start of each year. Moreover, this portfolio approach to calculating growth rates avoids the problems with outliers and with negative base year values present in the more traditional approach where growth rates are computed for each stock and then averaged.

Finally, we compute several accounting ratios, such as cash flow to price and earnings to price. These ratios are also used to classify individual stocks into different portfolios. For these classifications, we consider only stocks with positive ratios of cash flow to price or earnings to

price because negative ratios cannot be interpreted as reflecting expected growth rates. For purposes other than classifying individual stocks into portfolios, these ratios are computed for the entire equally-weighted portfolios, without eliminating negative values. For example, we compute the total cash flow to price ratio for each stock and then take the average for the relevant sample. This strategy gives us the cash flow per $1 invested in a portfolio where each stock receives the same weight. Negative ratios for individual stocks do not present any special problems.

III. SIMPLE GLAMOUR AND VALUE STRATEGIES

Table 1 presents the returns on a strategy that has received a lot of attention recently (Fama and French 1992a), namely the book to market strategy. We divided the universe of stocks annually into book to market deciles, where book value is taken from COMPUSTAT for the end of the previous fiscal year, and market value is taken from CRSP as the market value of equity at portfolio formation time. In general in this paper, we focus on long horizon returns (of up to 5 years) on various strategies. The reason for looking at such long horizons is that we are interested in performance of alternative investment strategies over horizons suitable for long term investors. Moreover, we assume annual buy and hold periods in contrast to monthly buy and hold periods assumed in most previous studies. Because of various market microstructure issues as well as execution costs, our procedure produces returns that are closer to those that investors can actually capture.

In Panel A of Table 1, we present the size-adjusted returns for years 1 through 5 after the formation (AB1 through AB5), the average size-adjusted annual return (AAB), the size-adjusted 5 year return (CAB5), and the compounded 5 year raw return (C5). The numbers presented are the averages across all formation periods in the sample. The results confirm and extend the results established by Rosenberg et al (1984), Chan et al (1991), and Fama and French (1992a). On average over the post-formation years, the low BM (glamour) stocks have an abnormal return of -4.3 percent and the high BM (value) stocks have the abnormal return of 3.5 percent, a difference of 7.8 percent per year. The extra return on value stocks relative to glamour stocks is 4.5 percent in the first year, 8.3 percent in the second year, 6.7 percent in the third year, 9.9 percent in the fourth year, and 9.8 percent in the fifth year. If portfolios are held with the

limited rebalancing described above, then cumulatively value stocks outperform glamour stocks by 38.7 percent over years 1 through 5. Without adjusting for size, glamour stocks earned a five year return of 56.5 percent versus 112.1 percent for value stocks. There is little doubt that, during this time period, the BM value strategy substantially outperformed the glamour strategy.

The real question is what does the BM ratio really capture? Unfortunately, many different factors are reflected in this ratio. A low BM may describe a company with a lot of intangible assets, such as R&D capital, that are not reflected in the accounting book value because R&D is expensed. A low BM can also describe a company with attractive growth opportunities that do not enter the computation of book value, but do enter the market price. Also, a natural resource company, such as an oil producer without good growth opportunities but with high temporary profits, might have a low BM after an increase in oil prices. A stock whose risk is low and future cash flows are discounted at a low rate would have a low BM as well. Finally, a low BM may describe an overvalued glamour stock. The point here is simple: book to market is not a "clean" variable uniquely identifiable with economically interpretable characteristics of the firms.

The more important of such economically interpretable characteristics are the market's expectations of future growth and the past growth of these firms. To proxy for expected growth, we use multiples of various measures of profitability to price, so that firms with lower multiples have higher expected growth. The idea behind this is Gordon's formula that $C/P = r - g$, where C is cash flow, P is price, r is discount rate and g is the expected growth rate of cash flow. A similar formula applies to dividends, earnings, and operating income, except that their own respective expected discount and growth rates should be used. According to this formula, holding discount rates constant,[3] a high C/P firm has a low expected growth rate of cash flow, while a low C/P firm has a high expected growth rate of cash flow, and similarly for the ratio of dividends to price (DP), or cash flow to price (CP), and of operating income to price (OP).[4] In addition

[3]In section VI, we compare risk characteristics, and hence appropriate discount rates, of the various portfolios.

[4]Because of leverage, operating income is not a precise measure of cash flow that accrues to shareholders. Consequently, we use OP multiples across firms as only a rough indicator of differences in expected growth of operating income.

to expected growth rates, we look at actual past growth rates of sales (SG), earnings (EG), operating income (OG) and cash flow (CG). Because the book to market ratio does not disentangle the past and the future growth, we look at variables that estimate the past and the future growth separately.

Panel B of Table 1 presents the current multiples and past growth rates of BM portfolios. The various multiples are in general much higher for value stocks than for glamour stocks. For example, the extreme glamour stocks have a cash flow to price ratio of .059, which is about one-third as large as this ratio for extreme value stocks (.172). This indicates that the expected growth in cash flow is much higher for glamour stocks than for value stocks, or, put differently, that glamour stocks are 3 times more expensive per dollar of cash flow than value stocks. But in some cases, the most extreme value stocks have lower multiples than the less extreme value stocks. For example, the EP ratio of the extreme BM value portfolio is the lowest. This might be explained by the fact that the BM value portfolio contains many stocks whose earnings are temporarily depressed, but are expected to recover at least partially. The high expected growth rate of earnings of high BM stocks suggests that BM is not an ideal way to define a contrarian strategy. Looking at five year past growth of BM deciles shows that low BM (glamour) stocks have higher past growth rates than high BM (value) stocks. For example, the past growth rate of cash flow is 26.9 percent per year higher for glamour stocks. The same pattern works for operating income (see also Fama and French, 1992b). The results on past growth suggest that the BM strategy is similar to a contrarian strategy in that it picks stocks with low past growth and avoids stocks with high past growth.

In light of the ambiguity of the interpretation of BM, we move on to measures of expected future growth rates and past growth rates as perhaps more direct ways to identify glamour and value stocks. Table 2 presents the results of sorting on the ratio of cash flow to price (CP). High CP stocks are identified with value stocks because their growth rate of cash flow is expected to be low, or, alternatively, their prices are low per dollar of cash flow. Conversely, low CP stocks are glamour stocks. On average, over the 5 post-formation years, first decile CP stocks have an abnormal return of -4.9 percent per annum, whereas the tenth decile CP stocks have an abnormal return of 3.9 percent per annum, for a difference of 8.8 percent. Over the five year horizon, the difference in cumulative abnormal returns between lowest CP and highest CP

portfolios is 42.9 percent, and that in cumulative raw returns is 95.1 percent. Sorting on CP is thus a more effective value strategy by itself than sorting on book to market. If nothing else, this result shows that there is nothing unique about BM as the basis for either a contrarian value strategy or for a high expected return strategy.

The characteristics of CP deciles are similar to those of BM deciles. Multiples basically line up with BM and increase with CP deciles. The results on past growth are also in general consistent with glamour stocks having a superior past performance relative to value stocks, although CP decile 1 stocks do not have the highest past growth. This suggests that the low CP decile contains many stocks that have had low growth in the past but are expected to recover, which are not the stocks which a contrarian strategy would pick out. Sorting on CP alone thus does not give us a strategy that is always contrarian to extrapolation either.

An alternative popular multiple is the earnings price ratio, EP. Table 3 presents the results for EP. On average, over the 5 post-formation years, first decile EP stocks have an abnormal return of -3.5 percent, and tenth decile EP stocks have an abnormal return of 1.9 percent, for an average difference of 5.4 percent. Over the five year horizon, this difference in abnormal returns cumulates to 26.3 percent, whereas the cumulative difference in raw returns is 67.1 percent. Low EP stocks underperform high EP stocks by a fairly wide margin, although the difference is not as large as that between extreme BM or CP deciles. One possible reason for that is that earnings are very noisy and often negative, which makes EP a poor proxy for identifying glamour and value stocks.

An alternative way to get at glamour and value is to classify stocks based on past growth. The extrapolation story, as well as the evidence discussed above, suggests that stocks with high past growth are typically glamour stocks, and stocks with low past growth are out-of-favor or value stocks. We measure past growth by growth in sales, GS, which is less volatile and less often negative than either growth in cash flow or growth in earnings, particularly for stocks in the extreme portfolios that we are most interested in. Still, sorting stocks into deciles by past growth rates of sales is somewhat complicated. To reduce the noise from year-to-year sales growth volatility, our classification of stocks into GS deciles is based on average rank of their sales growth, rather than the raw growth number. Specifically, for each company for each of years -1, -2, ..., -5 prior to formation we calculated the growth of sales in that year. Then, for each year,

we rank all companies by growth in sales for that year. For each company, we then compute its weighted average rank, giving the weight of 5 to its growth rank in year -1, the weight of 4 to its growth rank in year -2, etc. Finally, we form deciles based on each stock's weighted average growth of sales rank. This procedure is a crude way to both pick out stocks with consistently high past growth in sales, and to give greater weight to more recent sales growth in ranking stocks.[5]

Table 4 presents the results for the GS strategy. On average, over the 5 post-formation years, the low GS strategy earns an abnormal return of 2.2 percent, and the high GS strategy earns the abnormal return of -2.4 percent. The cumulative difference in size-adjusted returns over five years is 22.7 percent, and that in raw returns is 61.6 percent. The value strategy outperforms the glamour strategy, on average, in each of the 5 post-formation years. These magnitudes are not as dramatic as those for the BM and CP strategies, but show clearly that a GS-based strategy can predict returns. Note that when we confine ourselves to the largest 50% of all firms in Table 8, the GS strategy works as well as the BM strategy.

An examination of the characteristics of GS decile portfolios reveals several interesting results. First, low GS stocks have an annualized sales growth of -3.5 percent over 5 years prior to formation, compared to 12.5 percent for high GS firms. The multiples generally rise as GS rises, except for decile ten where the multiples typically fall. Some of the fastest past growth stocks are expected to slow down and hence have relatively low multiples, which suggests that sorting on GS alone is, again, not an ideal contrarian strategy. The pattern of other past growth measures across GS deciles largely follows the pattern of GS. In sum, sorting on GS alone gives us a strategy that works as a value strategy, but does not necessarily coincide with an ideal contrarian strategy. This is exactly what we would expect.

The results in this section suggest several conclusions. First, a variety of value strategies, based on both multiples and past growth rates, produce superior returns. There is nothing special about the book to market strategy or any other individual measure of value. Second, the one way classification strategies do not appear to be the best way to identify glamour and value

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[5]We have also tried a procedure in which we did not give the growth rate in more recent years a higher weight in the ranking, and obtained very similar results.

stocks, since they often bunch true glamour and value stocks with temporary winners and losers. For example, low EP stocks, which are supposedly glamour stocks, include many stocks with temporarily depressed earnings. These results point to the need for a theoretically better definition of glamour and value, which takes account of both past growth and expectations of future growth.

IV. ANATOMY OF A CONTRARIAN STRATEGY

Performance of Contrarian Strategies

For market participants to extrapolate the performance of a given stock, they must expect its future performance to be similar to past performance. This means that a glamour stock would be a stock with high growth in the past and expected continued high growth in the future. In this section, we continue to associate high multiples of prices to earnings (dividends, operating income, or cash flow) with high expected growth rate. Thus a glamour stock must have both high past growth and a high multiple, not just one of these. A glamour stock must be distinguished from a temporary loser, which had low growth in the past but is expected to recover and hence has a high multiple. A glamour stock must also be distinguished from a temporary winner, which had high growth in the past but is expected to slow down and hence has a low multiple. A value stock must have had low growth in the past and be expected by the market to continue to grow slowly, giving it a low multiple. The principle behind the contrarian strategy is that glamour stocks are overpriced and value stocks are underpriced given their risk characteristics, and hence an investor should buy value stocks and sell glamour stocks. The question is: do such "theoretically motivated" contrarian strategies work better?

Table 5 presents the results for the strategy that sorts on both GS and CP. Since we are sorting on two variables, sorting stocks into deciles on each variable is impractical. Accordingly, we independently sort stocks into three groups (bottom 30%, middle 40% and top 30%) by GS and by CP, and then take intersections resulting from the two classifications. Because the classifications are done independently, extreme glamour and value portfolios (high GS, low CP and low GS, high CP) contain greater than average numbers of stocks since GS and CP are negatively correlated. The extreme glamour portfolio has the highest GS and the lowest CP rank, and the extreme value portfolio has the lowest GS and the highest CP rank. These portfolios are

listed in the first and last columns of Table 5.

In an average post-formation year in this sample, the glamour portfolio had an abnormal size-adjusted return of -3.3 percent, and the value portfolio had the abnormal return of 5.4 percent, for a difference of 8.7 percent per year. In no post-formation year is the average difference in returns between the extreme portfolios below 8 percent! Over the five post-formation years, the cumulative difference in abnormal returns is 46 percent, and the cumulative difference in raw returns is 99.9 percent. This difference in returns between the value and the glamour strategies seems to us to be very large. It is larger, in particular, than the difference predicted by the BM strategy or by the CP strategy alone. Interestingly, both CP and GS contribute a great deal of explanatory power in these bivariate classifications. For example, low CP stocks with low past sales growth, which we don't define as glamour stocks, yield a positive abnormal return of .005, but low CP stocks with a high past sales growth, which we do define as glamour stocks, have a future abnormal return of -.029.

Table 6 presents the results for a classification using both past growth rate in sales and the earnings to price ratio. The average difference in returns over the 5 year period between the two extreme portfolios is now 7.7 percent a year, which cumulatively amounts to 38.6 percent over 5 years in size-adjusted returns and 104.2 percent in raw returns. The EP X GS strategy works much better than either the EP alone or the GS alone strategy, although not quite as well as the CP X GS strategy. By comparing these returns to the low EP low GS group, and the high EP high GS group, it is clear that both EP and GS contribute to a better selection of glamour and value stocks. Moreover, even though the results from sorting on EP alone were not very strong, the combination of EP and GS works almost as well as CP and GS, which suggests that in combination with a variable that distinguishes past losers and past winners, such as GS, the EP variable in fact separates glamour stocks from value stocks successfully.

Table 7 presents returns and other characteristics for portfolios classified by BM and growth in sales. The results show that growth in sales has significant explanatory power for returns even after sorting by BM. For example, within the set of firms whose BM ratios are the highest, the average difference in returns between the low sales growth and high sales growth subgroups is over 3% per year (4.1% vs. .9%). A similar result holds for the other two groups sorted by BM. Note that these results do not appear to be driven by the role of the superimposed GS

classification in creating a more precise partition of the firms by BM. The BM ratios across GS subgroups are not very different.

In summary, the results of this section have established two propositions. First, the amounts by which theoretically justified value strategies outperform glamour strategies are extremely large. In many cases, they are on the order of 7 to 8 percent per year, and persist for several years. Given the failure of standard fundamental risk measures to explain even small differences in returns, it is hard to believe that 7 to 8 percent a year can be explained by risk. Second, the results suggest that strategies explicitly constructed to be contrarian to extrapolation of past growth produce higher abnormal returns than more ad hoc value strategies, such as that based on book-to-market. This result suggests that value strategies might indeed work because they are contrarian, rather than for some other reason.

Do these results apply as well to large stocks?

One objection to this analysis is that, even though we corrected the returns for size, the superior returns of value stocks over glamour stocks might come from the smaller stocks. Larger firms, however, are of greater interest for implementable trading strategies, especially for institutional investors. These firms are more closely monitored, and hence might be more efficiently priced. Moreover, various market microstructure biases in CRSP tapes and selection biases in COMPUSTAT tapes should not be an issue with larger stocks.

Table 8 presents the summary of the previous analysis for the largest 50 percent of our firms. Our previous results still hold for every method of sorting stocks into glamour and value, and Table 8 illustrates that for GS, CP, CP X GS, BM, EP, and EP X GS. For the BM classification, the average difference in returns between glamour and value during the post-formation period is 6.7 percent per year. This difference for the CP X GS classification is 8.7 percent per year, which is the same as that obtained for all stocks. For the EP X GS classification, the difference in average returns is 8.3 percent per year.

We have also done the analysis for the largest 20 percent of the stocks, which effectively mimics the S&P 500, and got a very similar spread of returns between glamour and value stocks. The conclusion is clear: our results apply to the largest stocks as well.

Regression Analysis

Previous analysis has identified a variety of variables that can define glamour and value portfolios. In this section, we ask which of these variables are significant in a multiple regression. Table 9 presents the results of regressions of raw returns on the characteristics of stocks that we have identified. Recall that, in our analysis, we have 22 portfolio formation periods. We run regressions separately for each post-formation year, starting with +1 and ending with +5. Thus, for post-formation year +1, we run 22 separate cross-sectional regressions in which the dependent variable is the annual return on stock i and the independent variables are characteristics of stock i. Then using the Fama-MacBeth (1973) procedure, the coefficients for these 22 cross-sectional regressions are averaged and the t-statistics are computed. We similarly run 22 regressions for year +2, +3, +4 and +5 after the formation. The results presented in Table 9 are for the year +1.

We use the ratios of cash flow to price and of earnings to price in the regression analysis. However, for many stocks these ratios are negative, and hence cannot be plausibly interpreted as expected growth rates. We deal with this problem in the same way as Fama and French (1992a). Specifically, we define variables CP+ and EP+ which are equal to zero when CP and EP are negative, and are equal to CP and EP when they are positive. We also include in the regressions dummies, called DCP and DEP, which take the value of 1 when CP and EP are negative, respectively. This approach presents a crude way to treat observations with negative EP and CP differently than observations with positive EP and CP.

The first result emerging from Table 9 is that, taken separately, each of GS, BM EP and CP, although not SIZE, have a statistically significant predictive power on returns. These results are in line with Fama and French (1992a), although on a stand alone basis CP and not BM is the most significant variable. When we use the dependent variables in combination, the weakness of BM relative to CP, EP and GS begins to emerge, and its coefficient drops significantly. For example, when GS, CP and BM are included in the same regression, the first two are significant, but BM is not. Similarly, when GS, EP and BM are included in the same regression, EP and GS are significant, but BM is not. The variables that stand out in multiple regressions are GS and CP, the value measures stressed in this paper.

V. A TEST OF THE EXTRAPOLATION MODEL

So far we have shown that strategies contrarian to extrapolation earn high abnormal returns relative to the market and to extrapolation strategies. We have not, however, provided any direct evidence that extrapolation is indeed what characterizes glamour and value stocks. In this subsection, we provide such evidence. The essence of extrapolation is that investors are excessively optimistic about glamour stocks because they tie their expectations of future growth to past growth, and excessively pessimistic about value stocks for the same reason. But if investors make mistakes, these mistakes can presumably be detected in the data. A direct test of extrapolation, then, is to look directly at actual future growth rates and to compare them to the past growth rates and to the expected growth rates as implied by the multiples.

The information on past growth rates of sales, earnings, operating income and cash flow has been provided already. Future growth rates of the same variables can be computed in a similar fashion for years +1, +2, ..., +5, and for average growth. We can also compute the difference in past or future growth rates between glamour and value stocks. To estimate expected growth rates, we come back to Gordon's formula, which, for cash flow, takes the form, $C/P = r - g$, where C/P is the ratio of cash flow to price, r is the discount rate of cash flow, and g is the expected growth rate of cash flow. Using this formula, the difference between expected growth rates of cash flow of a glamour and a value stock is just the difference in cash flow to price ratios of these two stocks, assuming that their discount rates are the same, which we do for the moment. Similarly, we proxy for the differences in expected growth rates of earnings and operating income by the differences in earnings to price and operating income to price ratios.[6] The ratio of sales to price does not have the interpretation of an expected growth rate. Thus, for cash flow, earnings, and operating income, we have a proxy for the difference in expected growth rates between value and glamour based on differences in respective multiples.

Table 10 presents the results for two classifications of stocks, one based on BM and one based on GS X CP. Starting with BM, the following patterns emerge from the Table. First, as we know already, the past growth of glamour stocks by any measure is much faster than that of

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[6]Recall that operating income does not measure the cash flow accruing to shareholders, and hence OP is not as theoretically adequate a variable in this analysis as CP.

value stocks. Second, the expected growth rate of glamour stocks is usually higher than that of value stocks, although the difference in expected growth rates is not as high as that of past growth rates. For example, cash flow of glamour stocks has grown 26.9 percent faster than cash flow of value stocks, but is expected to grow only 11.3 percent faster in the future. Also, operating income of glamour stocks is expected to outgrow that of value stocks by almost as much as it did in the past. In contrast, while earnings of glamour stocks have grown much faster than earnings of value stocks in the past, the market expects them to grow 2.5 percent slower in the future. Market participants thus expect some, but far from complete, convergence of growth rates between glamour and value stocks.

The most striking result comes from the comparison of these expected growth rates to actual growth rates. The latter reveal clearly, that, contrary to the market's expectations, during the post-formation years, glamour stocks did not grow faster than value stocks. For example, while cash flow of glamour stocks was expected to grow 11.3 percent faster, it actually grew 3 percent slower. While operating income was expected to grow 22.6 percent faster for glamour stocks, it actually grew .4 percent slower. Most remarkably, while earnings of glamour stocks were expected to grow 2.5 percent slower than those of value stocks, in actuality they grew 38.6 percent slower per year. The expected growth rates show that market participants expect glamour stocks to outgrow value stocks in the future, though not by as much as they have in the past, and price them accordingly. Contrary to investors' expectations, however, there is little persistence in the growth rates. Given their expectations, investors are disappointed in the performance of glamour stocks relative to out-of-favor stocks. The results using the CP X GS classification present a very similar picture. Again, glamour stocks have outgrown value stocks in the past judging by any measure, including sales, earnings, operating income and cash flow. The expectations of relative future growth rates are, if anything, even more optimistic than the difference between past growth rates would suggest. For example, cash flow of glamour stocks grew 15.8 percent faster than that of value stocks, but, judging by the multiples, is expected to grow 19.9 percent faster per year, and similarly for earnings and operating income. In practice, glamour stocks indeed grow faster than value stocks, but not nearly as much faster as expected. For example, the cash flow of glamour stocks grows only 2.7 percent faster per year than that of value stocks, compared to the market's expectation of a difference of 19.9 percent. Similarly, the

difference in growth rates of earnings is negligible, even though the market expects the earnings of glamour stocks to grow 6 percent faster. This result is very similar to that for the BM classification. The market expects a much higher future growth rate from glamour than from value stocks, and hence prices glamour stocks much higher than value stocks relative to their earnings, cash flow, etc. In fact, glamour stocks do not grow nearly as fast relative to value stocks as the market expects, disappointing market participants.

One other interesting observation emerges from this comparison of expected and actual future growth rates using the GS X CP classification. That is, the difference in the growth rates between glamour and value stocks in the first year after the portfolio formation is large, particularly looking at earnings and operating income. This difference however shrinks rapidly over time, and in many cases the growth rate eventually becomes higher for value stocks. Similarly, if we compare the future growth in sales to past growth, we see the slow deterioration of the relative performance of glamour stocks in all classifications. At the same time, if we look at earnings, glamour stocks sometimes take a bath relative to value stocks right away. This evidence suggests that according to some measures the market's belief about the continued superior growth of glamour stocks is valid in the short run, even though for all measures the market is too optimistic about glamour stocks in the long run.

In summary, the evidence in Table 10 is supportive of the extrapolation model. The glamour stocks have historically grown fast in sales, earnings, cash flow, and operating income relative to the value stocks. Market participants in general expect these differential growth rates to continue, and in some cases to widen, and price glamour stocks accordingly. In the short run, their expectations of continued superior growth of glamour stocks is borne out according to some growth measures, though for other growth measures the forecasts are too optimistic even in the short run. However, in the long run, the evidence shows quite clearly that growth rates of glamour stocks either converge to the growth rates of value stocks, or even overshoot them and become lower. This table suggests, then, that forecasts tend to be tied to past growth rates, and at the same time tend to be far too optimistic for glamour stocks relative to value stocks. This, of course, is precisely what the extrapolation model would predict. In this respect, the evidence in Table 10 goes significantly beyond the customary evidence on returns in that it shows a relationship between the past, the forecasted, and the actual future growth rates that is largely

consistent with the predictions of the extrapolation model.

VI. ARE CONTRARIAN STRATEGIES RISKIER?

Two alternative theories have been proposed to explain why value strategies produce higher returns. The first theory says that they do so because they are contrarian to extrapolation. Section IV has produced evidence suggesting that indeed value strategies constructed as contrarian strategies produce higher returns than ad hoc value strategies. Section V further showed that investors appear to be extrapolating the past, even though the future does not warrant such extrapolation. The second explanation of the superior returns to value strategies is that they expose investors to greater systematic risk. In this section, we test this theory directly.

Value stocks would be fundamentally riskier than glamour stocks if, first, they underperform glamour stocks in some states of the world, and second, those are on average "bad" states, in which the marginal utility of consumption is high, making value stocks unattractive to risk-averse investors. This simple theory motivates our empirical approach.

To begin, we look at the consistency of performance of the value and glamour strategies over time and ask how often value underperforms glamour. We then check whether the times when value underperforms are recessions, times of severe market declines or otherwise "bad" states of the world in which the marginal utility of consumption is high. These tests do not provide much support for the view that value strategies are fundamentally riskier. Finally, we look at some additional standard measures of risk, such as beta and the standard deviation of returns, to compare value and glamour strategies.

Table 11 presents the results on the consistency of the performance of the value strategy relative to the glamour strategy. We consider differences in returns between deciles (1,2) and (9,10) for GS, (9,10) and (1,2) for CP and BM, and between groups (3,1) and (1,3) for GS x CP over 1, 3, and 5 year holding horizons starting each year in the sample (1968, 1969, etc). The results in Table 11 are based on raw returns. The results show that value strategies outperform glamour strategies quite consistently. Using a 1 year horizon, value outperformed glamour in 13 out of 22 years using GS to classify deciles, in 17 out of 22 years using CP, in 19 out of 22 using CP X GS, and in 17 out of 22 using BM. As we use longer horizons, the consistency of performance of the value strategy relative to the glamour strategy increases. Over a 5 year

horizon, the value strategy does worse than glamour in only 2 periods using the GS classification, and in NO periods using the CP, GS X CP, or BM classifications. In this sample, over the 5 year horizon, the value strategy was completely safe relative to the glamour strategy.

One could perhaps object to the raw return analysis since there are differences in market capitalization between value and glamour stocks, and so the size effect could be driving the results. Table 12 replicates the results in Table 11 using size-adjusted returns. Again, we see inferior performance of the value strategy in only a few cases using the one year horizon, and in no instances using the 5 year horizon unless GS is used as the sole classifier. The GS X CP strategy, which is our preferred contrarian strategy, picks out a portfolio of value stocks that always outperforms the portfolio of glamour stocks over a 5 year horizon. Incidentally, this consistency result holds up also for both the top 50 percent and the top 20 percent of stocks by market capitalization.

Given that value stocks underperform infrequently, do they at least underperform in recessions, when the marginal utility of consumption is high? According to the NBER, there were four notable recessions during our sample period: a mild one Dec 1969- Nov 1970, a very deep one Nov 1973- March 1975, and also significant ones Jan 1980- Jul 1980 and Jul 1981- Nov 1982. An examination of Table 11 shows that the value strategy did about the same or somewhat better than glamour just before and during the 1970 recession, did much better around the severe recession of 1973-1975, did somewhat though not a lot worse in 1979-1980, and did significantly better in 1981-1982. It is implausible to conclude from this that value strategies do particularly badly in recessions, when the marginal utility of consumption is especially high.

A second way to look at precisely the same question is to compare the performance of value and glamour portfolios in the worst months for the stock market as a whole. Table 13 presents the performance of our decile portfolios in each of 4 states of the world; the 25 worst stock return months in the sample based on the equally-weighted index, the remaining 88 negative months other than the 25 worst, the 122 positive months other than the 25 best, and the 25 best months in the sample. The results in this table are clear. Using every single classification, the value portfolio outperformed the glamour portfolio in the market's worst 25 months. For example, using the GS X CP classification, the value portfolio lost an average of 8.6 percent of its value in the worst 25 months, whereas the glamour portfolio lost 10.3 percent of its

value. Similarly, using every single classification scheme, the value portfolio outperformed the glamour portfolio and the index in the months in which the index declined. Using the GS X CP classification, the value portfolio lost 1.5 percent in the months when the index declines, compared to 2.9 percent for the glamour portfolio, and 2.3 percent for the index itself. So the value strategy clearly does better when the market falls. The value strategy performs most closely to the glamour strategy in the 122 positive months other than the best 25. In the very best months, the value strategy significantly outperforms the glamour strategy and the index, but not by as much as it does when the market falls sharply. Overall, the value strategy appears to do somewhat better than the glamour strategy in all states and significantly better in some states. If anything, the superior performance of the value strategy is skewed toward negative return months rather than positive returns months. The evidence in Table 13 thus shows that the value strategy does not expose investors to greater downside risk.

We have already shown that value rarely underperforms glamour for horizons of 1 year or more and that the few instances when it does underperform do not typically coincide with recessions. We have also shown that the relative performance of the value strategy is not worse in "bad" states as defined by large stock market declines. On the other hand, perhaps there is still a positive relation between the relative return on the value strategy and the degree of prosperity in the economy. Investigating this relation is akin to the approach taken by various APT researchers seeking to give their "factors" a basis in economic theory.

Tables 14 and 15 provide numbers analogous to those in Table 13 except now the states of the world are realizations of real GNP growth and changes in the unemployment rate. The data are quarterly, so that we have 88 quarters in the sample. These quarters are classified into 4 states of the world; the worst 10 quarters, the next worst 34 quarters, the best 10 quarters, and the next best 34 quarters. The quarterly returns on the various glamour and value portfolios are then matched up with the changes in macro variables for one quarter ahead, since evidence indicates that the stock market leads these variables by approximately one quarter. Average quarterly returns for each portfolio are then computed for each state.

The results in Tables 14 and 15 mirror the basic conclusions from Table 13; namely, that the value strategy is not fundamentally riskier than the glamour strategy. For every classification scheme, the value strategy performs at least as well as the glamour strategy in each of the 4 states

and substantially better in most states. Unlike the results in Table 13, there is some tendency for the relative returns on value to be higher in good states than in bad states, especially for extreme good states. Roughly speaking, value stocks could be described as having higher up betas and lower down betas than glamour stocks with respect to economic conditions. Importantly, while the value strategy does disproportionately well in extreme good times, its performance in extreme bad times is also quite impressive. Performance in extreme bad states is often the last refuge of those claiming that a high return strategy must be riskier, even when conventional measures of risk such as beta and standard deviation do not show it. Overall, the evidence indicates some positive relation between relative performance of the value strategy and measures of prosperity, but there are no significant traces of a conventional asset pricing equilibrium in which the higher returns on the value strategy are compensation for higher fundamental risk.

Finally, Table 16 presents some summary risk characteristics of the decile portfolios using our four classifications. These risk measures are calculated during the post-formation period using annual measurement intervals. For the extreme value and glamour portfolios especially, the pre-formation periods exhibit unusual behavior and hence might result in biased risk measures (Ball and Kothari, 1989). For each of our portfolios, we have 22 annual observations on its return in the year following the formation, and hence can compute the standard deviation of returns. We also have corresponding returns on the value-weighted CRSP index and the risk free asset, and hence can calculate a beta for each portfolio.

First, the betas of value portfolios with respect to the value weighted index tend to be about .1 higher than the betas of the glamour portfolios. As we have seen earlier, the high betas probably come from value stocks having higher "up" betas, and that if anything the superior performance of the value strategy occurs disproportionally during "bad" realizations of the stock market. Even if one takes an unreasonably strong pro-beta position, the difference in betas of .1 can explain the difference of returns of perhaps up to 1 percent per year, and surely not 8 percent that we find. The evidence on beta thus completes our findings that systematic risk, no matter how measured, cannot explain the findings of this paper.

Table 16 also presents average annual standard deviations of the decile portfolio returns. The results show that value portfolios have somewhat higher standard deviations of returns than glamour portfolios. Using the CP X GS classification, the value portfolio has an average

standard deviation of returns of 24.1 percent relative to 21.6 for the glamour portfolio. Closer examination reveals that these differences in standard deviations may just be related to the differences in betas we found or else to the differences in market capitalization of the firms in the different portfolios. Judging from the average standard deviation of size-adjusted returns, the value strategy looks no riskier than the glamour strategy, although both are riskier than the more middle-of-the-road strategies. Fama and French (1992b) obtain similar results for the BM strategy. Overall, it is hard to believe that the small differences in standard deviations that we are finding can explain the 8 percent per year difference in average returns.

VII. SUMMARY AND THE INTERPRETATION OF THE FINDINGS

The results in this paper establish (in varying degrees of detail) three propositions. First, many different investment strategies that involve buying out-of-favor (value) stocks outperform glamour strategies and the market. Second, the likely reason that these value strategies work so well relative to the glamour strategies is the fact that the actual growth rates of earnings, sales etc of glamour stocks relative to value stocks are much lower than they were in the past, or as the multiples on those stocks indicate the market expects them to be. That is, market participants appear to consistently overestimate future growth rates of glamour stocks relative to value stocks. Third, using conventional approaches to fundamental risk, value strategies appear to be less risky than glamour strategies. Reward for bearing fundamental risk does not seem to explain higher average returns on value stocks than on glamour stocks.

While one can never reject the "metaphysical" version of the risk story, in which securities that earn higher returns must by definition be fundamentally riskier, the weight of evidence suggests a more straightforward model. In this model, out of favor (or value) stocks are underpriced relative to their risk and return characteristics, and investing in them indeed earns abnormal returns.

This conclusion raises the obvious question: how can the 7-8% per year in extra returns on value stocks have persisted for so long? One possible explanation is that investors simply did not know about them. This explanation has some plausibility in that quantitative portfolio selection and evaluation are relatively recent activities. Most investors might not have been able, until recently, to perform the analysis done in this paper. Of course, advocacy of value strategies is

decades old, going back at least to Graham and Dodd. But such advocacy is usually not accompanied by detailed statistical work, and hence might not be entirely persuasive, especially since many other strategies are advocated as well. Still, the ignorance story is not completely convincing given the general popularity of value investing.

Another possible explanation is that we have engaged in data snooping, and have just identified an ex post pattern in the data. Several of our results and other pieces of evidence are inconsistent with this hypothesis. First, we have shown that the theoretically motivated value strategies work better than ad hoc value strategies. There is no reason for this to be true if we just found an ex post pattern. Second, we presented evidence indicating that investors in glamour stocks overestimate future growth rates relative to those of value stocks. There is no reason why this prediction would be true if we just found an ex post pattern. Third, and most important, the contrarian model has been tested, and confirmed, using data from other countries, such as Japan (Chan, Hamao, and Lakonishok, 1991). The same coincidence is less likely to materialize in multiple countries.

We conjecture that the results in this paper can best be explained by the preference of both individual and institutional investors for glamour strategies and by their avoidance of value strategies. Below we suggest some reasons for this preference, which might potentially explain the observed returns anomaly.

Individual investors might focus on glamour strategies for a variety of reasons. First, they may make judgment errors and extrapolate past growth rates of glamour stocks, such as WAL-MART or Home Depot, even when such growth rates are highly unlikely to persist in the future. Putting excessive weight on recent past history, as opposed to a rational prior, is a common judgment error in psychological experiments, and not just in the stock market. Alternatively, individuals might just equate well-run firms with good investments regardless of price. After all, how can you lose money on Microsoft or Walmart? Indeed, brokers always recommend "good" companies, with "steady" earnings and dividend growth.

Presumably, the institutional investors should be somewhat more free from judgment biases and excitement about "good companies" than individuals, and so should flock to value strategies. But for several reasons, institutional investors might themselves prefer glamour stocks even if they were less afflicted by extrapolation biases than individuals, which is far from certain. The

reason is the agency context of institutional money management (see Lakonishok, Shleifer, and Vishny, 1992). For example, institutions might prefer glamour stocks because they appear to be "prudent" investments, and hence are easy to justify to sponsors, who erroneously equate good companies with good investments. Glamour stocks have done well in the past, and are unlikely to become financially distressed in the near future, as opposed to value stocks, which have previously done poorly and are more likely to run into financial problems. Many institutions actually screen out stocks of financially distressed firms, many of which are value stocks, from the universe of stocks they pick. Indeed, sponsors (because they themselves extrapolate) might consider glamour stocks to be safer than value stocks, even though, as we have seen, a portfolio of value stocks is actually less risky. The strategy of investing in glamour stocks, while appearing "prudent," is not prudent at all in that it earns a lower expected return and is not fundamentally less risky. Nonetheless, the agency problems between money managers and their sponsors would cause money managers to tilt towards "glamour" stocks (Lakonishok et al, 1992).

Another important factor is that most investors have shorter time horizons than are required for value strategies to consistently pay off. Many individuals look for stocks that will earn them high abnormal returns within a few months, rather than 4 percent per year over the next five years. Institutional money managers often have even shorter time horizons. They often cannot afford to underperform the index or their peers for any non-trivial period of time, for if they do, their sponsors will withdraw the funds. A value strategy that takes 3 to 5 years to pay off but may underperform the market in the meantime (have a large tracking error) might simply be too risky for money managers from the viewpoint of career concerns. If a money manager fears getting fired before a value strategy pays off, he will avoid using such a strategy. When both individuals and institutional money managers prefer glamour and avoid value strategies, value stocks will be cheap and earn a higher average return.

Are the anomalous excess returns on value stocks likely to persist? It is possible that over time more investors will become convinced of the value of being a contrarian with a long horizon and the returns to our strategies will fall. Perhaps the recent move into disciplined quantitative investment strategies, evaluated based only on performance and not on individual stock picks, will increase the demand for value stocks and reduce the agency problems that result in picking glamour stocks. Finally, the rapidly growing mutual funds are likely to be important investors

pursuing value strategies, since they face less pressure to pick glamour stocks for clients than are many investment advisors of pension funds. All of these factors might reduce the future returns to value strategies as such strategies become less contrarian.

Perhaps the most interesting implication of the conjecture that many of the glamour stock investors are money managers is that this may explain their inferior performance. In an earlier paper, we have focused on the striking underperformance of pension fund money managers relative to the market index (Lakonishok, Shleifer, and Vishny, 1992). The large difference in returns on glamour and value can at least in principle explain how money managers can underperform the market by over 100 basis points per year before accounting for management fees. By looking at the actual portfolios of institutional money managers, one can find out whether they are overinvested in glamour stocks and underinvested in value stocks. We plan to do that in a follow-up paper.

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TABLE 1: Decile Returns and Characteristics Based on Book-to-Market

At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

	Glamour									Value
	1	2	3	4	5	6	7	8	9	10
AB1	-.022	-.019	-.002	-.013	-.007	.011	.008	.022	.031	.023
AB2	-.047	-.027	.003	.004	.011	.013	.020	.014	.030	.036
AB3	-.036	-.021	-.004	.009	.005	.009	.022	.036	.026	.031
AB4	-.055	-.017	-.016	.004	.016	.012	.027	.034	.045	.044
AB5	-.056	-.017	.003	.013	.008	.013	.046	.031	.032	.042
AAB	-.043	-.020	-.003	.004	.006	.012	.024	.028	.033	.035
CAB5	-.199	-.098	-.016	.018	.032	.057	.128	.146	.175	.188
C5	.560	.802	.973	1.045	1.082	1.152	1.320	1.375	1.449	1.462

B. CHARACTERISTICS OF DECILES

	1	2	3	4	5	6	7	8	9	10
BM	.225	.414	.556	.685	.810	.936	1.082	1.270	1.548	1.988
Size	663.3	563.6	508.8	447.6	430.3	394.4	386.5	304.3	209.2	120.0
EP	.029	.059	.071	.079	.084	.089	.092	.083	.066	.004
CP	.059	.100	.124	.145	.158	.173	.186	.186	.187	.172
SP	.993	1.462	1.881	2.198	2.517	2.880	3.192	3.904	4.789	4.906
OP	.116	.173	.212	.250	.274	.300	.322	.335	.347	.342
DP	.012	.017	.022	.027	.032	.036	.038	.037	.033	.032
GE	.309	.218	.185	.154	.126	.099	.083	.061	-.004	-.274
GC	.234	.186	.159	.134	.108	.092	.079	.064	.035	-.035
GS	.091	.114	.098	.092	.076	.070	.066	.057	.046	.030
GO	.203	.178	.148	.126	.101	.088	.079	.068	.050	.028

TABLE 2: Portfolio Returns and Characteristics Based on Cash-Flow-to-Price

At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

	Glamour									Value
	1	2	3	4	5	6	7	8	9	10
AB1	-.049	-.012	-.002	.000	.010	.009	.014	.032	.035	.035
AB2	-.061	-.030	-.015	.013	.013	.027	.031	.032	.028	.037
AB3	-.050	-.024	-.007	.012	.008	.029	.025	.033	.024	.032
AB4	-.042	-.038	-.007	.001	.009	.014	.026	.032	.056	.051
AB5	-.040	-.023	.000	.002	.022	.015	.028	.041	.045	.037
AAB	-.049	-.025	-.006	.005	.013	.019	.025	.034	.037	.039
CAB5	-.220	-.120	-.031	.027	.065	.097	.130	.181	.201	.209
C5	.543	.779	.969	1.074	1.158	1.206	1.283	1.406	1.476	1.494

B. CHARACTERISTICS OF DECILES

	1	2	3	4	5	6	7	8	9	10
BM	.526	.563	.680	.765	.851	.945	1.013	1.128	1.265	1.502
Size	438.2	463.3	428.6	421.4	394.3	393.0	399.9	439.9	407.5	263.3
EP	.010	.047	.062	.078	.089	.097	.106	.117	.127	.131
CP	.044	.081	.106	.128	.149	.171	.196	.226	.268	.345
SP	1.371	1.479	1.908	2.256	2.543	2.866	3.211	3.715	4.410	6.317
OP	.091	.141	.184	.219	.255	.287	.326	.373	.441	.575
DP	.012	.018	.021	.026	.030	.034	.036	.038	.039	.034
GE	.172	.177	.160	.134	.123	.107	.106	.100	.095	.051
GC	.113	.150	.139	.120	.113	.096	.097	.090	.089	.082
GS	.046	.081	.084	.085	.083	.073	.073	.071	.069	.060
GO	.108	.142	.132	.121	.110	.093	.094	.087	.087	.086

TABLE 3: Decile Returns and Characteristics Based on Earning-to-Price

At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous year earnings to end-of-April-market-value-of-equity. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

	Glamour									Value
	1	2	3	4	5	6	7	8	9	10
AB1	-.019	-.012	-.001	-.007	-.006	.012	.024	.030	.042	.012
AB2	-.040	-.025	-.016	.001	.024	.018	.030	.029	.026	.012
AB3	-.037	-.023	-.003	.006	.007	.028	.027	.015	.011	.013
AB4	-.039	-.028	-.011	-.006	-.001	.000	.028	.028	.035	.036
AB5	-.040	-.030	-.011	.004	.002	.009	.023	.028	.033	.024
AAB	-.035	-.024	-.009	-.001	.005	.013	.026	.026	.029	.019
CAB5	-.163	-.113	-.042	-.003	.027	.069	.138	.138	.155	.100
C5	.717	.808	.953	1.031	1.102	1.168	1.370	1.393	1.446	1.388

B. CHARACTERISTICS OF DECILES

	1	2	3	4	5	6	7	8	9	10
BM	.716	.642	.694	.744	.821	.896	.982	1.072	1.184	1.401
Size	387.3	483.9	509.4	499.7	498.7	437.1	445.7	410.5	391.4	275.3
EP	.024	.049	.065	.079	.091	.102	.115	.130	.149	.181
CP	.092	.106	.122	.140	.158	.176	.192	.218	.245	.307
SP	2.165	7.895	2.052	2.152	2.376	2.664	2.947	3.339	3.816	5.336
OP	.156	.172	.201	.231	.260	.293	.321	.366	.414	.522
DP	.013	.017	.022	.028	.032	.035	.037	.040	.040	.038
GE	.088	.138	.144	.128	.120	.117	.116	.119	.123	.139
GC	.078	.122	.124	.116	.111	.106	.107	.106	.110	.120
GS	.040	.073	.083	.083	.087	.081	.079	.080	.080	.977
GO	.077	.115	.117	.111	.107	.100	.101	.104	.103	.115

TABLE 4: Portfolio Returns and Characteristics Based on Growth-in-Sales

At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation 5 year weighted average rank of sales growth. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

	Value									Glamour
	1	2	3	4	5	6	7	8	9	10
AB1	.021	.025	.011	.019	.013	.007	.010	.019	-.002	-.028
AB2	.016	.017	.032	.018	.019	.013	.005	.007	.000	-.015
AB3	.020	.030	.022	.021	.018	.015	.003	.015	-.006	-.022
AB4	.032	.026	.031	.026	.019	.017	.003	-.002	.007	-.025
AB5	.020	.038	.028	.034	.006	.020	.017	.003	.003	-.028
AAB	.022	.027	.025	.024	.015	.015	.008	.008	.000	-.024
CAB5	.114	.144	.131	.123	.078	.075	.040	.042	.002	-.113
C5	1.434	1.435	1.364	1.314	1.205	1.206	1.144	1.136	1.057	.818

B. CHARACTERISTICS OF DECILES

	1	2	3	4	5	6	7	8	9	10
BM	1.184	1.194	1.114	1.054	.990	.945	.900	.842	.760	.638
Size	198.3	332.3	388.4	413.2	461.4	499.2	508.8	536.5	567.2	545.1
EP	-.029	.036	.055	.072	.079	.087	.087	.090	.092	.086
CP	.078	.143	.153	.165	.169	.172	.167	.167	.160	.147
SP	4.280	4.100	3.699	3.448	3.159	3.031	2.928	2.858	2.616	2.227
OP	.203	.275	.285	.292	.295	.299	.292	.293	.281	.259
DP	.023	.032	.033	.035	.035	.034	.033	.030	.026	.019
GE	-.187	-.019	.008	.043	.053	.075	.079	.099	.116	.141
GC	-.022	.032	.047	.071	.087	.097	.109	.127	.152	.198
GS	-.035	.001	.015	.026	.040	.050	.061	.074	.092	.125
GO	-.028	.007	.023	.032	.049	.062	.070	.089	.105	.138

TABLE 5: Portfolio Returns and Characteristics Based on Cash-Flow-to-Price and Growth-in-Sales

At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity and by the pre-formation-5-year-weighted-average-rank-of-sales-growth. The 9 portfolios are intersections resulting from these 2 independent classifications. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

			Glamour				Value		
CP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
AB1	-.005	-.015	-.027	.028	.008	-.005	.054	.050	-.007
AB2	-.015	-.022	-.040	.031	.020	.017	.054	.026	.011
AB3	-.011	-.016	-.036	.031	.023	.000	.048	.026	.003
AB4	-.006	-.024	-.036	.030	.008	.011	.061	.041	.011
AB5	.005	-.021	-.029	.030	.013	-.010	.056	.038	.023
AAB	-.006	-.020	-.033	.030	.014	.003	.054	.036	.008
CAB5	-.032	-.094	-.156	.160	.074	.013	.304	.193	.041
C5	1.122	.843	.712	1.419	1.200	1.076	1.711	1.497	1.163

B. CHARACTERISTICS OF DECILES

CP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
BM	.898	.566	.385	1.074	.863	.710	1.414	1.269	1.148
Size	273.0	589.4	681.0	380.2	488.0	495.1	389.9	444.3	360.9
EP	.020	.048	.054	.085	.097	.100	.114	.134	.142
CP	.077	.084	.080	.166	.163	.159	.279	.278	.285
SP	2.450	1.539	1.115	3.200	2.571	2.446	5.279	4.604	4.470
OP	.144	.148	.139	.270	.275	.274	.449	.463	.487
DP	.022	.020	.014	.036	.035	.024	.039	.042	.031
GE	-.063	.069	.142	.050	.086	.142	.082	.108	.143
GC	.018	.121	.205	.051	.097	.205	.047	.087	.140
GS	-.018	.053	.112	.007	.057	.105	.013	.056	.106
GO	-.028	.059	.131	.019	.068	.131	.035	.075	.118

TABLE 6: Portfolio Returns and Characteristics Based on Earning-to-Price and Growth-in-Sales

At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous year's earnings to end-of-April-market-value-of-equity and by the pre-formation-5-year-weighted-average-rank-of-sales-growth. The 9 portfolios are intersections resulting from these 2 independent classifications. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

			Glamour				Value		
EP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
AB1	.020	-.001	-.024	.028	.005	-.002	.051	.043	.020
AB2	-.004	-.016	-.035	.038	.022	.011	.041	.026	.015
AB3	-.002	-.012	-.034	.043	.018	.008	.026	.021	.010
AB4	.003	-.013	-.045	.027	.009	.002	.051	.041	.019
AB5	.007	-.012	-.045	.028	.012	-.008	.029	.039	.019
AAB	.005	-.011	-.037	.033	.013	.002	.040	.034	.017
CAB5	.024	-.053	-.170	.174	.067	.009	.216	.182	.087
C5	1.315	.986	.674	1.533	1.230	1.063	1.716	1.523	1.365

B. CHARACTERISTICS OF DECILES

EP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
BM	1.077	.756	.454	1.127	.889	.692	1.409	1.252	1.129
Size	284.0	502.6	702.0	424.8	543.0	568.4	354.9	431.8	400.5
EP	.044	.049	.051	.101	.099	.095	.154	.152	.158
CP	.133	.118	.093	.186	.173	.155	.268	.257	.260
SP	3.236	2.280	1.365	3.267	2.518	2.239	4.807	4.169	4.040
OP	.213	.195	.157	.299	.284	.262	.432	.429	.450
DP	.022	.021	.014	.040	.038	.027	.042	.045	.035
GE	.028	.105	.187	.070	.105	.161	.097	.120	.169
GC	.025	.094	.181	.061	.096	.153	.074	.103	.163
GS	.000	.070	.152	.024	.077	.140	.025	.071	.139
GO	.020	.090	.182	.047	.092	.155	.059	.097	.160

TABLE 7: Portfolio Returns and Characteristics Based on Book-to-Market and Growth-in-Sales

At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity and by the pre-formation-5-year-weighted-average-rank-of-sales-growth. The 9 portfolios are intersections resulting from these 2 independent classifications. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. ABi is the size-adjusted return in year i after formation, i = 1, . . ., 5. AAB is the average over 5-post-formation-years'-size-adjusted-return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted-return. C5 is the cumulative over 5-post-formation-years'-raw-return. BM, Size, EP, CP, SP, OP, and DP, defined below, use end-of-April-market-value-of-equity and pre-formation-year-accounting. BM is the ratio of book-value-of-equity-to-market-value-of-equity. Size is the total-dollar value of equity (in millions). EP is the ratio of earnings-to-market-value-of-equity. CP is the ratio of cash-flow-to-market-value-of-equity. SP is the ratio of sales-to-market-value-of-equity. OP is the ratio of operating-income-to-market-value-of-equity. DP is the ratio of dividends-to-market-value-of-equity. GE, GC, GS, and GO refer to pre-formation-5-year-average-growth rates of earnings, cash flow, sales, and operating income, respectively.

A. RETURNS

			Glamour				Value		
BM	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
AB1	-.003	-.005	-.013	.010	.009	-.026	.038	.038	.003
AB2	-.017	-.007	-.019	.016	.019	.000	.038	.016	.021
AB3	-.017	-.008	-.021	.024	.017	-.016	.037	.028	.017
AB4	-.007	-.020	-.023	.028	.014	-.005	.044	.033	.034
AB5	-.001	-.019	-.029	.034	.018	.003	.041	.037	.009
AAB	-.009	-.012	-.021	.022	.015	-.009	.039	.030	.017
CAB5	-.044	-.058	-.100	.116	.079	-.043	.213	.160	.087
C5	.974	.925	.842	1.325	1.224	.990	1.018	1.387	1.171
R36	.719	.966	1.387	.378	.500	.618	.048	.131	.129

B. CHARACTERISTICS OF DECILES

BM	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
BM	.425	.440	.392	.912	.884	.849	1.66	1.55	1.50
Size	514.7	749.8	704.2	432.7	477.1	449.0	199.0	284.3	274.9
EP	.018	.064	.068	.065	.099	.111	.026	.092	.115
CP	.074	.106	.105	.145	.180	.194	.160	.226	.248
SP	1.968	1.490	1.360	2.738	2.650	2.861	5.400	5.237	5.287
OP	.160	.179	.176	.253	.303	.337	.312	.414	.477
DP	.019	.022	.016	.035	.037	.029	.033	.038	.033
GE	.083	.122	.159	.040	.081	.118	-.067	.039	.068
GC	.177	.177	.180	.099	.103	.098	.013	.026	.040
GS	-.020	.060	-.020	.101	.056	.003	.107	.053	.003
GO	.034	.095	.143	.023	.066	.111	-.002	.026	.040

TABLE 8: Summary of Decile Returns for the Largest 50% of Stocks

At the end of each April between 1968 and 1989, the largest 50 percent of stocks by market capitalization at that time are sorted into 9 or 10 groups. In panel 1, stocks are sorted into deciles by the pre-formation-5-year-weighted-average-rank-of-sales growth. In panel 2, stocks are sorted into deciles by the ratio of last-year's-cash-flow-to-end-of-April-market-value-of-equity. The 9 portfolios are intersections resulting from these 2 independent classifications. In panel 3, all stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity and by the pre-formation-5-year-weighted-average-rank-of-sales growth. The 9 portfolios are intersections resulting from these 2 independent classifications. In panel 4, stocks are sorted into deciles by the ratio of last-year's-book-value-of-equity-to-end-of-April-market-value-of-equity. In panel 5, stocks are sorted into deciles by the ratio of last-year's-earnings-to-end-of-April-market-value-of-equity. In panel 6, all stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-earnings-to-end-of-April-market-value-of-equity and by the pre-formation-5-year-weighted-average-rank-of-sales growth. The 9 portfolios are intersections resulting from these 2 independent classifications. All numbers presented in the table are averages over the 22 formation periods computed for corresponding portfolios. AAB is the average over 5-post-formation-years-size-adjusted return. CAB5 is the cumulative over 5-post-formation-years'-size-adjusted. C5 is the cumulative over 5-post-formation-years'-raw return.

GS	1	2	3	4	5	6	7	8	9	10
AAB	.031	.036	.021	.023	.012	.009	-.003	.000	-.006	-.036
CAB5	.166	.194	.111	.123	.060	.043	-.016	.000	-.027	-.169
C5	1.247	1.321	1.188	1.199	1.118	1.073	1.010	.999	.968	.705

CP	1	2	3	4	5	6	7	8	9	10
AAB	-.052	-.030	-.007	.003	.015	.016	.017	.022	.030	.029
CAB5	-.235	-.142	-.034	.014	.078	.080	.087	.116	.158	.156
C5	.504	.723	.935	1.019	1.138	1.136	1.143	1.163	1.223	1.243

CP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
AAB	.001	-.020	-.039	.030	.010	.001	.048	.021	-.010
CAB5	.007	-.097	-.181	.160	.052	.002	.263	.110	-.049
C5	1.094	.799	.654	1.270	1.106	1.040	1.328	1.226	.934

BM	1	2	3	4	5	6	7	8	9	10
AAB	-.043	-.016	.001	.002	.007	.007	.017	.028	.036	.022
CAB5	-.198	-.077	.007	.012	.036	.036	.088	.146	.193	.113
C5	.566	.865	1.020	1.018	1.051	1.075	1.149	1.229	1.303	1.121

EP	1	2	3	4	5	6	7	8	9	10
AAB	-.042	-.028	-.011	.003	.005	.011	.020	.027	.029	.015
CAB5	-.194	-.131	-.052	.015	.026	.053	.106	.145	.153	.075
C5	.564	.704	.887	1.018	1.028	1.085	1.203	1.249	1.251	1.127

EP	1	1	1	2	2	2	3	3	3
GS	1	2	3	1	2	3	1	2	3
AAB	.012	-.011	-.037	.034	.012	-.002	.046	.031	.007
CAB5	.059	-.052	-.174	.184	.061	-.012	.252	.162	.036
C5	1.176	.894	.631	1.307	1.126	.997	1.344	1.301	1.124

TABLE 9: Regression of Returns on Characteristics for All Firms

At the end of each April between 1968 and 1989, we compute for every firm in the sample the 1-year-holding-period return starting at the end of April. We then run 22 cross-sectional regressions with these returns for each formation period as dependent variables. The independent variables are 1) GS, the pre-formation-5-year-weighted-average-rank-of-sales growth; 2) BM, the ratio of end-of-previous-year's-book-value-of-equity-to-market-value-of-equity; 3) Size, the end-of-April-natural-logarithm-of-market-value-of-equity (in millions); 4) EP+, equal to EP--the ratio of previous-year's-earnings-to-end-of-April-market-value-of-equity--if EP is positive--and to zero if EP is negative; 5) DEP equal to 1 if EP is negative, and to zero if EP is positive; 6) CP+, equal to CP--the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity--if CP is postive--and to zero if CP is negative; 7) DCP, equal to 1 if CP is negative, and to zero if CP is positive. The reported coefficients are averages over the 22 formation periods. The reported t-statistics are based on the cross-sectional variance of the 22 coefficients.

	INT	GS	BM	SIZE	EP+	DEP	CP+	DCP
Mean	.180	-.061						
T. ST.	3.251	-2.200						
Mean	.108		.039					
T. ST.	2.167		2.132					
Mean	.185			-.009				
T. ST.	2.140			-1.095				
Mean	.110				.526			
T. ST.	2.029				2.541			
Mean	.099						.356	
T. ST.	1.873						4.240	
Mean	.129	-.058	.006				.301	-.029
T. ST.	2.584	-2.832	.330				3.697	-1.222
Mean	.143		.009	-.009			.280	-.032
T. ST.	1.562		.565	-1.148			4.223	-1.625
Mean	.169	-.044	.000	-.009			.296	-.036
T. ST.	1.947	-2.125	.005	-1.062			4.553	-1.625
Mean	.172	-.051	.016	-.009	.394	-.032		
T. ST.	1.961	-2.527	1.036	-1.065	2.008	-1.940		

TABLE 10: Past, Expected, and Future Growth: Glamour - Value

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each decile portfolio, we compute 1) the average past 5-year-growth rate of sales, earnings, operating income, and cash flow of the portfolio; 2) the future growth rate in years +1, . . ., +5 of sales, earnings, operating income, and cash flow of the portfolio; and 3) the ratio of last year's earnings, operating income and cash flow to end-of-April-market-value-equity-of-the-portfolio. The table presents the average over 22 formation periods difference in all these variables between the lowest BM (glamour) and highest BM (value) decile portfolios.

Panel 2: At the end of each April between 1968 and 1989, 9 portfolios of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each portfolio, we compute 1) the average past 5-year-growth rate of sales, earnings, operating income, and cash flow of the portfolio; 2) the future growth rate in years +1, . . ., +5 of sales, earnings, operating income, and cash flow of the portfolio; and 3) the ratio of last year's earnings, operating income, and cash flow to end-of-April-market-value-equity-of-the-portfolio. The table presents the average over 22 formation periods difference in all these variables between the lowest CP, highest GS (glamour) and highest CP, lowest GS (value) portfolios.

	Δ Past Growth	Δ Expected Growth	Δ 1-Year Growth	Δ 2-Year Growth	Δ 3-Year Growth	Δ 4-Year Growth	Δ 5-Year Growth	Δ Average Growth
Panel 1:								
BM								
Sales	.061	X	.064	.042	.031	.039	.037	.042
Earnings	.583	-.025	-1.149	-.553	-.203	-.124	-.108	-.386
Operating Income	.231	.226	-.024	-.018	-.004	.012	.015	-.004
Cash Flow	.269	.113	-.074	-.084	.004	.005	-.005	-.030
Panel 2:								
CP								
GS								
Sales	.089	X	.116	.066	.056	.039	.036	.063
Earnings	.060	.060	.276	-.093	-.127	-.028	-.022	.003
Operating Income	.096	.310	.156	.023	.015	.011	.027	.046
Cash Flow	.158	.199	.024	-.015	.020	.017	.002	.027

TABLE 11: Raw Returns Consistency: Value - Glamour

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). For each portfolio, 1-, 3-, and 5-year-holding-period returns are computed. For each formation period, panel 1 reports the difference in the 1-, 3-, and 5-year return between the 2 lowest GS (value) and 2 highest GS (glamour) portfolios.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each portfolio, 1-, 3-, and 5-year-holding-period returns are computed. For each formation period, panel 2 reports the difference in the 1-, 3-, and 5-year return between the 2 highest CP (value) and 2 lowest CP (glamour) portfolios.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each portfolio, 1-, 3-, and 5-year-holding-period returns are computed. For each formation period, panel 3 reports the difference in the 1-, 3-, and 5-year return between the lowest GS, highest CP (value) and the highest GS, lowest CP (glamour) portfolios.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each portfolio, 1-, 3-, and 5-year-holding-period returns are computed. For each formation period, panel 4 reports the difference in the 1-, 3-, and 5-year return between the highest BM (value) and lowest BM (glamour) decile portfolios.

	PANEL 1			PANEL 2			PANEL 3			PANEL 4		
	GS: 1, 2 - 9, 10			CP: 9, 10 - 1, 2			GS-CP: 3, 1 - 1, 3			BM: 9, 10 - 1, 2		
	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year
1968	.130	.041	-.018	.022	.287	.474	.144	.153	.267	.098	.201	.344
1969	.070	-.097	.126	.123	.195	.410	.065	-.143	.283	.074	.070	.303
1970	-.108	.037	.193	.135	.246	.428	.002	.160	.356	.023	.032	.279
1971	-.059	.081	.231	-.078	.231	.478	-.144	.196	.531	-.108	.156	.463
1972	.074	.249	.544	.155	.319	.693	.134	.362	.932	.098	.328	.784
1973	.156	.424	.765	.021	.382	.846	.152	.702	1.416	.042	.450	.925
1974	.122	.488	.944	-.007	.496	1.343	.069	.650	1.597	.050	.642	1.726
1975	.261	.564	.311	.262	.816	1.310	.379	1.115	1.229	.418	1.034	1.182
1976	.030	.109	-.035	.174	.673	1.468	.217	.715	1.235	.132	.727	.993
1977	.146	.020	.308	.193	.247	.764	.219	.149	.844	.195	.181	.614
1978	-.002	-.029	.498	.048	-.106	.272	.039	-.072	.581	.037	-.264	.286
1979	-.062	.013	.332	-.168	-.102	.274	-.176	.098	.757	-.207	-.123	.569
1980	-.012	.650	.929	.039	.745	1.225	.110	1.246	2.000	-.034	1.066	1.676
1981	.154	.512	1.165	.203	.650	1.584	.236	.940	2.134	.185	.810	1.955
1982	.247	.394	1.304	-.032	.338	1.253	.118	.539	1.866	.240	.589	1.477
1983	.050	.167	.359	.204	.332	.851	.252	.578	1.470	.221	.256	.648
1984	-.126	-.090	.109	.192	.552	.888	.052	.641	1.092	.043	.324	.640
1985	-.081	.190	.301	.014	.322	.576	-.032	.531	.708	-.007	.237	.299
1986	.149	.288		.108	.339		.196	.427		.051	.149	
1987	.075	.175		.093	.170		.111	.290		.078	.015	
1988	-.009			.092			.089			-.037		
1989	-.010			-.063			.010			-.207		

TABLE 12: Size-Adjusted Returns Consistency: Value - Glamour

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). For each portfolio, 1-, 3-, and 5-year holding-period-size-adjusted returns are computed. For each formation period, panel 1 reports the difference in the 1-, 3-, and 5-year size-adjusted return between the 2 lowest GS (value) and 2 highest GS (glamour) portfolios.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each portfolio, 1-, 3-, and 5-year-holding-period-size-adjusted returns are computed. For each formation period, panel 2 reports the difference in the 1-, 3-, and 5-year-size-adjusted return between the 2 highest CP (value) and 2 lowest CP (glamour) portfolios.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each portfolio, 1-, 3-, and 5-year-holding-period-size-adjusted returns are computed. For each formation period, panel 3 reports the difference in the 1-, 3-, and 5-year-size-adjusted return between the lowest GS, highest CP (value) and the highest GS, lowest CP (glamour) portfolios.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each portfolio, 1-, 3-, and 5-year-holding-period-size-adjusted returns are computed. For each formation period, panel 4 reports the difference in the 1-, 3-, and 5-year-size-adjusted return between the highest BM (value) and lowest BM (glamour) decile portfolios.

	PANEL 1			PANEL 2			PANEL 3			PANEL 4		
	GS: 1, 2 - 9, 10			CP: 9, 10 - 1, 2			GS-CP: 3, 1 - 1, 3			BM: 9, 10 - 1, 2		
	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year
1968	.061	.037	.046	.014	.271	.455	.105	.129	.297	.049	.189	.356
1969	.101	-.055	.200	.104	.162	.353	.085	-.129	.332	.095	.092	.336
1970	-.117	.083	.255	.124	.291	.463	-.017	.243	.451	.002	.119	.387
1971	-.060	.148	.281	-.078	.250	.509	-.145	.266	.587	-.110	.240	.529
1972	.127	.306	.590	.175	.337	.721	.214	.453	1.003	.171	.420	.855
1973	.176	.404	.658	.043	.331	.593	.180	.644	1.165	.082	.387	.587
1974	.128	.369	.508	-.001	.299	.648	.078	.405	.743	.062	.406	.845
1975	.130	.161	-.307	.134	.365	.640	.191	.469	.238	.213	.388	.237
1976	.019	-.184	-.709	.148	.468	1.012	.183	.324	.381	.110	.356	.168
1977	.014	-.203	-.182	.079	.064	.382	.037	-.152	.230	.020	-.108	-.012
1978	-.049	-.225	-.216	.036	-.147	.083	-.001	-.235	.002	-.003	-.414	-.341
1979	-.051	-.048	-.081	-.163	-.135	.122	-.163	.056	.446	-.193	-.201	.111
1980	-.077	.291	.618	-.001	.550	1.029	.038	.874	1.653	-.113	.638	1.288
1981	.140	.305	1.034	.198	.623	1.536	.222	.776	2.000	.170	.621	1.808
1982	.082	.248	1.239	-.058	.308	1.212	-.008	.417	1.823	.078	.449	1.399
1983	.032	.249	.550	.207	.300	.757	.235	.619	1.574	.207	.311	.763
1984	-.076	.082	.431	.182	.475	.762	.084	.756	1.279	.078	.410	.795
1985	-.055	.285	.498	.014	.328	.566	-.016	.604	.815	.026	.357	.544
1986	.167	.392		.101	.322		.209	.496		.077	.291	
1987	.104	.268		.102	.192		.132	.361		.118	.149	
1988	.029			.105			.119			.020		
1989	.031			-.045			.045			-.130		

TABLE 13: Performance of Portfolios in Best- and Worst-Stock-Market Months

All months in the sample are divided into 25-worst-stock-return months based on the equally-weighted index (W25), the remaining 88-negative months other than the 25-worst (N88), the 122-positive months other than the 25-best (P122), and the 25-best months (B25) in the sample.

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). For each decile portfolio (changing every April), panel 1 presents its average return over the W25, N88, P122, and B25 months.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each decile portfolio (changing every April), panel 2 presents its average return over the W25, N88, P122, and B25 months.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each portfolio (changing every April), panel 3 presents its average return over the W25, N88, P122, and B25 months.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each portfolio (changing every April), panel 4 presents its average return over the W25, N88, P122, and B25 months.

Panel 1:

GS	1	2	3	4	5	6	7	8	9	10	Index
W25	-.104	-.092	-.094	-.091	-.088	-.094	-.093	-.093	-.101	-.110	-.102
N88	-.020	-.017	-.018	-.019	-.020	-.019	-.021	-.023	-.026	-.031	-.023
P122	.042	.039	.039	.038	.036	.037	.037	.039	.038	.038	.037
B25	.134	.118	.115	.110	.106	.110	.114	.113	.114	.124	.121

Panel 2:

CP	1	2	3	4	5	6	7	8	9	10	Index
W25	-.118	-.111	-.106	-.103	-.097	-.095	-.090	-.087	-.088	-.098	-.102
N88	-.030	-.028	-.027	-.024	-.023	-.021	-.020	-.019	-.016	-.020	-.023
P122	.037	.039	.040	.038	.039	.038	.038	.038	.037	.038	.037
B25	.121	.125	.122	.119	.116	.109	.112	.115	.119	.136	.121

	Glamour							Value			
Panel 3:											
CP	1	2	3	1	2	3	1	2	3		Index
GS	3	3	3	2	2	2	1	1	1		
W25	-.103	-.100	-.105	-.103	-.091	-.080	-.114	-.090	-.086		-.102
N88	-.029	-.025	-.022	-.025	-.020	-.016	-.023	-.016	-.015		-.023
P122	.038	.039	.038	.039	.038	.038	.039	.040	.040		.037
B25	.110	.115	.124	.111	.104	.113	.131	.110	.124		.121

Panel 4:

BM	1	2	3	4	5	6	7	8	9	10	Index
W25	-.112	-.110	-.104	-.100	-.097	-.091	-.093	-.092	-.098	-.102	-.102
N88	-.029	-.028	-.026	-.025	-.023	-.020	-.021	-.020	-.018	-.022	-.023
P122	.038	.040	.039	.037	.036	.037	.038	.037	.038	.039	.037
B25	.114	.114	.119	.113	.112	.113	.118	.126	.133	.148	.121

TABLE 14: Performance of Portfolios in Best and Worst Quarters Based on Real-GNP Growth One Quarter Ahead

All quarters in the sample are divided into 4 sets: 10 quarters of the lowest-real-GNP growth during the sample period, 34-next-lowest-real-GNP-growth quarters, 34-next-worst-growth quarters, and 10-highest-real-GNP-growth quarters.

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). For each decile portfolio (changing every April), panel 1 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by real-GNP growth.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each decile portfolio (changing every April), panel 2 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by real-GNP growth.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each (changing every April) portfolio, panel 3 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by real-GNP growth.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each portfolio (changing every April), panel 4 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by real-GNP growth.

Panel 1:

GS	1	2	3	4	5	6	7	8	9	10	ΔGNP
Worst 10	.040	.038	.022	.022	.020	.007	.017	.012	-.001	-.005	-.017
Next Worst 34	.022	.017	.015	.017	.009	.016	.017	.019	.010	.003	.000
Next Best 34	.033	.036	.035	.037	.036	.033	.033	.033	.031	.023	.012
Best 10	.140	.133	.120	.121	.125	.123	.123	.124	.127	.109	.031

Panel 2:

CP	1	2	3	4	5	6	7	8	9	10	ΔGNP
Worst 10	.003	.007	.004	.017	.018	.016	.020	.025	.019	.015	-.017
Next Worst 34	.001	.007	.013	.009	.013	.014	.009	.016	.020	.018	.000
Next Best 34	.017	.025	.031	.030	.034	.031	.036	.041	.041	.042	.012
Best 10	.101	.118	.117	.124	.128	.132	.136	.134	.135	.132	.031

	Glamour						Value			
Panel 3:										
CP	1	2	3	1	2	3	1	2	3	ΔGNP
GS	3	3	3	2	2	2	1	1	1	
Worst 10	-.009	.013	.008	.014	.016	.020	.032	.037	.041	-.017
Next Worst 34	.011	.011	.012	.010	.014	.023	.021	.018	.027	.000
Next Best 34	.026	.029	.034	.029	.033	.046	.026	.040	.046	.012
Best 10	.103	.123	.136	.107	.123	.133	.122	.140	.139	.031

Panel 4:

BM	1	2	3	4	5	6	7	8	9	10	ΔGNP
Worst 10	-.004	.001	.012	.018	.009	.016	.017	.028	.021	.015	-.017
Next Worst 34	.011	.008	.011	.009	.008	.010	.010	.016	.017	.012	.000
Next Best 34	.022	.028	.027	.025	.030	.035	.036	.035	.041	.039	.012
Best 10	.092	.102	.118	.117	.117	.135	.132	.141	.145	.151	.031

TABLE 15: Performance of Portfolios in Best and Worst Quarters Based on Change in Unemployment One Quarter Ahead

All quarters in the sample are divided into 4 sets: 10 quarters of the highest growth of unemployment during the sample period, 34-next-highest-unemployment-growth quarters, 34-next-highest-unemployment-growth quarters, and 10-lowest-unemployment-growth quarters.

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). For each decile portfolio (changing every April), panel 1 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by unemployment growth.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each decile portfolio (changing every April), panel 2 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by unemployment growth.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each portfolio (changing every April), panel 3 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by unemployment growth.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each portfolio (changing every April), panel 4 presents its average return in the quarter prior to the 10-worst, 34-next, 34-next, and 10-best quarters ranked by unemployment growth.

Panel 1:

GS	1	2	3	4	5	6	7	8	9	10	ΔUnemp
Worst 10	.016	.028	.014	.022	.019	.018	.015	.013	.006	.013	.008
Next Worst 34	.023	.027	.026	.028	.024	.023	.028	.029	.024	.015	.001
Next Best 34	.059	.047	.044	.045	.044	.044	.042	.044	.040	.030	-.002
Best 10	.077	.072	.062	.059	.051	.050	.053	.050	.043	.031	-.005

Panel 2:

CP	1	2	3	4	5	6	7	8	9	10	ΔUnemp
Worst 10	-.011	.012	.008	.014	.018	.014	.013	.022	.020	.019	.008
Next Worst 34	.014	.021	.021	.022	.029	.026	.025	.030	.029	.023	.001
Next Best 34	.035	.036	.044	.041	.040	.041	.043	.048	.049	.050	-.002
Best 10	.014	.030	.044	.048	.051	.057	.065	.067	.075	.085	-.005

	Glamour						Value			
Panel 3:										
CP	1	2	3	1	2	3	1	2	3	ΔUnemp
GS	3	3	3	2	2	2	1	1	1	
Worst 10	.008	.016	.002	.004	.015	.032	.007	.021	.027	.008
Next Worst 34	.023	.026	.024	.021	.026	.031	.017	.033	.034	.001
Next Best 34	.036	.036	.043	.044	.041	.052	.047	.050	.059	-.002
Best 10	.012	.045	.073	.030	.053	.072	.056	.069	.087	-.005

Panel 4:

BM	1	2	3	4	5	6	7	8	9	10	ΔUnemp
Worst 10	-.004	.003	.013	.010	.009	.020	.016	.023	.027	.012	.008
Next Worst 34	.023	.020	.022	.023	.021	.023	.023	.030	.021	.018	.001
Next Best 34	.036	.037	.039	.035	.036	.045	.043	.044	.050	.051	-.002
Best 10	.007	.029	.042	.041	.050	.053	.065	.070	.092	.090	-.005

TABLE 16: Risk Characteristics of Portfolios

For each portfolio described below, we compute using 22-year-after-the-formation returns as observations of its beta with respect to the value-weighted index. We also compute using the 22-formation periods the standard deviation of returns and the standard deviation of abnormal returns in the year after formation.

Panel 1: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). For each decile portfolio, panel 1 presents its beta, standard deviation of returns, and standard deviation of abnormal returns defined above.

Panel 2: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP). For each decile portfolio, panel 2 presents its beta, standard deviation of returns, and standard deviation of abnormal returns defined above.

Panel 3: At the end of each April between 1968 and 1989, 9 groups of stocks are formed as follows. All stocks are independently sorted into 3 groups (bottom 30%, middle 40%, and top 30%) by the ratio of previous-year's-cash-flow-to-end-of-April-market-value-of-equity (CP) and by the pre-formation-5-year-weighted-average-rank-of-sales-growth (GS). The 9 portfolios are intersections resulting from these 2 independent classifications. For each group of stocks, panel 3 presents its beta, standard deviation of returns, and standard deviation of abnormal returns defined above.

Panel 4: At the end of each April between 1968 and 1989, 10 decile portfolios are formed based on the ratio of end-of-previous-year's-book-value-of-equity-to-end-of-April-market-value-of-equity (BM). For each decile portfolio, panel 4 presents its beta, standard deviation of returns, and standard deviation of abnormal returns defined above.

Panel 1: GS	1	2	3	4	5	6	7	8	9	10	Equally-Weighted Index
β	1.360	1.261	1.283	1.232	1.218	1.180	1.198	1.264	1.271	1.290	1.304
Standard deviation	.253	.230	.228	.217	.213	.205	.207	.218	.221	.236	.250
Standard deviation of size-adjusted return	.059	.052	.048	.039	.031	.033	.032	.036	.039	.072	--

Panel 2: CP	1	2	3	4	5	6	7	8	9	10	Equally-Weighted Index
β	1.268	1.293	1.321	1.333	1.318	1.237	1.182	1.247	1.224	1.384	1.304
Standard deviation	.224	.227	.239	.237	.232	.221	.212	.223	.224	.252	.250
Standard deviation of size-adjusted return	.037	.044	.049	.036	.033	.034	.042	.036	.048	.058	--

Panel 3: CP	1	2	3	1	2	3	1	2	3	Equally-Weighted Index
GS	3	3	3	2	2	2	1	1	1	
β	1.249	1.296	1.293	1.239	1.184	1.214	1.330	1.258	1.322	1.304
Standard deviation	.216	.232	.241	.215	.207	.213	.242	.224	.241	.250
Standard deviation of size-adjusted return	.061	.040	.066	.049	.033	.047	.066	.047	.065	--

Panel 4: BM	1	2	3	4	5	6	7	8	9	10	Equally-Weighted Index
β	1.248	1.268	1.337	1.268	1.252	1.214	1.267	1.275	1.299	1.443	1.304
Standard deviation	.223	.223	.236	.225	.221	.214	.225	.233	.248	.276	.250
Standard deviation of size-adjusted return	.076	.050	.040	.035	.031	.040	.035	.043	.046	.071	--