Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices*

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October 17, 2007

Abstract

This paper analyzes the relationship between employee satisfaction and long-run stock performance. A portfolio of stocks selected by *Fortune* magazine as the "Best Companies to Work For in America" in January 1998 earned over double the market return by the end of 2005, and a monthly four-factor alpha of 0.64%. The portfolio also outperformed industry- and characteristics-matched benchmarks. These findings have two main implications. First, they suggest that employee satisfaction improves corporate performance rather than representing inefficiently excessive non-pecuniary compensation. Second, they imply that the stock market does not fully value intangibles, even when they are made visible by a publicly available survey. This suggests that intangible investment generally may not be incorporated into short-term prices, providing support for managerial myopia theories.

KEYWORDS: Employee satisfaction, market efficiency, short-termism, managerial myopia, human capital
JEL CLASSIFICATION: G14, J28, M14

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1 Introduction

This paper analyzes the relationship between employee satisfaction and long-run stock price performance. A portfolio of firms selected by *Fortune* magazine as the "Best Companies to Work For in America" in January 1998 would have earned average annual returns of 14% per year by the end of 2005, over double the return on the CRSP value-weighted index. Controlling for risk using the Carhart (1997) four-factor model, this translates into a statistically significant monthly alpha of 64 basis points. These figures are similar when the portfolio is rebalanced each year to reflect annual updates of the *Fortune* study, and when controlling for outliers. Risk-adjusted returns continue to be significant when calculated over industry- and characteristics-matched benchmarks, and an employee satisfaction regressor has explanatory power even when controlling for other characteristics known to affect returns. The outperformance is not confined to the 1998-2005 period. The "Best Companies" list was originally published in a book by Levering, Moskowitz and Katz in 1984, and later updated in 1993, before being published by *Fortune* in 1998 and then updated annually. Starting the portfolio in 1984 also leads to significant excess returns over all benchmarks.

These findings contribute to two strands of research. The first is the increasing importance of human capital in the modern corporation. The second is the equity market's failure to fully incorporate the value of intangible assets, which underpins managerial myopia theories.

The traditional firm that pervaded throughout much of the 20th century was predominantly capital intensive and focused on generating cost efficiency through scarce physical assets. By contrast, employees were seen as merely a cost to be minimized, rather than a source of positive value creation. Management practices therefore centered around extracting maximum effort from workers, while minimizing their compensation (see, e.g., Taylor (1912)). Allocating resources to improve employee satisfaction was viewed as irrational as overpaying for any other input.

Management philosophies have dramatically changed over the past fifty years. The current competitive environment places a significantly greater emphasis on quality and innovation, for which human, rather than physical capital, is particularly important (Zingales (2000)). Accordingly, the human relations movement (e.g. Maslow (1943), Hertzberg (1959), McGregor (1960)) has rapidly grown in influence. It recognizes employees as key organizational assets, rather than expendable commodities, and focuses on devising management strategies to develop and retain critical workers.

However, a strategy of building "competitive advantage through people" (Pfeffer (1996)) presents its own difficulties. Unlike physical assets, human capital is inalienable and owned by the workers themselves, not managers or shareholders. An employee may be able to appropriate a large portion of her firm's investment in her human capital by leaving or threatening to leave. Firms may attempt to "tie" workers to their firms through measures such as superior working conditions.[1] However, it is not obvious that such programs are desirable. Similar to

[1] In addition to increasing retention of key human assets, another channel through which employee satisfaction can improve firm value is through increasing on-the-job happiness. This may induce employees to exert greater

excessive wages, they may simply represent inefficiently high compensation, although in a non-pecuniary form. Far from benefiting shareholders, employee-friendly programs may result from the manager's pursuit of private benefits (Cronqvist et al. (2006)), entrenchment (Pagano and Volpin (2005)), or laxity and enjoyment of the quiet life (Bertrand and Mullainathan (2003)). Indeed, Abowd (1989) finds that announcements of pay increases reduce stock market valuations dollar-for-dollar. Gorton and Schmid (2004) show that greater employee involvement reduces the return on assets and the price-book ratio. Diltz (1995) demonstrates no link between shareholder returns and the Council on Economic Priorities employee relations variable, and Dhrymes (1998) finds the same result for KLD Research & Analytics' employee relations measure. [2]

In sum, despite the intuitive logic of the human relations movement, there is little decisive evidence on the value of employee-centric strategies. This void provides the motivation for this paper. To my knowledge, it constitutes the first study that documents positive long-term shareholder value consequences of employee-friendly programs. *If* the association is causal, these findings may rationalize companies' increasing emphasis on their human resources in recent years, by showing that such a focus improves shareholder value, rather than representing unnecessary expenditure.

Even if CEOs are aware that human capital investment improves long-run value, they may still underinvest. This problem has been formalized by a number of managerial myopia models, such as Narayanan (1985), Stein (1988, 1989), and Edmans (2007a, 2007b). The fundamental problem is that such investment is intangible, and so its only immediately observable effect is reduced earnings. Since low profits may stem from poor firm quality, the market may rationally respond by depressing the stock price; fearing such a decline, an equity-aligned manager may inefficiently forgo investment in the first place. Porter (1992) warns that this is an issue of national importance, since the U.S.'s ability to compete successfully on world markets hinges critically on whether its capital allocation system can promote such intangible investment. The problem is frequently voiced by managers themselves: Graham, Harvey and Rajgopal (2005) find that 78% of executives would sacrifice long-term value to meet earnings targets. Since a cause of myopia is the manager's stock price concerns, this problem has likely intensified in recent years owing to increases in equity-based compensation (Hall and Liebman (1998)) and the sensitivity of CEO turnover to the stock price (Kaplan and Minton (2006)).

The invisibility issue may be partially addressed by independent verification of the intangible assets. While the first goal of this study is to investigate the shareholder benefits of employee

effort than "optimal" given the explicit and implicit incentives in his employment contract, i.e. satisfaction may instill the "work ethic" analyzed by Carlin and Gervais (2007).

[2] Peters and Waterman's (1982) influential study argued that "excellent companies" valued their workers and sought to achieve "productivity through people". However, a number of Peters and Waterman's companies subsequently underperformed in the late 1980s (e.g. Atari, IBM, Xerox). Moreover, there are doubts that even their initially superior prior performance was due to employees: they may instead have been a "catch-all" variable for performance differentials that could not be attributed to visible characteristics (Guest (1992)). In a similar vein, many commentators lauded Japan's employee-centric practices (Ouchi (1982)) and predicted that they would lead to Japan overtaking the U.S. in international competition. However, the Japanese economy has underperformed in recent years. Even if such practices are valuable in Japan, they may not be appropriate in the U.S. corporation.

satisfaction, the second objective is to analyze whether intangibles are rapidly impounded into prices, even when made publicly observable. If even independently certified intangibles are not incorporated by the stock market, this would imply even greater disincentives to intangible investment in general, the vast majority of which is not verifiable. This objective explains both my use of a publicly observable variable (*Fortune* inclusion) and my analysis of long-horizon returns. Finding positive event-study reactions to *Fortune* inclusion would not imply that the market underestimates the benefits of employee satisfaction (since it immediately incorporates the news upon release), nor would finding superior returns based on a proprietary measure unavailable to most investors. This explains why my central results focus on the 1998-2005 period, when the lists were widely publicized by *Fortune*, although I extend the sample back to 1984 as a robustness check.

This study confirms the potential importance of managerial myopia by documenting long-run drift to *Fortune* inclusion. Even though the *Fortune* list makes the unobservable (at least partially) observable, the market does not react fully. Note that such underreaction does not imply market irrationality. Given that theory provides no clear predictions on the effect of employee satisfaction, the market may have simply been unaware of the benefits to shareholders. Moreover, caveats to a causal interpretation of the relationship must be noted. One alternative explanation is that employee satisfaction is irrelevant for shareholder value, and it merely proxies for other variables that are positively linked to returns. While I address this hypothesis by controlling for observable characteristics previously found to be associated with superior returns, by their very nature unobservables (such as good management practices) cannot be directly controlled for. A second hypothesis is that employees with private knowledge that their firm has strong future prospects will report higher satisfaction today. While existing studies on employee trading behavior cast doubt on the view that workers have superior information on their firm's future stock price performance, it is not possible to directly rule out this explanation: by its very nature, any satisfaction measure must inevitably stem from employees. If either explanation is valid, my findings would not support the recommendation that stock performance can be directly improved by employee-friendly programs. However, the conclusions on market underreaction and the profitability of a trading strategy would remain.

While the importance of human capital has long been recognized in organization theory, it has only recently been incorporated into theories of the firm in economics and finance. Notable examples include Rajan and Zingales (1998, 2001) and Berk, Stanton and Zechner (2006). These papers focus on a fundamental problem with human assets: that they are free to leave the firm. This issue can be addressed by paying workers in excess of their market wage or granting them a pecuniary share of surplus. However, these models still do not imply a role for employee satisfaction, since it appears an inefficient means of retaining workers compared to cash, just as CEO perquisites are frequently seen as inefficient compensation compared to cash (e.g. Yermack (2006)). Indeed, monetary incentives were viewed as the most effective inducements during the Industrial Revolution, when economic conditions were harsh and workers were primarily concerned with meeting their physical needs, which could be addressed with cash. However, the human relations movement stresses that money is a less powerful incentive nowadays, since most

workers' physical requirements are met and they are increasingly motivated by non-pecuniary factors. Unlike perks, pleasant working conditions cannot be bought with cash, and so it is efficient for the firm to provide them.

Closest to this study is a working paper by Faleye and Trahan (2006). Their main results show that Best Companies exhibit superior contemporaneous accounting performance than benchmark firms. However, the causality of this relationship is unclear: better performing companies may choose to share some of their surplus with employees in the form of higher satisfaction. This paper focuses on the link with future long-term stock-price performance. It is a more direct measure of shareholder value than accounting performance and suffers from fewer reverse causality issues: a better performing company should not exhibit superior future returns as its quality should already be incorporated in the stock price, if intangibles are fully valued. Perhaps even more importantly, one of the key issues with investing in intangible assets is that the benefits may not manifest in accounting performance measures for several years.[3] Hence the accounting tests used in other long-horizon event studies (e.g. Gompers, Ishii and Metrick (2003)) are less applicable here.[4]

A number of other papers find a positive relationship between economic variables and long-run stock performance. Gompers, Ishii and Metrick (2003) show that firms with high shareholder rights significantly outperform those with low rights. Since their shareholder rights index is complex to construct and not based on readily available information, they state that their findings do not necessarily imply market ignorance of the benefits of governance. Also related to governance, Yermack (2006) documents long-horizon underperformance of companies that disclose the use of CEO corporate jets. Hong and Kacperczyk (2006) find that a portfolio of "sin" stocks, such as tobacco and gambling, significantly outperform comparable companies. Their explanation is that social norms may deter certain investors (such as pension plans) from investing in such stocks.

This paper is organized as follows. Section 2 discusses the data and methodology, Section 3 presents the results, and Section 4 concludes.

2 Data and Summary Statistics

[3]Employee satisfaction may show up in stock price performance without affecting accounting performance, as its effects may manifest in non-financial news releases (e.g. the invention of a new product or the filing of a patent).

[4]Faleye and Trahan do consider the event-study reaction to the publication of the *Fortune* list; the focus of this study is long-horizon returns as it wishes to show that the market does not fully incorporate intangibles even after they are made public. Filbeck and Preece (2003) examine the relationship between inclusion in the 1998 *Fortune* list and stock returns from 1987-1999. Interpretations may therefore be affected by reverse causality: employee satisfaction may be caused by strong past performance. They also find that Best Companies do not outperform size- and industry-matched benchmarks. At a conference, Kurtz and Luck (2002) presented results of the Best Companies' performance using the BARRA and Northfield attribution models. This paper uses a broader range of controls for risk and characteristics. Anginer, Fisher and Statman (2007) investigate the returns to another *Fortune* list, "America's Most Admired Companies," and find negative returns to index inclusion, potentially as it is an overvaluation proxy.

My main data source is *Fortune* magazine's list of the "100 Best Companies to Work for in America". (I call firms included in this list "Best Companies" for brevity). The list has been published in late January for every year since 1998. It is arguably the most respected and prestigious measure of a firm's working conditions, receiving significant attention from shareholders, company management, employees and human resource departments.

The list is compiled from two principal sources. Two-thirds of the total score comes from employee responses to a 57-question survey created by the Great Place to Work® Institute in San Francisco. This survey covers topics such as attitudes toward management, job satisfaction, fairness in the workplace, and camaraderie. The remaining one-third of the score comes from the Institute's own evaluation of factors such as a company's demographic makeup, pay and benefits programs, and a company's response to a series of open-ended questions about its culture. The companies are scored in four areas: credibility (communication to employees), respect (opportunities and benefits), fairness (compensation, diversity), and pride/camaraderie (teamwork, philanthropy, celebrations). After evaluations are completed, if significant negative news about a firm's employee relations comes to light, the Institute may exclude that company from the list. It is important to note that *Fortune* has no involvement in the company evaluation process, else it may have incentives to bias the list towards advertisers (Reuter and Zitzewitz (2006)).

Table 1 details the number of companies in the *Fortune* list with stock returns available through CRSP in each year. The table also gives the number of firms added to and dropped from the list.

The publication date of the *Fortune* magazine issue containing the Best Companies list is typically in mid-to-late January. In addition, the issue reaches the newsstands one week before the publication date. Therefore, if the stock market recognizes the importance of employee satisfaction and fully incorporates it into prices, the contents of the list should be impounded into prices by at least the start of February. Therefore, February 1 is the date for formation and rebalancing of the portfolios.

The tests focus on long-horizon returns for two reasons. First, event study returns are unlikely to capture the full economic benefits of satisfied employees. Since the market does not fully respond to announcements of tangible financial earnings (Bernard and Thomas (1989)), they are unlikely to fully incorporate news about intangibles. This scenario would lead to results being understated. Conversely, considering only short-horizon returns might lead to overstated results. Even if employee satisfaction is irrelevant for performance, the market might erroneously believe that it is important (especially given companies' increasing focus on this variable) and irrationally react to *Fortune* list inclusion. Gilbert et al. (2006) find that the market reacts to a meaningless variable that investors erroneously pay attention to, and Huberman and Regev (2001) document a firm-level case of reaction to non-information.

The second reason for studying long run returns is that my objective is not only to examine the importance of employee satisfaction, but also to investigate whether stock market valuations fully incorporate intangibles. Event-study abnormal returns (with no drift) would not imply non-incorporation, since employee satisfaction is particularly difficult to observe before

the release of the *Fortune* list. Positive drift indicates that the market does not fully value intangibles, even when such intangibles are made visible by a study as widely disseminated as the *Fortune* one, implying that intangibles more generally are not impounded into current stock prices. It would also suggest a profitable and actionable trading strategy.

On February 1, 1998, I form an equally-weighted portfolio containing the 68 publicly traded "Best Companies" in that year, and measure the returns to this portfolio from February 1998 to January 1999. The portfolio is reformed on February 1, 1999 to contain the 67 firms included in the new *Fortune* list, and returns are calculated from February 1999 to January 2000. This process is repeated until December 2005 and I call this "Portfolio I".

If a "Best Company" only becomes publicly traded mid-way through the year (e.g. Goldman Sachs in 1999), its returns are included from the month in which it becomes public (i.e. as if the portfolio bought the company's shares in an IPO).[5] Portfolio I thus contains 69 companies from March 1998, since Steelcase became public in March. If a "Best Company" is acquired by another "Best Company", its delisting return is used in its final month and only the parent is included in the portfolio going forwards to avoid double counting. If a "Best Company" is acquired by a company not on the list, I remove it from the portfolio. (Results are unchanged if I also include the parent's returns going forward, under the rationale that at least part of the merged entity enjoys superior employee satisfaction.) Including the 1984 and 1993 lists (see Section 3.3), 6 Best Companies have only ADRs in the U.S. The results include these companies, since an investor constrained to hold U.S. shares would have been able to invest in such firms. The results are slightly stronger when excluding these companies.

I run all my tests on three other portfolios. Portfolio II does not rebalance the portfolio each year: it simply calculates the returns to the original 68 Best Companies from February 1998 to December 2005. This portfolio represents the simplest trading strategy, as no rebalancing is required. Portfolio III adds to the original 1998 portfolio any new companies which appear on subsequent lists, but does not drop any firm that is later removed. The motivation is that some companies may have dropped out of the Top 100, but still exhibited superior employee satisfaction than the average firm (e.g. now be in the Top 150). Portfolio IV includes only companies dropped from the list. Specifically, it is created on February 1, 1999 and includes any companies that were in the 1998 list but not in the 1999 list. On February 1, 2000, any companies that were in the 1999 list but not in the 2000 list are added, and so on. If a firm is later added back to the list, it is removed from Portfolio IV. The purpose of this portfolio will be explained shortly.

Table 2 presents summary statistics on the original 68 "Best Companies". The mean market capitalization is $22 billion, with the median being a significantly lower $5 billion. One notable statistic is that 17 companies do not pay dividends. The 44 that do have an average payout rate of 1.7%, leading to an average yield of 1.2% across the sample.[6] This low payout rate

[5]The results are little changed if the company is included in the month after it becomes public, to ensure that the portfolio is not simply capturing any initial IPO underpricing.

[6]Since the dividend yield is calculated each July and held constant through the following June (see Section 3), companies need 1996 Compustat data to be included. This data is missing for 4 companies. In addition, three firms (Glaxo, Honda and Shell) are excluded from the table as they are ADRs: while their Compustat

is consistent with significant investment in human capital. The average market-book ratio is a high 5 and the mean proportion of total assets accounted for by intangibles is only 5%. Together, these results suggest that these companies have little human capital on the balance sheet. This may result from accounting standards hindering capitalization of this asset. Nearly all investment in human capital is expensed, which may make it difficult for the market to value such investment. Similarly, note that in any given year, approximately one-third of the Best Companies are private. This is consistent with the view that it is easier to develop human capital away from the constant scrutiny of the stock market.

The most common industries are consumer goods (7 companies), financial services (6), software (5), pharmaceuticals (5), hardware (4), and electronic equipment (4). Human capital is plausibly an important input in all of these industries, with the link less obvious perhaps only for consumer goods.

3 Analysis and Results

3.1 Hypothesis

My principal hypothesis is that Portfolios I-III generate significant excess returns over relevant benchmarks, which are described in the next section. This is a joint test of two sub-hypotheses: employee satisfaction is positively associated with corporate performance, and the market fails to fully incorporate the value benefits of employee satisfaction even when the *Fortune* list is published. I also predict that Portfolio IV performs worse than Portfolios I-III, since the former contains companies outside the Top 100 for employee satisfaction. Whether its returns are also negative depends on market incorporation of intangibles. If the market at all times capitalizes the value of employee satisfaction, the removal of a company from the list signals that this variable has declined. Therefore, under the assumption that satisfaction improves performance, Portfolio IV should earn negative returns.

However, if employee satisfaction is important but not incorporated by the market, such a prediction is not generated. In the extreme, if the *Fortune* list is completely ignored, employee satisfaction only feeds through to returns when its benefits manifest in future tangible news releases and earnings announcements. Hence the abnormal return of firm i depends on its level of employee welfare compared to the average firm, rather than the market's previous assessment of firm i's level of welfare. If firm i is outside the Top 100, it may still exhibit above-average satisfaction (e.g. be in the Top 150) and thus generate superior abnormal returns.

In sum, my hypotheses are the following:

H1: Portfolios I-III outperform their benchmarks.

H2: Portfolio IV underperforms Portfolios I-III, but does not underperform its benchmark.

data is for the whole firm, their share data is only for the ADRs. I therefore only have payout data for 61 firms.

3.2 Results

Table 3 presents the annual returns to each portfolio and the market benchmark. Consistent with H1, Portfolio I generates an average annual return of 13.8% over the period, over double the market return of 5.6%. Portfolios II and III display similar outperformance, with Portfolio II generating a slightly higher return of 14.2%. While Portfolio I might be expected to perform most strongly, since it reflects the most current *Fortune* list, it underperformed Portfolio II in 2001 (and thus overall) due to its hi-tech exposure.

Moreover, the outperformance of Portfolios I-III is consistent, with all three portfolios beating the market in 7 of the 8 years. This includes 2001 and 2002 when the market declined – the portfolios continue to generate superior returns in weak market conditions. While Portfolio II shows that a simple buy-and-hold strategy generates superior returns when initiated in February 1998, unreported results also document significant outperformance for a buy-and-hold strategy regardless of which year it is started. Consistent with H2, Portfolio IV earns an average annual return of 10.1%, 3-4 percentage points below the returns of the first three portfolios but still comfortably above the market.

Table 4 documents monthly returns in excess of a benchmark portfolio. Three benchmark portfolios are chosen. The first is the market portfolio, taken to be the CRSP value-weighted index. The second is an industry-matched portfolio using the 49-industry classification of Fama and French (1997). This is to ensure that outperformance is not simply because the Best Companies operated in industries that enjoyed strong performance. It also partially controls for risk, although additional controls are introduced shortly. The third is the characteristics-adjusted benchmark used by Daniel et al. (1997) and Wermers (2004)[7], which matches each stock to a portfolio of stocks with similar size, book-market ratio and momentum. This is to ensure that the outperformance is not simply because the Best Companies are exploiting the size, value and/or momentum anomalies. This adjustment also partially controls for risk.

The benchmark-adjusted returns reinforce the results in Table 3. Portfolios I–III outperform both all three benchmarks by 45-70 basis points, with benchmark adjustment only slightly reducing the returns. Portfolio IV also outperforms, but by a lower margin.[8]

An alternative explanation is that employee satisfaction is irrelevant for stock returns, and instead that outperformance is due to risk. I therefore run monthly regressions of portfolio returns on the four Carhart (1997) factors, as specified by equation (1) below:

$$R_{it} = \alpha + \beta_{MKT} MKT_t + \beta_{HML} HML_t + \beta_{SMB} SMB_t + \beta_{MOM} MOM_t + \varepsilon_{it} \qquad (1)$$

where:

R_{it} is the return on Portfolio i in month t, either in excess of the risk-free rate (taken from Ibbotson Associates), the return on the industry-matched portfolio, or the return on the characteristics-matched portfolio.

[7] The benchmarks are available via http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm

[8] The excess returns over the market for Portfolio IV are closer to the other three portfolios than the CAGR in Table 3, since the former reflects a simple average rather than compounding.

α is an intercept that captures the abnormal risk-adjusted return, and is the key variable of interest.

MKT_t is the return on the CRSP value-weighted index in excess of the risk-free rate. This represents a market factor.

HML_t is the return on a zero-investment portfolio which is long (short) high (low) book-market stocks. This represents a value factor.

SMB_t is the return on a zero-investment portfolio which is long (short) small (large) stocks. This represents a size factor.

MOM_t is the return on a zero-investment portfolio which is long (short) past winners (losers). This represents a momentum factor.

ε_{it} is a generic error term which is uncorrelated with the independent variables.

All the regressors are taken from Ken French's website. There remains considerable academic debate as to whether the four factors proxy for economic risk or mispricing. I do not take a stance on this issue as the alternative hypothesis can equivalently be stated in terms of omitted variables bias. Employee satisfaction may be itself irrelevant but correlated with firm attributes that are positively related to stock returns – either because of risk or mispricing. The alpha in equation (1) reflects the excess return compared to passive investment in a portfolio of the factors. It is conservative, but not necessarily superfluous, to subtract the returns on the Daniel et al. (1997) benchmarks before running the four-factor regression, as characteristics are different from covariances (Daniel and Titman (1997)). Standard errors are calculated using Newey-West (1987), which allows for ε_{it} to be heteroskedastic and serially correlated; results are very similar if spherical standard errors are assumed.

Table 5 presents the results. Portfolios I-III all generate alphas of at least 0.4%, regardless of the benchmark, which are statistically significant at the 1% level. Portfolio IV earns positive alphas which is significant at the 10% level in one specification. Taken together with the findings that suggest employee satisfaction affects corporate performance, the positive alphas of Portfolio IV further imply non-incorporation. Note that, in many of the specifications, the coefficient on the momentum factor is significantly negative. This is inconsistent with the idea that good stock performance leads employees to respond positively to the survey, and that the Best Companies simply capture a momentum effect.

In untabulated results, the outperformance is even stronger when the portfolio contains only the companies in the Top 50 of the *Fortune* list each year. The annualized return to this portfolio is 17.2%, representing a four-factor alpha of 86 basis points. This is consistent with the classification of these companies as exhibiting even higher employee satisfaction. Also untabulated are the results to value-weighted portfolios, which are similar (for example, a value-weighted Portfolio I is significant at the 5% level in all specifications). The tabulated results focus on equal-weighted returns for brevity, as these are most commonly used in the literature on cross-sectional anomalies. The Daniel et al. (1997) benchmarks ensure that I am not simply rediscovering the size effect.

3.3 Further Robustness Tests

The above subsection showed that the Best Companies' outperformance was not due to covariance with the Carhart (1997) factors nor to selecting industries or characteristics associated with abnormal returns. This subsection conducts further robustness tests.

To test whether the results are driven by outliers, I winsorize the top 10% and bottom 10% of returns. The winsorization is conducted by portfolio and by month: for example, the returns of the top decile of firms in Portfolio I in June 2000 are replaced by the 90th percentile return among all firms in Portfolio I in June 2000. Table 6 illustrates the four-factor alphas for the winsorized portfolios. The alphas are significant for Portfolios I-III, regardless of the benchmark, and insignificant for Portfolio IV. Hence the results of Table 5 do not appear to be driven by outliers. (The results in other tables are also robust to winsorization).

Another concern is that the time period is short, since the *Fortune* lists only started in 1998. Typically, small samples bias the results against finding statistical significance, but this paper is able to document significant results despite such a small time series. A stronger issue is that the outperformance may result from the 1998-2005 period being anomalous. I therefore extend the sample by including the companies in the "100 Best Companies to Work For in America" book. This was published in March 1984 by Levering, Moskowitz and Katz, and updated in February 1993 by Levering and Moskowitz.[9] From 1998, *Fortune* magazine started to feature the lists which substantially enhanced their publicity. Since a core objective of this paper is to test whether intangibles are incorporated into prices even when made public by a widely available survey, the results thus far have focused on the 1998-2005 period during which *Fortune* published the lists. However, it is legitimate to extend the sample back to 1984 to evaluate the robustness of the second principal result of this paper, the positive association between satisfaction and returns.

Table 7 documents the results. The portfolios are formed analogously to the main paper: for example, Portfolio I is formed in April 1984, updated in March 1994 and thereafter every February from 1998-2005. The results confirm the Best Companies' outperformance over all benchmarks, with Portfolio I displaying statistical significance at the 1% level in all specifications. Compared to Table 5, the alpha drops slightly to around 30 basis points per month, or 4% per year, but remains economically significant. The average annualized return exceeds 16%, compared with the market's return of 12%, and the portfolio outperformed the market in 19 out of the 22 years from 1984-2005. While Portfolios III and IV also generate highly significant alphas, Portfolio II is surprisingly marginally insignificant (although a value-weighted Portfolio II is significant at the 5% level in all specifications). This is because the 1984 list contained firms such as Polaroid, Delta Airlines, Dana and Armstrong that did not feature in the 1998 list, and suffered very weak performance from 1998 onwards.[10] In sum, the extension of the time

[9] These dates are for the hardback edition. The paperback editions were published approximately a year later, but it is the hardback publication date that is relevant as investors became aware of the contents of the list once it was released.

[10] The high alphas for Portfolio IV (relative to the other portfolios) are because it exists only from 1993. While Portfolios I-III outperformed all benchmarks from 1984-1992, the outperformance is even greater from 1993-2005, and thus the alphas are lowered by including 1984-1992. Focusing on the 1993-2005 period for all portfolios,

series confirms that an investor could have made significant risk-adjusted returns by investing in the Best Companies in the 1984 list and rebalancing his portfolio with each update.

An additional alternative hypothesis is that the explanatory power of *Fortune* list inclusion stems only from its correlation with firm characteristics associated with superior returns other than the size, book-to-market or momentum variables already studied in Table 4. Calculating the returns on a benchmark portfolio with similar characteristics is only feasible when the number of characteristics is small, else it is difficult to form a benchmark. I therefore use a regression approach to control for a wider range of characteristics than the three studied by Daniel et. al (1997). Specifically, I run a Fama-MacBeth (1973) estimation of equation (2) below:

$$R_{it} = a_t + b_t X_{it} + c_t Z_{it} + \varepsilon_{it} \tag{2}$$

where:

R_{it} is the return on stock i in month t, either unadjusted or in excess of the return on the industry-matched portfolio.

X_{it} is a dummy variable that equals 1 if firm i was included in the most recent *Fortune* survey.

Z_{it} is a vector of firm characteristics.

ε_{it} is a generic error term which is uncorrelated with the independent variables.

The firm characteristics included in Z_{it} are taken from Brennan, Chordia and Subrahmanyam (1998). These are as follows:

$SIZE$ is the natural logarithm of i's market capitalization at the end of month $t-2$.

BM is the natural logarithm of i's book-to-market ratio. This variable is recalculated each July and held constant through the following June.

YLD is the ratio of dividends in the previous fiscal year to market capitalization measured at calendar year-end. This variable is recalculated each July and held constant through the following June.

RET2-3 is the natural logarithm of the cumulative return over months $t-3$ through $t-2$.

RET4-6 is the natural logarithm of the cumulative return over months $t-6$ through $t-4$.

RET7-12 is the natural logarithm of the cumulative return over months $t-12$ through $t-7$.

$DVOL$ is the natural logarithm of the dollar volume of trading in security i in month $t-2$.

PRC is the natural logarithm of i's price at the end of month $t-2$.

The results are presented in Table 8 for the core period of 1998-2005 (the results are similar for the extended period). For both the unadjusted and industry-adjusted specifications, the Best Companies variable is statistically and economically significant. Consistent with the point estimates of previous tables, *Fortune* inclusion is associated with an abnormal return of over

the alphas for Portfolios I-III are higher than for Portfolio IV by a similar margin to the outperformance in 1998-2005 documented in Table 5.

50 basis points.[11] This suggests that the Best Companies' outperformance does not result from their correlation with the observable characteristics studied by Brennan et al. (1998).

3.4 Remaining Caveats

The existing evidence documents a robust empirical relationship between *Fortune* inclusion and future stock price performance. The hypothesis that motivated the study is that employee satisfaction causes superior corporate performance, for instance by increasing on-the-job productivity or by facilitating the retention of key employees. However, the results also admit a number of alternative explanations. Caution must therefore be used when interpreting the results, particularly if attempting to make prescriptions for human resource strategies.

One alternative hypothesis is that the link between satisfaction and returns arises because a third unobservable variable (e.g. good management practices) causes both. In other words, the explanatory power of *Fortune* inclusion only arises because it is correlated with an omitted variable. While the analysis in Table 8 ruled out correlation with observable determinants of returns, by their very nature unobservables cannot be used as regressors. A standard solution is to introduce firm fixed effects to absorb the unobservables and identify purely on within-firm changes in the variable in question. Unfortunately, this approach is not appropriate here because there is little within-firm variation in *Fortune* inclusion: many firms remain in the list for several years (and some indeed for the entire period), and a firm removed from the list may still exhibit significantly above-average satisfaction (e.g. be in the Top 150). In addition, a fixed effects approach requires the unobservables to be constant over time, but a change in employee satisfaction could be caused by changes in management practices.

A second explanation is reverse causality. If employees have private information about their firm's expected future stock price performance, those with positive information will plausibly be more likely to report higher satisfaction. Since *any* measure of satisfaction must come from workers (either directly through a survey, or indirectly by studying behavior), it is difficult to think of other measures that would be immune to this interpretation. However, this hypothesis can be evaluated indirectly by using prior research on employee trading behavior. Benartzi (2001) shows that employees make incorrect decisions when allocating their 401(k) accounts to company stock, and Bergman and Jenter (2007) find that firms are able to lower total compensation by granting their workers overvalued options in lieu of salary. Both of these studies are inconsistent with the notion that employees have superior information about future stock returns.[12]

If the results were entirely driven by a combination of these two reasons, then satisfaction has no causal effect on returns and the introduction of employee-friendly programs (without altering other management practices) would have no impact. However, other conclusions from

[11] *SIZE* and *BM* enter with the usual sign, but are statistically insignificant. This is because of the large number of regressors. In univariate regressions, both are highly statistically significant.

[12] Note that in studies linking satisfaction to past stock returns or contemporaneous accounting performance, a reverse causality argument does not assume that employees have private information, and so cannot be ruled out by these two papers.

this paper would be unaffected. It still remains that the market does not incorporate intangibles (be they satisfaction or good management) even when made publicly available, and that an investor could have earned significant risk-adjusted returns by trading on the *Fortune* list.

4 Conclusion

This paper documents statistically and economically significant long-horizon returns to portfolios containing companies with high employee satisfaction, even when controlling for industries, factor risk or a broad set of observable characteristics. These findings imply that the market fails to incorporate intangible assets fully into stock valuations - even if the existence of such assets is verified by a widely respected survey. This suggests that the market may have even greater difficulty in valuing other forms of intangible investment, and provides empirical support for theoretical models of managerial myopia.

The results are also consistent with the view that employee satisfaction is positively related to corporate performance, rather than representing inefficiently excessive non-pecuniary compensation. However, there are other interpretations of this association which the data cannot entirely rule out. The economic magnitudes documented by the paper suggest that future research that successfully identifies the underlying causes of superior performance may have very important implications. If superior employee satisfaction caused even a portion of the 64 basis point monthly abnormal return, then employee-friendly programs can substantially improve shareholder value.

Table 1: Summary Statistics

The second column details the number of Best Companies in the relevant year that had returns available on CRSP at any point during the year (from February to January). The third column gives the number of new companies added to the *Fortune* list in that year. The fourth column contains the number of companies on the previous year's *Fortune* list which no longer feature in the current year.

Year	Best Companies	Added	Dropped
1998	69		
1999	67	26	28
2000	61	21	27
2001	56	16	21
2002	56	14	14
2003	62	14	8
2004	57	11	16
2005	58	11	10

Table 2: Summary Characteristics

This table illustrates summary statistics for the 68 companies in *Fortune* magazine's 1998 "100 Best Companies to Work For in America" list that were public on February 1, 1998. All data are of the end of January 1998 and taken from CRSP and Compustat. To calculate book equity for the Market/Book ratio, I start with stockholders' equity (Compustat item 216) if it is not missing. If it is missing, I use total common equity (item 60) plus preferred stock par value (item 130) if both of these are present. Otherwise, I use total assets (item 6) minus total liabilities (item 181), if both are present. To obtain book equity, I subtract from shareholders' equity the preferred stock value, where we use redemption value (item 56), liquidating value (item 10), or carrying value (item 130), in that order, as available. Finally, if not missing, I add in balance sheet deferred taxes (item 35) to this book-equity value, and subtract the FASB106 adjustment (item 330). The last three items are based on Compustat data for 1996. They are missing for 4 companies that were not traded in 1996. In addition, they are excluded for 3 companies for which only the ADRs are traded.

	Mean	Std. Dev.	Min	Max
Market Cap ($ bn)	21.51	39.78	0.03	204.59
Price ($)	50.99	25.48	5.38	127.56
Volume (m)	34.27	71.67	0	406.38
Dividend yield (%)	1.22	1.20	0	5.97
Market/book	4.89	4.81	-3.14	29.10
Intangibles as a % of total assets (%)	5.01	7.50	0	28.88

Table 3: Annual Portfolio Returns

This table documents the annual returns of the four portfolios and the CRSP value-weighted portfolio. The 1999-2005 figures are for January-December and the 1998 figures are for February-December (non-annualized). CAGR represents the Compound Annual Growth Rate (annualized) for February 1998-December 2005 for Portfolios I-III, and February 1999-December 2005 for Portfolio IV.

	I	II	III	IV	CRSP VW
1998	20.90%	22.42%	20.90%		21.74%
1999	36.20%	24.08%	30.19%	12.43%	25.26%
2000	9.66%	17.95%	10.27%	9.91%	-11.04%
2001	-7.11%	2.25%	-0.43%	6.53%	-11.27%
2002	-13.53%	-10.68%	-17.26%	-20.60%	-20.84%
2003	45.54%	38.21%	47.75%	49.59%	33.15%
2004	22.72%	18.64%	18.62%	15.59%	13.00%
2005	7.52%	6.82%	7.86%	8.11%	7.31%
CAGR	*13.81%*	*14.23%*	*13.39%*	*10.17%*	*5.59%*

Table 4: Monthly Portfolio Returns

This table documents the average excess monthly returns to the four portfolios. The second row gives the excess returns over the CRSP value-weighted index. The third row gives the excess returns over a benchmark portfolio constructed using the 49 Fama-French (1997) industries corresponding to the companies in the portfolio. The fourth row gives the excess returns over a benchmark portfolio constructed using the Daniel et al. (1997) characteristics of size, book-to-market and momentum. The sample period is February 1998-December 2005.

	I	II	III	IV
Excess return over market	0.68%	0.66%	0.65%	0.64%
Excess return over industry-matched portfolio	0.58%	0.46%	0.52%	0.45%
Excess return over characteristics-matched portfolio	0.56%	0.54%	0.48%	0.34%
Number of observations	95	95	95	83

Table 5: Risk-Adjusted Returns

This table documents the results of monthly regressions of portfolio returns on the four Carhart (1997) factors, MKT_t, HML_t, SMB_t, MOM_t. The regression is specified in equation (1). The dependent variable is the portfolio return less either the risk-free rate, the industry-matched portfolio return, or the characteristics-matched portfolio return. The regressors are the returns to zero-investment portfolios designed to capture market, value, size, and momentum effects. The alpha is the excess risk-adjusted return. The sample period is February 1998-December 2005.

	I	II	III	IV
Panel A (excess returns over risk-free rate)				
α	0.64	0.61	0.61	0.49
	(3.72***)	(3.29***)	(3.77***)	(1.65)
β_{MKT}	1.12	0.98	1.11	1.06
	(20.87***)	(21.73***)	(29.86***)	(17.63***)
β_{HML}	0.10	0.24	0.15	0.22
	(1.69*)	(4.37***)	(3.18***)	(2.35**)
β_{SMB}	0.13	0.11	0.17	0.23
	(1.82*)	(1.92*)	(3.86***)	(2.81***)
β_{MOM}	-0.11	-0.11	-0.15	-0.23
	(2.99***)	(2.88***)	(5.10***)	(5.18***)
Panel B (excess returns over industry-matched portfolios)				
α	0.46	0.44	0.45	0.36
	(3.32***)	(3.51***)	(3.83***)	(1.52)
β_{MKT}	0.12	-0.06	0.07	-0.01
	(2.75***)	(1.63)	(2.22**)	(0.14)
β_{HML}	0.08	0.07	0.07	0.08
	(1.58)	(1.60)	(2.22**)	(0.94)
β_{SMB}	0.14	0.09	0.16	0.18
	(2.91***)	(2.05**)	(5.13***)	(2.34**)
β_{MOM}	-0.26	-0.04	-0.06	-0.13
	(0.98)	(1.73*)	(3.14***)	(2.85***)

Table 5: Risk-Adjusted Returns (cont'd)

	I	II	III	IV
Panel C (excess returns over characteristics-matched portfolios)				
α	0.54	0.54	0.51	0.39
	(3.84***)	(3.66***)	(3.90***)	(1.75*)
β_{MKT}	0.14	0.00	0.09	0.03
	(3.38***)	(0.11)	(2.92***)	(0.49)
β_{HML}	0.82	0.09	0.02	-0.04
	(1.81*)	(1.51)	(0.43)	(0.48)
β_{SMB}	-0.02	0.00	0.05	0.13
	(0.43)	(0.06)	(1.68*)	(1.79*)
β_{MOM}	-0.06	-0.05	-0.10	-0.15
	(2.40**)	(1.55)	(3.39***)	(3.46***)
Number of observations	95	95	95	83

*: Significant at the 10% level; **: Significant at the 5% level; ***: Significant at the 1% level

Table 6: Risk-Adjusted Returns of Winsorized Portfolios

This table documents the results of monthly regressions of portfolio returns on the four Carhart (1997) factors, MKT_t, HML_t, SMB_t, MOM_t. The regression is specified in equation (1). For each portfolio and for each month, the returns of the constituent stocks are winsorized at the 10% and 90% levels. The dependent variable is the winsorized portfolio return less either the risk-free rate, the industry-matched portfolio return, or the characteristics-matched portfolio return. The regressors are the returns to zero-investment portfolios designed to capture market, value, size, and momentum effects. The alpha is the excess risk-adjusted return. The sample period is February 1998-December 2005.

	I	II	III	IV
α over risk-free rate	0.52	0.43	0.40	0.22
	(2.97***)	(2.33**)	(2.67***)	(0.90)
α over industry	0.34	0.26	0.25	0.10
	(2.49**)	(2.05**)	(2.32**)	(0.49)
α over characteristics	0.46	0.34	0.32	0.18
	(3.25***)	(2.43**)	(2.72***)	(0.86)
Number of observations	95	95	95	83

*: Significant at the 10% level; **: Significant at the 5% level; ***: Significant at the 1% level

Table 7: Risk-Adjusted Returns from 1984

This table documents the results of monthly regressions of portfolio returns on the four Carhart (1997) factors, MKT_t, HML_t, SMB_t, MOM_t. The regression is specified in equation (1). The dependent variable is the winsorized portfolio return less either the risk-free rate, the industry-matched portfolio return, or the characteristics-matched portfolio return. The regressors are the returns to zero-investment portfolios designed to capture market, value, size, and momentum effects. The alpha is the excess risk-adjusted return. The sample period is April 1984-December 2005.

	I	II	III	IV
α over risk-free rate	0.34	0.18	0.29	0.37
	(3.45***)	(1.61)	(3.29***)	(2.75***)
α over industry	0.22	0.13	0.20	0.27
	(2.97***)	(1.33)	(3.06***)	(2.03**)
α over characteristics	0.25	0.11	0.20	0.28
	(2.93***)	(1.08)	(2.56***)	(2.21**)
Number of observations	95	95	95	83

*: Significant at the 10% level; **: Significant at the 5% level; ***: Significant at the 1% level

Table 8: Characteristics Regressions

This table documents the results of monthly regressions of individual stock returns on a *Fortune* list inclusion dummy and the characteristics used in Brennan, Chordia and Subrahmanyam (1998). *SIZE* is the natural logarithm of the firm's market capitalization (in billions) in month $t-2$. *BM* is the natural logarithm of the firm's book-to-market ratio as of the calendar year-end before the most recent June. *YIELD* is the firm's dividend yield as of the calendar year-end before the most recent June. *RET2-3*, *RET4-6* and *RET7-12* are the natural logarithm of the compounded returns in, respectively, month $t-3$ to month $t-2$, month $t-6$ to month $t-4$, and month $t-12$ to month $t-7$. *DVOL* is the dollar trading volume (in millions) in month $t-2$. *PRC* is the price at the end of month $t-2$. The sample period is February 1998-December 2005.

	Raw	Industry-Adjusted
Best Company	0.60	0.57
	(2.51**)	(2.71***)
SIZE	-0.00	-0.03
	(0.01)	(0.21)
BM	0.11	0.10
	(1.00)	(1.18)
YIELD	-0.02	-0.01
	(1.52)	(1.27)
RET2-3	0.01	0.06
	(1.67)	(0.02)
RET4-6	0.01	0.05
	(2.67***)	(0.03)
RET7-12	0.01	0.03
	(2.53***)	(0.02)
DVOL	1.65	1.40
	(0.10)	(0.03)
PRC	-0.56	-0.45
	(2.19**)	(1.81*)

*: Significant at the 10% level; **: Significant at the 5% level; ***: Significant at the 1% level

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