# The Mispricing of Socially Ambiguous Grey Stocks

By Swee-Sum Lam, Weina Zhang, Gabriel Henry Jacob

## Executive Summary

It is not surprising to see that firms that have more socially responsible actions ("good" firms) are rewarded by a higher market return of 3% per calendar year compared to firms that do not engage in socially responsible or irresponsible actions ("neutral" firms). On the contrary, firms that are more socially irresponsible ("bad" firms) are not penalized by a negative return compared to "neutral" firms. A more important question remains: How does the market value those firms that engage in both socially responsible and irresponsible actions simultaneously? We term these socially ambiguous firms as "grey" firms.

In reality, many firms are taking on both socially responsible and irresponsible actions. A visible example includes Altria, which is a tobacco company with a strong CSR component such as community building activities. Yet the tobacco industry is deemed a "sin" industry by socially responsible investors. How then would market value these "grey" firms? Are firm's socially responsible and irresponsible actions valued the same?

Using the KLD database that rates both the socially responsible actions and irresponsible actions of each single firm, we manage to disentangle the valuations of responsible and irresponsible actions. Our results show that the "grey" firms are valued higher for their redeeming socially responsible actions. The annual return is about 3.2% higher for "grey" firms when they are compared to "bad" firms (which mostly engage in socially irresponsible actions). The reward is even higher for "grey" firms compared to "neutral" firms, at 3.6%. These results imply that it pays off for a firm in a "sin" industry to engage in socially responsible actions. At least, doing "good" is better than "doing nothing" or "purely doing bad".

Exploring which aspects of the socially responsible actions that firms should engage in, we find that the "Environment" and "Community" related socially responsible actions are the key drivers for the higher return. This finding is intuitive as the benefits to the environment and community are more visible to the public. This is the first study that reveals that financial market and investors are forgiving and they recognize the "good" performed by "grey" firms.

# The Mispricing of Socially Ambiguous Grey Stocks

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## Abstract

The study examines how stock market prices the stocks of socially ambiguous "Grey" firms. These are firms that are socially responsible in certain *corporate social responsibility* (CSR) dimensions while being socially irresponsible in the same or other dimensions. Using the firm data from 1992 to 2011, we find that the "Grey" portfolio earns an annual abnormal return up to 3.6 percent relative to "Neutral" portfolio that consists of neither socially responsible nor irresponsible firms. Interestingly, "Community" and "Environment" sub-dimensions of CSR are the main drivers for the overpricing. The over-pricing phenomenon is robust and is not driven by small firms, the "Sin" stocks or "Controversial" industries. Overall, our results suggest that "Grey" firms are significantly mispriced by the market compared to their "Neutral" peers, plausibly due to the ambiguity in their social performance.

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*"Let us not lose heart in doing good, for in due time we will reap if we do not grow weary."*

*– Galatians 6:9*

# 1. Introduction

One of the most exciting developments in the financial community in last two decades has been the growing interest in *socially responsible investment* (SRI). SRI investors are concerned not just with financial performance but also the non-financial dimensions of corporate performance, such as the impact on the environment, relationship with the community and corporate governance. The Social Investment Forum (SIF) reports that in 2012, total asset under management (AUM) in the United States in the SRI category amounts to USD3.74 trillion or 11.2 percent of the all assets under professional management. This represents a 22 percent growth in two years from USD3.07 trillion in 2010. The number of socially responsible mutual funds has also grown from 55 funds in 1995 to 303 funds in 2012 (Social Investment Forum, 2012).

In reality, it is challenging to categorize all corporates into two dichotomies such as "socially responsible" or "socially irresponsible". There are many firms that are considered as socially irresponsible firms yet they perform many socially responsible actions to redeem themselves. For example, Altria is a tobacco company, which is conventionally categorized as a socially irresponsible firm. However, a closer examination reveals that Altria invests a lot of the company's resources in socially responsible practices. The company consistently invests in charitable activities for the community, takes good care of its employees, maintains workforce diversity, practices sustainable agriculture and adopts "green" practices (Altria Group Inc, 2013). Altria publishes a Corporate Responsibility Progress Report annually to help outsiders keep track of its corporate responsibility programs. In 2012, it was ranked fourth among all companies in

social responsibility by Fortune magazine (CNN Money, 2012). If we count the number of socially responsible or irresponsible practices, Altria cannot be labeled clearly as a socially "responsible" or "irresponsible" firm. It scores high in both socially responsible and irresponsible practices, which makes it socially ambiguous.

In this paper, we examine how stock market prices these socially ambiguous firms. The existing theories such as *stakeholder theory* and *investor recognition theory* predict that socially responsible firms have higher valuation, lower returns, and lower risk and vice versa for socially irresponsible firms.[1] But there is no theory that predicts how the market prices the stocks of these socially ambiguous firms. Our paper embarks on this empirical exploration.

We define "Grey" firms as socially ambiguous firms. These are firms that are both socially responsible and irresponsible all at the same time. KLD Research & Analytics, Inc. measures social performance of individual firms through surveying over 12,000 global news sources and is the mostly widely used academic database (e.g., Kempf and Ostoff, 2007; Galema, Plantinga and Scholtens, 2008; Statman and Glushkov, 2009). In this study, we label a firm as a "Grey" firm if it scores highly in both social strengths and social concerns according to KLD, drawing from the top 50 percentile of the respective distributions. We compare this category of firms to the other three categories of firms, namely "Good", "Bad", and "Neutral" firms. "Good" firms has a higher than median KLD score in social strengths but a lower than median KLD

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[1] The *stakeholder theory* predicts that socially responsible firms may be subjected to lower social or environment risk than socially irresponsible firms (e.g., Waddock and Graves, 1997; Feldman, Soyka and Ameer, 1997; Sharfman and Fernando, 2008). Hence, these firms are less prone to future explicit claims from its stakeholders. The reduced risk can also arise from the reduction of the deadweight costs associated with distress situations (e.g. legal costs, loss of key employees, astronomical refinancing costs, and tighter terms from suppliers). Oikonomou, Brooks and Pavelin (2012) find supporting evidence by showing a negative relation between systematic risk and a measure of social responsibility of S&P500 firms. The *investor recognition theory* predicts that when a big segment of investors are interested in investing in socially responsible companies, such demand would result in higher valuations and thus lower returns on these socially responsible companies. Consistent with this prediction, several recent empirical studies have documented that stocks of socially responsible companies enjoy higher valuations and lower returns (e.g., Renneboog, Horst and Zhang, 2008; Galema, Plantinga and Scholtens, 2008; Ghoul, Guedhami, Kwok and Mishra, 2011; Bouslah, Kryzanowski and M'Zali, 2013).

score in social concerns. "Bad" firms score in the low 50 percentile of the social strengths and in the top 50 percentile of the social concerns. "Neutral" firms score in the low 50 percentile of both social strengths and concerns. We form six long-short portfolios among these four portfolios of stocks and perform asset pricing tests on the returns of these portfolios.

We have three main results. First, we find that the "Grey" portfolio is consistently over-priced relative to the "Neutral" portfolio. If we long the "Neutral" portfolio while shorting the "Grey" portfolio, we obtain an abnormal return of 3.6 percent per year, which is both economically and statistically significant at the 5 percent significance level. The abnormal return is the alpha after controlling for conventional market risk factor, SMB, HML and momentum (MOM) factors (e.g., Fama and French, 1993; Carhart, 1997). On the other hand, we find no evidence for the overpricing of the "Grey" portfolio relative to the "Good" portfolio and only weak overpricing relative to the "Bad" portfolio at the 10 percent significance level. These results suggest that the stock market prices "Grey" portfolio better when social strengths or concerns are considered alone, that is, when "Grey" is benchmarked with either "Good" or "Bad" portfolios. However, the market misprices the "Grey" portfolio relative to "Neutral" portfolio when social strengths and concerns are jointly evaluated. This is because the "Neutral" portfolio has low scores on both social strengths and concerns, and does not match to any component of the CSR performance of the "Grey" portfolio.

Second, we examine which sub-dimension of the CSR performance contributes to the mispricing of the "Grey" portfolio. Specifically, we examine six sub-dimensions of KLD scores, such as community, corporate governance, diversity, employee relations, environment, and product. We find that the overpricing of "Grey" stocks is consistently observed under "community" and "environment" sub-dimensions up to 4.2 percent per year. This result shows

that the market fails to correctly price ambiguous community and environmental practices in "Grey" firms compared to "Neutral" firms.

Lastly, in the robustness tests, we find that the overpricing of "Grey" stocks relative to "Neutral" stocks is observed mainly among less prominent but not necessarily smaller firms. When we conduct the same analysis using S&P500 index firms, we find little evidence of the overpricing. The S&P500 firms are more prominent firms in our sample since they attract more investors and analyst coverage (e.g., Oikonomou, Brooks and Pavelin, 2012). Nevertheless, we do not find any mispricing when we employ equally-weighted portfolio returns. This suggests that our main result is not driven by a size effect. Our result is also robust after we exclude "Sin" stocks (i.e., those stocks in alcohol, gambling and tobacco industries) or those stocks from "Controversial" industries (i.e., alcohol, gambling, tobacco, firearms, military, and nuclear power industries), suggesting the robustness of our finding even for socially responsible investment portfolios which would have screened off such controversial stocks. Therefore, the over-pricing phenomenon of "Grey" stocks is not driven by these "Sin" stocks or "Controversial" industries.

Our study contributes to the literature in two important ways. First, there is no prior study to our knowledge that has studied "Grey" firms from an asset pricing perspective. Mattingly and Berman (2006) are among the first to point out that positive and negative social actions are both empirically and conceptually distinct constructs and should not be combined in future research. Recently, Bouslah, Kryzanowski and M'Zali (2013) take on this approach when they examine the link beween firm's social performance and firm risk (total and idiosyncratic risk). They find that the strength and concern of individual dimension of firm's social performance affects the risk differently. In this paper, we examine the asset pricing aspect of "Grey" firms—firms that score

high on both social strength and social concerns. This mispricing is very persistent and robust, which draws an urging need for price correction for these "Grey" firms.

Second, our study further extends the understanding of the sub-dimensions of CSR (e.g., Galema, Plantinga and Scholtens, 2008; Bouslah, Kryzanowski and M'Zali, 2013). In particular, our finding shows that the market misprices the "community" and "environment" sub-dimensions of CSR. Given many institutional investors have signed the Principles of Responsible Investment (PRI) that aim to integrate environmental, social and governance issues into the investment decisions, the market mispricing of the "community" and "environment" sub-dimensions of CSR shall be closely examined and corrected.

The remainder of the paper is organized as follows. Section 2 develops testable hypotheses. Section 3 describes the data used. Section 4 presents the main results and section 5 concludes.

## 2. Hypothesis Development

The literature has not explicitly examined the relative pricing of "Grey" firms compared to other firms. Some prior studies have examined the positive and negative attributes of companies' CSR independently. For example, Galema, Plantinga and Scholtens (2008) built 12 portfolios based on whether stocks are known to be socially responsible or socially irresponsible in any of the six SRI dimensions of Community, Corporate Governance, Diversity, Employee Relations, Environment and Products. However, as the paper itself has pointed out, portfolios that capture the positive and negative attributes are not mutually exclusive as a company can be socially responsible and socially irresponsible at the same time, even within the same

dimension.[2] As a result, "Grey" firms would be included both in the socially responsible portfolio along with the "Good" (socially responsible) firms, and also in the "Bad" (socially irresponsible) firms.

Other studies try to examine a company as a whole by taking into account both the positive and negative attributes of the social performance of the firm together. These studies usually make use of an aggregate measure obtained from netting off the positive attributes with the negative attributes (Bauer, Derwall, and Hann, 2009; Li, Cheung and Roca, 2010; Goss, 2012; De Long, 2012). However, in this way, the "Grey" firms would usually end up somewhere in the middle of the spectrum and remain undifferentiated from the "Neutral" companies, which adopt neither "socially responsible" nor "socially irresponsible" practices. Bouslah, Kryzanowski and M'Zali (2013) are among the first that examine the impact of social strengths and concerns on the firm risk. However, they have not examined the relative pricing of these "Grey" firms.

In the literature, there are two theories that suggest how market shall price socially responsible or socially irresponsible firms. They include *stakeholder theory* and *investor recognition theory*. Both theories predict that socially responsible firms shall have lower cost of equity and socially irresponsible firms shall have higher cost of equity.

The *stakeholder theory* emphasizes the reduction of risk in socially responsible firms comes from reduced social and environmental risk, future explicit claims from its stakeholders and deadweight cost during distress (e.g. Feldman, Soyka and Ameer, 1997; Sharfman and Fernando, 2008). Empirical support for this theory can be found in Galema, Plantinga and Scholtens (2008), Ghoul, Guedhami, Kwok and Mishra (2011), Oikonomou, Brooks and Pavelin (2012), and Bouslah, Kryzanowski and M'Zali (2013).

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[2] For instance, within the Environmental dimension, companies can be spewing hazardous waste and engaging in recycling and making use of green source of energy at the same time.

On the other hand, the *investor recognition theory* suggests that socially irresponsible firms may experience a reduction in the firm's investor base through negative screening processes arising from an increasing demand for *socially responsible investment*. Such reduction can result in a higher cost of capital and lower market value for the firm (Merton, 1987, p.500). Recently, Heinkel, Kraus and Zechner (2001) develop an equilibrium model that shows this result. Empirical support for this theory is found in Hong and Kacperczyk (2009), Hong and Kostotvetsky (2012), and Dhaliwal, Eheitzman, Li, Tsang and Yang (2009).

Given that the "Grey" firms can be considered as both socially responsible and irresponsible firms at the same time, it is an empirical question how their "strengths" or "concerns" are being priced by the market since no theories predict on the pricing of these two aspects in a single firm. If the market knows how to price social "strengths" correctly, we shall expect that "Grey" firms be fairly priced with respect to "Bad" firms because they share similar social "concerns". On the other hand, if the market knows how to price social "concerns" correctly, we shall expect that "Grey" firms be fairly priced relative to "Good" firms. Furthermore, if the market knows how to price social "strengths" and "concerns" jointly, we should expect that "Grey" firms be correctly priced with respect to "Neutral" firms since they are different in both "strengths" and "concerns". Hence, our first testable hypothesis conjectures on the relative pricing of these "Grey" firms to other firms in terms of the social "strengths" and social "concerns" as follows:

> *Hypothesis 1: "Grey" firms are correctly priced for their social "strengths" and social "concerns" relative to other firms.*

Following the literature, we also examine how the market prices the "Grey" firms along the individual sub-dimension of KLD scores (e.g., Bouslah et al, 2013). Instead of using the

aggregate "strength" and "concern" score, we examine the individual strength and concern in each sub-dimension of the firm's social performance. There are six sub-dimensions of socially responsible measures, such as community score, corporate governance score, diversity score, employee relations score, environment score, and product score. The Community category relates to how the firms interact with its social environment. Corporate Governance is about the composition of the senior management and the board. Diversity score reflects how the firm treats women and minorities. Employee Relation relates to the relation between the company and its employees. Environment is about the company's environmental management and policies. Product is about the quality and production processes of the firms' products and services. We hypothesize the following:

*Hypothesis 2: Each sub-dimension of "Grey" firm's social "strengths" and "concerns" is correctly priced relative to other firms.*

In the following sections, we conduct empirical analysis on these two hypotheses.

## 3. Data and Methodology

### 3.1. Key Variables

To measure a firm's level of social responsibility and social irresponsibility, we use corporate social responsibility rating from KLD (Kinder, Lydenberg, Domini, 1993), which is widely used in the literature (e.g. Galema et al., 2008; Bouslah et al., 2013). KLD started its coverage with the firms in S&P 500 Index and Domini 400 Social Index in 1991 and has since expanded the universe of stocks to Russell 1000, Russell 2000 and Russell 3000 over the years. In our analysis, we use 20 years of KLD data from January 1991 to December 2010 and the CRSP return data from January 1992 to December 2011 to perform the analysis. This is because

KLD measure is only available once a year, and to avoid the look-ahead bias, we use prior year's KLD score for sorting and formation of the testable portfolios and perform regression analysis using returns in the following year.

KLD uses both positive and negative screens on multiple criteria to evaluate a firm's performance in terms of social responsibility. In our study, we use the following six sub-dimensions from KLD[3]: Community, Corporate Governance, Diversity, Employee Relations, Environment and Products. For each of these abovementioned sub-dimensions, KLD evaluates multiple sub-sub-dimensions which can be separated into "Strengths" and "Concerns". "Strengths" refer to positive attributes of firms while "Concerns" refer to negative attributes of firms. KLD indicates the presence of a positive attribute or a negative attribute with a score of 1 and the absence of it with a score of 0 in each of these sub-criteria. In our study, we follow the literature and aggregate the scores of these sub-sub-dimensions to obtain a "strength" score and a "concern" score under each of the six sub-dimensions. These scores will be used to test *Hypothesis 2*. To test *Hypotheses 1*, we further add up the "strength" and "concern" scores of the six sub-dimensions to obtain an overall "Firm Strength Score" and "Firm Concern Score" for each firm. We use the "Firm Strength Score" as a proxy for the firm's level of social responsibility (or positive attributes) and the "Firm Concern Score" as a proxy for the firm's level of social irresponsibility (or negative attributes). The "Firm Net Score" is obtained by subtracting the "Firm Concern Score" from the "Firm Strength Score".

Our main dependent variables are the monthly stock returns obtained from CRSP. The returns are matched to the KLD data based on firm tickers and names. The market risk premium

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[3] Aside from these six categories, KLD also investigates company over their conduct in the category Human Rights. However, this category has only been available from 2002 and thus, it has been excluded from this study. Please see www.kld.com for more detailed information.

(MKT), SMB, HML and momentum (MOM) factors as well as the risk-free rate proxied by 1-month U.S. T-bill rate are obtained from Kenneth French's website. Other data such as Book to Market Ratios and market capitalization are from COMPUSTAT.

### 3.2. Methodology

To assess the relative pricing of "Grey" stocks, we begin by splitting the universe of stocks into four different groups. First, we sort the universe of stocks based on the firm-level KLD Strength Score. We assign stocks whose KLD Strength Scores are in the top 50% percentile of the universe into Category "A" and those whose scores are in the bottom 50% of the universe in Category "B". Second, we repeat the sorting process but this time using the firm-level KLD Concern Score as the sorting variable. We put stocks whose KLD Concern Scores are in the bottom 50% of the universe into Category "1" and those in the top 50% of the universe into Category "2". Stocks which are present in both Category A and Category 1 are then classified as "Good" stocks. Those which are present in both Category A and Category 2 are classified as "Grey" stocks. Those which are present in both Category B and Category 1 are classified as "Neutral" stocks and those which are present in both Category B and Category 2 are classified as "Bad" stocks. In Table 1 we present a graphical representation of this categorization. We repeat this categorization process each year after the yearly KLD data is released from January 1991 to December 2011.

[Insert Table 1 about here]

Based on this classification in year $t$, we form six value-weighted (VW) long-short portfolios in year $t+1$ to avoid look-ahead bias since KLD measures are available on the yearly basis. The six portfolios are long-short portfolios by pairing each of the four groups to one another. They include Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey,

Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. We run time-series regression of these six portfolios using the Fama-French three factors and Carhart's (1997) momentum factor as follows:

$$R_{i,t} - RF_t = \beta_0 + \beta_i(RM_t - RF_t) + s_i\,SMB_t + h_i\,HML_t + m_i\,MOM_t + \varepsilon_{it} \qquad (1)$$

where $R_{i,t}$ is the return on portfolio $i$, constructed as explained above, in month $t$. $RM_t$ is the value-weighted return of all CRSP returns in month $t$, $RF_t$ is the return in month t of a one-month treasury bill, $SMB_t$ is the difference in monthly return between a small and large-cap portfolio at time $t$, $HML_t$ is the difference in return between a value and a growth portfolio at time $t$ and $MOM_t$ is the monthly return on a portfolio long on past one-year winners and short on past one-year losers at time $t$. The literature has shown that the four factor model is applicable for examining the performance of passive benchmark indices formed based on market capitalizations (e.g., Bauer, Koedijk and Otten, 2005). To test *Hypothesis 2*, we repeat the regression for the portfolios which are formed based on each of the six sub-dimensions of prior year KLD scores.

**3.3. Summary Statistics**

In Table 2, we present the summary statistics of our entire sample from January 1992 to December 2011. Panel A reports the summary statistics of the firm characteristics according to the four categories defined in Table 1. Panel B reports the summary statistics of the KLD scores of the four categories of firms.

[Insert Table 2 about here]

Panel A in Table 2 shows that "Neutral" firms have the highest average monthly return at 1.03 percent, which is higher than "Grey", "Good" and "Bad" firms (which are at 0.94, 0.88, and

0.88 percent respectively). This is interesting because Hong and Kacperczyk (2009) argue that socially irresponsible firms need to offer higher returns to attract more investors. Moreover, "Grey" firms have the largest market capitalization on average at US$16.2 billion. Therefore, "Grey" firms are not likely to be small firms. "Grey" firms also contain most of the "sin" stocks and those stocks in "Controversial" industries (at 2.55 percent and 12.73 percent respectively). "Sin" stocks are defined as firms that are involved in tobacco production, alcohol production or gaming business. This definition was taken from Hong and Kacperczyk (2009). Meanwhile, "controversial" stocks are taken from KLD's database definition and include firms who are engaged in alcohol, gambling, tobacco, firearms, military or nuclear power business.

Panel B in Table 2 shows that the "Grey" firms have the highest KLD social strength score and social concern score at 3.17 and 3.36 respectively. Interestingly, their average social strength score is even higher than that of the "Good" firms which is at 2.08, and their average social concern score is also higher than that of the "Bad" firms which is at 2.51. This shows that "Grey" firms do better than "Good" firms in social strength but they also score worse than "Bad" firms in social concern. These are interesting features of "Grey" firms that have not been documented before.

Figure 1 shows the time series pattern of the net KLD scores of these four categories of firms. The net score is the social strength score minus the social concern score. We can see clearly that "Good' firms dominate "Grey" firms, "Grey" firms dominates "Neutral" and "Bad" firms, and "Neutral" firms dominates "Bad" firms in the net KLD score. We also observe the net scores can vary from year to year. In Panel B, Table 2, "Good" firms have an average net score of 1.55. "Grey" firms have an average net score of -0.19. "Neutral" firms have an average net score of -0.38 and "Bad" firms have an average net score of -2.41.

Interestingly, when we plot the time series of the monthly returns on the four portfolios from January 1992 to December 2011 in Figure 2, we do not find significant difference across these four portfolios. Therefore, we employ a rigorous asset pricing model to evaluate the relative pricing of these "Grey" firms.

[Insert Figure 1 & 2 about here]

Table 3 shows the summary statistics of the S&P500 index constituents. We re-perform the double sorting in Table 1 by using the KLD measures from the prior year for S&P500 index constituents. We use the subsample of S&P500 firms for robustness tests.

[Insert Table 3 about here]

Panel A in Table 3 shows that S&P500 firms are larger in size than the overall sample used in Table 2. The largest firms are again the "Grey" firms. "Grey" firms also comprise significant representations of "Sin" stocks and stocks in "Controversial" industries (3.70% and 25.50% respectively), second only to "Bad" firms. Panel B in Table 3 also shows that S&P 500 firms have much higher KLD scores on both social strength and social concern across all four categories of firms compared to our overall sample. "Good" firms have higher net KLD score than before whereas "Bad" firms also have more negative net KLD score than before. "Grey" firms have a slightly higher net KLD score compared to before. As S&P500 firms are more visible and are followed by more analysts (e.g., Oikonomou, Brooks and Pavelin, 2012), it is not surprising that KLD has more information on the social performance of these visible firms.

Overall, we find that the "Grey" firms are larger and score higher along both the social strength and social concern dimensions according to KLD compared to other firms. In the next section, we examine how the market prices these firms relative to other firms.

# 4. Empirical Findings

## 4.1. Are "Grey" Firms Correctly Priced for their "Social Strengths" and "Concerns"?

To test *Hypothesis 1*, we employ the Carhart (1997) four-factor model on the ten portfolios. First four portfolios consist of "Good", "Bad", "Grey" and "Neutral" firms respectively. Six long-short portfolios are Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. We run the time-series return regression on the excess returns of these six portfolios against four risk factors. The standard deviations are Newey-West (1987) standard errors with the lag of three months. The results are presented in Table 4.

[Insert Table 4 about here]

First, we find that the "Long Bad Short Grey" portfolio has a positive alpha of 0.27%, significant at the 10% significance level. This indicates that the market overprices the "social strengths" in the "Grey" portfolio by 3.2% per year. Given that the alpha of the "Long Good Short Grey" portfolio is indifferent from zero, we find little mispricing of "social concerns" in the "Grey" portfolio. The alpha of "Long Neutral Short Grey" portfolio is the highest at 0.30%, significant at the 5% significance level. The abnormal return amounts to about 3.6% per year. This result is also consistent with our earlier conjecture that the market overprices "social strengths". Hence, our results suggest that *Hypothesis 1* is rejected.

It is also interesting to note that the "Long Good and short Neutral" has an alpha of –0.25%, significant at 10% significance level. This also suggests that the market rewards "social strengths" of "Good" firms relative to "Neutral" firms after controlling for known systematic risk. This

finding is consistent with our identification of overpricing of "social strengths" in socially ambiguous "Grey" firms relative to other firms.

Overall, we find empirical evidence rejecting *Hypothesis 1*. For the first time in the literature, we identify the overpricing of "Grey" stocks relative to other stocks, possibly due to the overpricing of their "social strengths" in the midst of "social concerns".

**4.2. What Aspect of Social Performance Do Investor Care?**

In this section, we test *Hypothesis 2*. Specifically, we re-sort all the firms according to the KLD strength score and KLD concern score along each of the six sub-dimensions of KLD scores. The six sub-dimensions include community, corporate governance, diversity score, employee relations score, environment score, and product score. Table 5 presents the results.

[Insert Table 5 about here]

Table 5 Panel A and Panel E show that the overpricing of "Grey" stocks is consistently observed along the "community" and "environment" sub-dimensions of firm's CSR performance. The alphas are at 0.31 to 0.35 percent per month respectively. The maximum overpricing of the "Grey" portfolio amounts to an annual return of 4.2 percent relative to "Neutral" portfolios.[4] Moreover, we continue to find that along these two sub-dimensions, the coefficients of the market risk factor and the size risk factor is statistically significantly positive for the "Long

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[4] Although we also find the over-pricing is observed along the "diversity" sub-dimension in Panel C, Table 5, we will ignore this result due to a highly asymmetric nature of the diversity strength and concern measures. The diversity strength scores contain ten aspects of the firm's diversity practices, such as whether the firm's CEO is a woman or a member of a minority group; whether the firm has made notable progress in the promotion of women and minorities; whether women, minorities, and/or the disabled hold enough seats on the board of directors; whether the firm has developed any programs to address work/family concerns; whether firms contract with women- and/or minority-owned businesses; whether firm employs disabled; whether the firm has provided benefits to the domestic partners of its employees. The diversity concern scores only contain two aspects of the diversity practices, such as whether firm has paid substantial fines or civil penalties as a result of affirmative action controversies, or involved in major controversies related to affirmative actions. The over-pricing of the "Grey" firms compared to "Bad" and "Neutral" portfolios along the "diversity" sub-dimension can be easily driven by a better measure of the "diversity strength" than that of the "diversity concern".

Neutral Short Grey" portfolio as before, suggesting relative lower systematic risk in "Grey" firms than the "Neutral" firms. This is also consistent with Bouslah et al (2013).

The rejection of *Hypothesis 2* has important policy implications. It suggests that the financial market may not accurately price the "community" and "environment" social performance. Although the market can do so when these "strengths" and "concerns" are considered alone in the case of comparing to "Bad" and "Good" portfolios, it does a poor job when "strengths" and "concerns" are considered together when compared to "Neutral" portfolio. Given the growing interests by institutional investors that have signed the Principles of Responsible Investment (PRI) to integrate the environmental, social and governance concerns in their investment decisions,[5] such significant mis-pricing may be corrected in good time.

**4.3. Robustness Tests**

In this section, we perform several robustness tests. First, we conduct the same return regression for a subsample of firms in our data that have better investor followings. Second, we exclude those firms against which socially responsible investors would apply negative screening and validate if the mispricing persists. Third, to differentiate the story of size effect and visibility to investors, we repeat all tests with equally-weighted returns. If size (rather than visibility or investor scrutiny) is the driving factor for the mis-pricing, we shall observe stronger mispricing with equal-weighted returns.

Consistent with the *investor recognition theory*, we find that the mis-pricing disappears in the subsample of S&P 500 index constituents. Table 6 reports the results.

[Insert Table 6 about here]

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[5] http://www.unpri.org/.

Table 6 shows that the three long-short portfolios that involved "Grey" stocks are not over-priced by the market relative to other firms. This result indicates that the market does a reasonably good job in pricing the social strengths and concerns among most visible firms. This is comforting to know because we expect that the market can still price the "Grey" stocks accurately. Like before, we continue to find that "Grey" firms have lower systematic risk than "Neutral" firms, consistent with Oikonomou et al. (2012).

In the second test, we delete the "sin" stocks and the stocks in "controversial" industries. The sin stocks refer to the stocks from alcohol, gambling and tobacco industries whereas controversial industries further include firearms, military and nuclear power industries. Results are reported in Table 7.

[Insert Table 7 about here]

In the two sub-samples, we still observe persistent over-pricing of "Grey" firms relative to "Neutral" firms. Indeed, Panel A in Table 7 shows that the over-pricing of "Grey" stocks amounts to 3.7 percent per year at the 5 percent significance level after deleting the "sin" stocks. Panel B in Table 7 shows that a similar result after deleting the stocks in the controversial industries. The over-pricing amounts to 3.8 percent annually for "Grey" portfolio relative to "Neutral" portfolio at the 1 percent significance level. These results are consistent with our main results, suggesting the robustness of our findings for even socially responsible investors who would have screened out these controversial stocks. This result provides more support for *stakeholder theory* since *investor recognition theory* would suggest that the over-pricing becomes weaker once controversial stocks are removed due to negative screening by socially responsible investors.

The third robustness test serves to confirm that the disappearing of the over-pricing of "Grey" stocks in S&P500 firms documented earlier in Table 6 is not simply driven by the size effect. We do so by replacing market capitalization weighted stock returns with equally-weighted returns. We report the regression results in Table 8.

[Insert Table 8 about here]

Table 8 shows that across all samples, the overall sample, the S&P500 subsample, and those which exclude "sin" stocks or stocks in "controversial" industries, the over-pricing of "Grey" stocks is not observed anywhere. The result suggests that the documented over-pricing is not driven by the small firm effect. If it were, the mispricing would have been even more pronounced in this analysis using equally-weighted returns. Therefore, we conclude that our main result is stronger among less visible firms but not necessarily smaller firms.

Table 9 further conducts the return analysis for the S&P 500 firms by examining the six sub-dimensions of the KLD scores.

[Insert Table 9 about here]

Interestingly, we find that the 'Grey" firms are also over-priced under "community" sub-dimension relative to "Neutral" firms for S&P 500 firms at the 10 percent significance level. This result is significant because these are very prominent firms, yet they are also subject to the mispricing of "community" social performance. The mispricing amounts to 4.2 percent per year relative to "Neutral" firms. This is the first time, in the literature, that the over-pricing of "community" social performance is documented for "Grey" firms.

# 5. Conclusion

In this paper, we set out to investigate a category of firms that have so far been neglected in the literature: those of firms that are socially responsible in some dimensions but are socially irresponsible in the same or other dimensions. We name them "Grey" firms.

Our study finds a significant positive abnormal return of 3.6 percent when we short "Grey" stocks while we long "Neutral" stocks. We also find that the "community" and "environment" sub-dimensions of firm's social performance (proxied by KLD scores) are the main drivers for the overpricing. Our findings are robust and persist in both the constrained investment universe of socially responsible investors as well as the unconstrained investment universe. We show that this mispricing of "Grey" stocks is not driven by small firms, the "Sin" stocks or "Controversial" industries.

To our knowledge, our paper is among the first in the literature that specifically examines the "Grey" stocks from an asset pricing perspective. Our findings suggest that the market treats these firms differently from other categories of stocks. Investors tend to mis-value their socially ambiguous actions. The implication for investors is that such overpricing may be permanent if there is no intervention to encourage responsible community and environmental practices.

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**TABLE 1. CLASSIFICATION OF STOCKS**

This table presents a graphical representation of how we classify the universe of stocks into four different categories. We first separated the stocks into the top 50% and bottom 50% of the sample stocks based on their KLD Strength Score. The top 50% of the stocks are placed in Category A and those in the bottom 50% in Category B. We then did a conditional sort on the sample again but by using KLD Concern Score. The bottom 50% of the sample stocks terms of KLD Concern Score are then placed in Category 1 and those in the top 50% are placed in Category 2. "Good" stocks are those which are present in both Category A and Category 1. "Neutral" stocks are those which are present in both Category B and Category 1. "Grey" stocks are those which are present in both Category A and Category 2. "Bad" stocks are those which are present in both Category B and Category 2.

|  |  | KLD Concern Score | |
|---|---|---|---|
|  |  | Bottom 50%<br>Category 1 | Top 50%<br>Category 2 |
| KLD Strength Score | Top 50%<br>Category A | "Good" stocks | "Grey" stocks |
|  | Bottom 50%<br>Category B | "Neutral" stocks | "Bad" stocks |

**TABLE 2. SUMMARY STATISTICS**

This table presents the summary statistics for the four different categories of firms used in our study: Good, Bad, Grey and Neutral. The four categories are defined in Table 1. Panel A presents the average monthly returns from CRSP from January 1992 to December 2011, average standard deviations of monthly returns as well as average market capitalizations for stocks in each of the categories, the percentage of "Sin" stocks in each of the category (stocks of publicly traded companies who engage in alcohol production, tobacco production or gambling) and the percentage of stocks in each of the category that belong to "Controversial" industries: Alcohol, Gambling, Tobacco, Firearms, Military and Nuclear Power. Panel B presents the summary statistics of KLD data in each of the different categories.

| Category | Good | Bad | Grey | Neutral |
|---|---|---|---|---|
| **Panel A** | | | | |
| Mean monthly returns | 0.88% | 0.88% | 0.94% | 1.03% |
| Standard Deviations of returns | 13.51% | 14.17% | 13.03% | 14.80% |
| Average market capitalization (USD billion): | 3.42 | 3.09 | 16.20 | 2.09 |
| Number of Observations | 76,740 | 72,908 | 84,914 | 71,163 |
| Percentage of Sin Stocks | 1.20% | 2.49% | 2.55% | 1.45% |
| Percentage of Stocks in Controversial Industries | 4.14% | 9.66% | 12.73% | 5.06% |
| **Panel B** | | | | |
| Net KLD Score: | | | | |
| o Average | 1.55 | -2.41 | -0.19 | -0.38 |
| o Standard Deviation | 1.65 | 1.20 | 2.74 | 0.64 |
| o Median | 1 | -2 | -1 | 0 |
| o Maximum | 15 | 0 | 15 | 2 |
| o Maximum attainable | 39 | 39 | 39 | 39 |
| o Minimum | 0 | -10 | -9 | -1 |
| o Minimum attainable | -30 | -30 | -30 | -30 |
| KLD Strength Score: | | | | |
| o Average | 2.08 | 0.10 | 3.17 | 0.13 |
| o Standard Deviation | 1.57 | 0.33 | 2.83 | 0.39 |
| o Median | 2 | 0 | 2 | 0 |
| o Maximum | 16 | 2 | 22 | 2 |
| o Maximum attainable | 39 | 39 | 39 | 39 |
| o Minimum | 1 | 0 | 1 | 0 |
| o Minimum attainable | 0 | 0 | 0 | 0 |
| KLD Concern Score: | | | | |
| o Average | 0.53 | 2.51 | 3.36 | 0.51 |
| o Standard Deviation | 0.50 | 1.18 | 2.15 | 0.50 |
| o Median | 1 | 2 | 3 | 1 |
| o Maximum | 1 | 10 | 16 | 1 |
| o Maximum attainable | 30 | 30 | 30 | 30 |
| o Minimum | 0 | 1 | 1 | 0 |
| o Minimum attainable | 0 | 0 | 0 | 0 |

**TABLE 3. SUMMARY STATISTICS OF S&P 500 SAMPLE**

This table presents the summary statistics for the four different categories of firms used in our study: Good, Bad, Grey and Neutral. The four categories are defined in Table 1. The sample returns are S&P 500 returns from January 1992 to December 2011. Panel A presents the average monthly returns from CRSP, standard deviations of monthly returns, average market capitalizations for stocks in each of the categories, the percentage of "Sin" stocks in each of the category (stocks of publicly traded companies who engage in alcohol production, tobacco production or gambling) and the percentage of stocks in each of the category that belong to "Controversial" industries: Alcohol, Gambling, Tobacco, Firearms, Military and Nuclear Power. Panel B presents the summary statistics of KLD data in each of the different categories.

| Category | Good | Bad | Grey | Neutral |
|---|---|---|---|---|
| **Panel A** | | | | |
| Mean monthly returns | 1.01% | 0.91% | 0.91% | 0.93% |
| Standard Deviations of returns | 10.48% | 11.29% | 9.97% | 10.77% |
| Average market capitalization (USD billion): | 16.10 | 11.80 | 41.60 | 8.61 |
| Number of Observations | 18,840 | 17,531 | 23,315 | 24,200 |
| Percentage of Sin Stocks | 2.34% | 3.84% | 3.70% | 2.43% |
| Percentage of Stocks in Controversial Industries | 10.28% | 26.25% | 25.50% | 10.37% |
| **Panel B** | | | | |
| Net KLD Score: | | | | |
| o Average | 3.33 | -3.13 | 0.67 | -0.24 |
| o Standard Deviation | 2.28 | 1.85 | 3.30 | 1.07 |
| o Median | 3 | -3 | 0 | 0 |
| o Maximum | 15 | 0 | 15 | 4 |
| o Maximum attainable | 39 | 39 | 39 | 39 |
| o Minimum | 0 | -10 | -9 | -3 |
| o Minimum attainable | -30 | -30 | -30 | -30 |
| KLD Strength Score: | | | | |
| o Average | 4.48 | 0.92 | 5.71 | 0.90 |
| o Standard Deviation | 2.44 | 0.88 | 3.32 | 0.88 |
| o Median | 4 | 1 | 5 | 1 |
| o Maximum | 17 | 4 | 22 | 4 |
| o Maximum attainable | 39 | 39 | 39 | 39 |
| o Minimum | 1 | 0 | 1 | 0 |
| o Minimum attainable | 0 | 0 | 0 | 0 |
| KLD Concern Score: | | | | |
| o Average | 1.16 | 4.05 | 5.04 | 1.14 |
| o Standard Deviation | 0.93 | 1.86 | 2.65 | 0.89 |
| o Median | 1 | 4 | 4 | 1 |
| o Maximum | 3 | 11 | 16 | 3 |
| o Maximum attainable | 30 | 30 | 30 | 30 |
| o Minimum | 0 | 1 | 1 | 0 |
| o Minimum attainable | 0 | 0 | 0 | 0 |

**TABLE 4. ABNORMAL RETURNS OF THE SIX LONG-SHORT PORTFOLIOS**

The table reports the regression results of the portfolio returns on the four factor models that include MKT, SMB, and HML and Carhart (1997) MOM factors. The dependent variables are the excess stock returns (which subtract one-month Treasury bill rate) from January 1992 to December 2011. MKT is the excess value-weighted return of the whole stock universe with respect to one-month Treasury bill rate in the United State, SMB is the factor-mimicking portfolios for size, HML is the factor-mimicking portfolio for book-to-market ratio and MOM is a factor mimicking portfolio for the return momentum. Reported are the OLS estimates for six value-weighted long-short portfolios include Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. All alphas in the table are monthly figures. T-statistics reported are Newey-West (1987) standard errors with three lags. ***, **, and * represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Long Good Short Bad | -0.0022 | (-1.27) | -0.0129 | (-0.27) | -0.0006 | (-0.01) | -0.1327** | (-2.33) | 0.0137 | (0.29) | 240 | 0.04 |
| Long Good Short Neutral | -0.0025* | (-1.88) | -0.0723** | (-2.00) | -0.0643 | (-0.80) | -0.1121** | (-2.49) | 0.1003** | (2.32) | 240 | 0.13 |
| *Long Good Short Grey* | 0.0005 | (0.33) | 0.0566 | (1.53) | 0.2089*** | (3.48) | -0.0027 | (-0.05) | 0.0550 | (1.06) | 240 | 0.16 |
| *Long Bad Short Grey* | 0.0027* | (1.77) | 0.0695* | (1.70) | 0.2095*** | (5.16) | 0.1300** | (2.30) | 0.0413 | (1.10) | 240 | 0.16 |
| *Long Neutral Short Grey* | 0.0030** | (2.49) | 0.1290*** | (3.30) | 0.2732*** | (4.19) | 0.1094* | (1.84) | -0.0453 | (-1.48) | 240 | 0.27 |
| Long Neutral Short Bad | 0.0003 | (0.23) | 0.0594 | (1.57) | 0.0637 | (0.95) | -0.0206 | (-0.37) | -0.0866*** | (-2.84) | 240 | 0.10 |

## TABLE 5. ABNORMAL RETURNS ALONG INDIVIDUAL DIMENSIONS

The table reports the regression results of the portfolio returns on the four factor models that include MKT, SMB, and HML and Carhart (1997) MOM factors. The dependent variables are the excess stock returns (which subtract one-month Treasury bill rate) of all firms from January 1992 to December 2011. MKT is the excess value-weighted return of the whole stock universe with respect to one-month Treasury bill rate in the United State, SMB is the factor-mimicking portfolios for size, HML is the factor-mimicking portfolio for book-to-market ratio and MOM is a factor mimicking portfolio for the return momentum. Reported are the OLS estimates for six value-weighted long-short portfolios, such as Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. Different panels report the results based on the Strength and Concern KLD Score for the sub-dimension Community Involvement Score (Panel A), Corporate Governance Score (Panel B), Diversity Score (Panel C), Employee Relations Score (Panel D), Environment Score (Panel E), and Product Score (Panel F). All alphas in the table are monthly figures. T-statistics reported are Newey-West (1987) standard errors with three lags. ***, **, and * represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Community** | | | | | | | | | | | | |
| Long Good Short Bad | 0.0002 | (0.09) | -0.0518 | (-0.93) | -0.0951 | (-1.05) | -0.3002*** | (-3.54) | -0.0461 | (-0.94) | 240 | 0.07 |
| Long Good Short Neutral | -0.0025* | (-1.94) | -0.1879*** | (-4.09) | -0.2362*** | (-4.50) | 0.1692*** | (3.40) | -0.0693 | (-1.48) | 240 | 0.40 |
| *Long Good Short Grey* | 0.0006 | (0.31) | -0.0907 | (-1.31) | 0.1555** | (2.45) | 0.0334 | (0.40) | -0.0900 | (-1.48) | 240 | 0.04 |
| *Long Bad Short Grey* | 0.0004 | (0.17) | -0.0389 | (-0.51) | 0.2506*** | (2.79) | 0.3337*** | (2.94) | -0.0440 | (-0.68) | 240 | 0.08 |
| *Long Neutral Short Grey* | 0.0031* | (1.77) | 0.0972* | (1.80) | 0.3918*** | (7.26) | -0.1358* | (-1.94) | -0.0207 | (-0.46) | 240 | 0.23 |
| Long Neutral Short Bad | 0.0027 | (1.43) | 0.1361*** | (2.62) | 0.1412 | (1.58) | -0.4695*** | (-5.49) | 0.0232 | (0.40) | 240 | 0.29 |

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. R$^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Panel B: Corporate Governance** | | | | | | | | | | | | |
| Long Good Short Bad | -0.0032 | (-1.63) | -0.1397*** | (-3.32) | 0.1032 | (1.20) | 0.1710* | (1.83) | -0.0627 | (-1.10) | 240 | 0.08 |
| Long Good Short Neutral | -0.0024 | (-1.39) | -0.1042** | (-2.49) | 0.0276 | (0.47) | -0.1374** | (-2.52) | -0.0456 | (-0.91) | 240 | 0.05 |
| *Long Good Short Grey* | -0.0007 | (-0.24) | -0.0291 | (-0.37) | 0.0818 | (0.79) | 0.2524* | (1.78) | 0.1514** | (1.99) | 228 | 0.07 |
| *Long Bad Short Grey* | 0.0015 | (0.67) | 0.1080* | (1.72) | -0.0477 | (-0.56) | 0.0440 | (0.49) | 0.2127** | (2.47) | 228 | 0.10 |
| *Long Neutral Short Grey* | 0.0015 | (0.56) | 0.0795 | (0.99) | 0.0498 | (0.55) | 0.3916*** | (3.06) | 0.1974** | (1.97) | 228 | 0.14 |
| Long Neutral Short Bad | -0.0008 | (-0.74) | -0.0355 | (-1.15) | 0.0756 | (1.50) | 0.3084*** | (4.62) | -0.0171 | (-0.44) | 240 | 0.23 |
| **Panel C: Diversity** | | | | | | | | | | | | |
| Long Good Short Bad | -0.0025 | (-1.52) | -0.1028** | (-2.52) | -0.3324*** | (-5.39) | -0.2261*** | (-4.24) | 0.0480 | (1.06) | 240 | 0.22 |
| Long Good Short Neutral | -0.0013 | (-1.07) | -0.0699* | (-1.94) | -0.1656** | (-2.18) | -0.2304*** | (-4.13) | 0.0336 | (0.99) | 240 | 0.19 |
| *Long Good Short Grey* | 0.0029 | (1.45) | -0.0472 | (-0.85) | -0.1500*** | (-2.75) | -0.1660** | (-2.11) | -0.0228 | (-0.45) | 240 | 0.05 |
| *Long Bad Short Grey* | 0.0054** | (2.26) | 0.0556 | (0.82) | 0.1824*** | (3.06) | 0.0601 | (0.69) | -0.0708 | (-1.36) | 240 | 0.06 |
| *Long Neutral Short Grey* | 0.0042* | (1.91) | 0.0227 | (0.42) | 0.0156 | (0.18) | 0.0644 | (0.81) | -0.0563 | (-1.23) | 240 | 0.02 |
| Long Neutral Short Bad | -0.0012 | (-0.93) | -0.0329 | (-0.90) | -0.1668*** | (-2.61) | 0.0043 | (0.09) | 0.0144 | (0.43) | 240 | 0.08 |
| **Panel D: Employee Relations** | | | | | | | | | | | | |
| Long Good Short Bad | 0.0006 | (0.50) | 0.0442 | (1.23) | -0.0916** | (-2.29) | -0.3574*** | (-5.88) | 0.0842** | (2.18) | 240 | 0.30 |
| Long Good Short Neutral | -0.0003 | (-0.29) | 0.0083 | (0.26) | -0.1739*** | (-5.07) | -0.2621*** | (-5.74) | 0.0074 | (0.26) | 240 | 0.21 |
| *Long Good Short Grey* | -0.0001 | (-0.03) | 0.1269*** | (3.16) | -0.1937** | (-2.47) | -0.2950*** | (-3.32) | 0.0464 | (1.05) | 240 | 0.14 |
| *Long Bad Short Grey* | -0.0007 | (-0.38) | 0.0826* | (1.76) | -0.1021 | (-1.33) | 0.0624 | (0.70) | -0.0378 | (-1.09) | 240 | 0.04 |
| *Long Neutral Short Grey* | 0.0003 | (0.12) | 0.1185*** | (3.23) | -0.0198 | (-0.23) | -0.0329 | (-0.35) | 0.0389 | (0.83) | 240 | 0.03 |
| Long Neutral Short Bad | 0.0010 | (0.88) | 0.0359 | (0.98) | 0.0823** | (2.04) | -0.0953* | (-1.73) | 0.0768 | (1.61) | 240 | 0.13 |

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. R² |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Panel E: Environment** | | | | | | | | | | | | |
| Long Good Short Bad | -0.0002 | (-0.12) | 0.0569 | (0.88) | 0.0918 | (1.33) | -0.2171*** | (-2.71) | -0.1668*** | (-4.55) | 240 | 0.14 |
| Long Good Short Neutral | -0.0025* | (-1.86) | -0.0301 | (-0.73) | -0.1089*** | (-2.68) | -0.0112 | (-0.23) | -0.0498 | (-1.50) | 240 | 0.05 |
| *Long Good Short Grey* | 0.0010 | (0.49) | 0.1612*** | (3.62) | 0.0877 | (1.33) | -0.1316** | (-2.19) | -0.0211 | (-0.46) | 240 | 0.13 |
| *Long Bad Short Grey* | 0.0013 | (0.79) | 0.1043* | (1.87) | -0.0041 | (-0.08) | 0.0855 | (1.21) | 0.1457*** | (3.34) | 240 | 0.09 |
| *Long Neutral Short Grey* | 0.0035** | (2.12) | 0.1913*** | (5.09) | 0.1966*** | (3.12) | -0.1203** | (-2.01) | 0.0287 | (0.51) | 240 | 0.26 |
| Long Neutral Short Bad | 0.0022 | (1.44) | 0.0870 | (1.58) | 0.2007*** | (3.17) | -0.2058*** | (-3.09) | -0.1170*** | (-2.93) | 240 | 0.24 |
| **Panel F: Product** | | | | | | | | | | | | |
| Long Good Short Bad | 0.0017 | (0.86) | 0.1455*** | (2.88) | 0.3280*** | (4.84) | -0.3634*** | (-5.93) | -0.1277*** | (-2.98) | 240 | 0.40 |
| Long Good Short Neutral | -0.0009 | (-0.57) | -0.0278 | (-0.57) | 0.0058 | (0.10) | -0.1744*** | (-2.66) | -0.1172*** | (-2.90) | 240 | 0.09 |
| *Long Good Short Grey* | 0.0008 | (0.41) | 0.0230 | (0.43) | 0.2793*** | (3.32) | -0.0570 | (-0.71) | -0.0201 | (-0.35) | 240 | 0.09 |
| *Long Bad Short Grey* | -0.0008 | (-0.37) | -0.1226** | (-2.32) | -0.0486 | (-0.85) | 0.3064*** | (3.41) | 0.1076* | (1.71) | 240 | 0.20 |
| *Long Neutral Short Grey* | 0.0017 | (0.91) | 0.0508 | (1.21) | 0.2736*** | (3.84) | 0.1174 | (1.51) | 0.0971** | (2.00) | 240 | 0.12 |
| Long Neutral Short Bad | 0.0026** | (2.09) | 0.1734*** | (5.18) | 0.3222*** | (7.99) | -0.1890*** | (-3.39) | -0.0105 | (-0.26) | 240 | 0.49 |

**TABLE 6. ABNORMAL RETURNS OF THE SIX PORTFOLIOS, S&P 500 SAMPLE**

The table reports the regression results of the portfolio returns on the four factor models that include MKT, SMB, and HML and Carhart (1997) MOM factors. The dependent variables are the excess stock returns (which subtract one-month Treasury bill rate) of S&P 500 firms from January 1992 to December 2011. MKT is the excess value-weighted return of the whole stock universe with respect to one-month Treasury bill rate in the United State, SMB is the factor-mimicking portfolios for size, HML is the factor-mimicking portfolio for book-to-market ratio and MOM is a factor mimicking portfolio for the return momentum. Reported are the OLS estimates for six value-weighted long-short portfolios, such as Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. All alphas in the table are monthly figures. T-statistics reported are Newey-West (1987) standard errors with three lags. \*\*\*, \*\*, and \* represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Long Good Short Bad | -0.0002 | (-0.09) | 0.0196 | (0.46) | 0.0111 | (0.18) | -0.2224\*\*\* | (-4.01) | 0.0024 | (0.05) | 240 | 0.08 |
| Long Good Short Neutral | -0.0008 | (-0.59) | -0.0469 | (-1.46) | 0.0094 | (0.13) | -0.1126\*\* | (-2.14) | 0.0815 | (1.61) | 240 | 0.09 |
| *Long Good Short Grey* | 0.0006 | (0.39) | 0.0943\*\* | (2.25) | 0.1894\*\*\* | (3.10) | -0.0931 | (-1.63) | 0.0536 | (0.90) | 240 | 0.18 |
| *Long Bad Short Grey* | 0.0008 | (0.47) | 0.0748 | (1.58) | 0.1783\*\*\* | (3.50) | 0.1293\* | (1.87) | 0.0512 | (1.11) | 240 | 0.11 |
| *Long Neutral Short Grey* | 0.0015 | (1.09) | 0.1412\*\*\* | (3.50) | 0.1800\*\*\* | (3.27) | 0.0196 | (0.32) | -0.0279 | (-0.88) | 240 | 0.20 |
| Long Neutral Short Bad | 0.0007 | (0.40) | 0.0665 | (1.51) | 0.0017 | (0.02) | -0.1098 | (-1.60) | -0.0791\*\* | (-2.25) | 240 | 0.08 |

## TABLE 7. EXCLUDE SIN STOCK AND CONTROVERSIAL INDUSTRIES

The table reports the results of Carhart (1997) four factor model for the sample without "Sin" stocks and the stocks in "Controversial" industries from January 1992 to December 2011. The dependent variables are the excess stock returns (which subtract one-month Treasury bill rate). Panel A excludes "Sin" stocks and Panel B excludes those stocks from "Controversial" industries. "Sin" stocks refer to those stocks that engage in alcohol production, tobacco production or gambling. "Controversial" industries refer to the above three industries and Firearms, Military and Nuclear Power industries. MKT is the excess value-weighted return of the whole stock universe with respect to one-month Treasury bill rate in the United State, SMB is the factor-mimicking portfolios for size, HML is the factor-mimicking portfolio for book-to-market ratio and MOM is a factor mimicking portfolio for the return momentum. Reported are the OLS estimates for six value-weighted long-short portfolios, such as Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. All alphas in the table are monthly figures. T-statistics reported are Newey-West (1987) standard errors with three lags. ***, **, and * represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Alpha | t-stat | MKTRF | t-stat | SMB | t-stat | HML | t-stat | MOM | t-stat | N | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Sin Stocks Excluded** | | | | | | | | | | | | |
| Long Good Short Bad | -0.0021 | (-1.19) | -0.0017 | (-0.03) | -0.0011 | (-0.02) | -0.1461** | (-2.32) | 0.0289 | (0.58) | 240 | 0.05 |
| Long Good Short Neutral | -0.0026* | (-1.92) | -0.0586 | (-1.62) | -0.0614 | (-0.73) | -0.1255*** | (-2.62) | 0.1133** | (2.47) | 240 | 0.13 |
| *Long Good Short Grey* | 0.0003 | (0.24) | 0.0563 | (1.53) | 0.2110*** | (3.27) | -0.0155 | (-0.30) | 0.0721 | (1.34) | 240 | 0.18 |
| *Long Bad Short Grey* | 0.0025 | (1.61) | 0.0581 | (1.39) | 0.2121*** | (5.00) | 0.1307** | (2.21) | 0.0431 | (1.17) | 240 | 0.16 |
| *Long Neutral Short Grey* | 0.0030** | (2.50) | 0.1149*** | (3.07) | 0.2724*** | (4.21) | 0.1101* | (1.86) | -0.0412 | (-1.41) | 240 | 0.26 |
| Long Neutral Short Bad | 0.0005 | (0.35) | 0.0568 | (1.40) | 0.0603 | (0.91) | -0.0206 | (-0.35) | -0.0843*** | (-2.77) | 240 | 0.09 |
| **Panel B: Controversial Industries Excluded** | | | | | | | | | | | | |
| Long Good Short Bad | -0.0023 | (-1.11) | 0.0261 | (0.47) | 0.0618 | (0.83) | -0.1490** | (-2.07) | 0.1033 | (1.60) | 240 | 0.10 |
| Long Good Short Neutral | -0.0039** | (-2.44) | -0.0685* | (-1.85) | -0.0468 | (-0.57) | -0.0879* | (-1.82) | 0.1112** | (2.19) | 240 | 0.11 |
| *Long Good Short Grey* | -0.0006 | (-0.41) | 0.0504 | (1.34) | 0.2764*** | (3.56) | 0.0183 | (0.34) | 0.0583 | (1.09) | 240 | 0.21 |
| *Long Bad Short Grey* | 0.0016 | (1.04) | 0.0243 | (0.54) | 0.2146*** | (4.42) | 0.1672*** | (2.77) | -0.0450 | (-1.42) | 240 | 0.15 |
| *Long Neutral Short Grey* | 0.0032*** | (2.87) | 0.1190*** | (3.27) | 0.3232*** | (5.82) | 0.1062** | (2.07) | -0.0529* | (-1.86) | 240 | 0.32 |
| Long Neutral Short Bad | 0.0016 | (1.11) | 0.0946* | (1.91) | 0.1086* | (1.79) | -0.0611 | (-1.08) | -0.0079 | (-0.22) | 240 | 0.10 |

## TABLE 8. EQUALLY-WEIGHTED RETURNS

The table reports the results of Carhart (1997) four factor model from January 1992 to December 2011. The dependent variables are the equally-weighted stock returns for the overall sample, S&P500 sample, sample with "Sin" stocks excluded, and sample with "Controversial" industries excluded respectively. The returns are the stock returns in excess of the risk-free rate in the year following the reporting of the annual KLD measures. "Sin" stocks refer to those stocks of publicly traded companies that engage in alcohol production, tobacco production or gambling. "Controversial" industries refer to Alcohol, Gambling, Tobacco, Firearms, Military and Nuclear Power industries. Reported are the OLS estimates for six equally-weighted long-short portfolios, such as Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. T-statistics reported are Newey-West (1987) standard errors with three lags. \*\*\*, \*\*, and \* represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Overall Sample | | S&P 500 Sample | | Sin Stocks Excluded | | Controversial Industries Excluded | |
|---|---|---|---|---|---|---|---|---|
| | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat |
| Long Good Short Bad | -0.0002 | (-0.20) | 0.0004 | (0.31) | -0.0002 | (-0.15) | -0.0002 | (-0.14) |
| Long Good Short Neutral | -0.0003 | (-0.38) | 0.0001 | (0.08) | -0.0003 | (-0.41) | -0.0007 | (-0.83) |
| *Long Good Short Grey* | -0.0006 | (-0.56) | -0.0007 | (-0.59) | -0.0006 | (-0.59) | -0.0010 | (-0.91) |
| *Long Bad Short Grey* | -0.0003 | (-0.39) | -0.0011 | (-0.87) | -0.0004 | (-0.49) | -0.0008 | (-0.79) |
| *Long Neutral Short Grey* | -0.0003 | (-0.27) | -0.0008 | (-0.70) | -0.0003 | (-0.29) | -0.0003 | (-0.27) |
| Long Neutral Short Bad | 0.0001 | (0.08) | 0.0003 | (0.23) | 0.0002 | (0.16) | 0.0006 | (0.50) |

**TABLE 9. ABNORMAL RETURNS OF INDIVIDUAL KLD SCORES, S&P 500 SAMPLE**

The table reports the abnormal returns of the portfolio returns on the four factor models that include MKT, SMB, and HML and Carhart (1997) MOM factors. The dependent variables are the excess stock returns (which subtract one-month Treasury bill rate) of S&P 500 firms from January 1992 to December 2011. Reported are the OLS estimates for six value-weighted long-short portfolios, such as Long Good Short Bad, Long Good Short Neutral, Long Good Short Grey, Long Bad Short Grey, Long Neutral Short Grey, and Long Neutral Short Bad portfolios. The results are based on the Strength and Concern KLD Score for the sub-dimension Community Involvement Score, Corporate Governance Score, Diversity Score, Employee Relations Score, Environment Score, and Product Score respectively. All alphas in the table are monthly figures. T-statistics reported are Newey-West (1987) standard errors with three lags. ***, **, and * represents the statistical significance at 1%, 5% and 10% level respectively.

| Portfolios | Community | | Corporate Governance | | Diversity | | Employee Relation | | Environment | | Product | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat | Alpha | t-stat |
| Long Good Short Bad | 0.0003 | (0.11) | -0.0028 | (-1.24) | -0.0017 | (-0.95) | 0.0007 | (0.51) | -0.0005 | (-0.24) | 0.0015 | (0.73) |
| Long Good Short Neutral | -0.0018 | (-1.44) | -0.0009 | (-0.44) | 0.0003 | (0.24) | -0.0001 | (-0.05) | -0.0014 | (-1.04) | -0.0002 | (-0.10) |
| *Long Good Short Grey* | 0.0016 | (0.77) | -0.0008 | (-0.27) | 0.0026 | (1.28) | -0.0005 | (-0.26) | 0.0010 | (0.47) | 0.0009 | (0.43) |
| *Long Bad Short Grey* | 0.0014 | (0.49) | 0.0010 | (0.48) | 0.0043* | (1.75) | -0.0012 | (-0.69) | 0.0015 | (1.01) | -0.0006 | (-0.24) |
| *Long Neutral Short Grey* | 0.0035* | (1.77) | -0.0002 | (-0.07) | 0.0023 | (0.99) | -0.0005 | (-0.23) | 0.0024 | (1.42) | 0.0011 | (0.57) |
| Long Neutral Short Bad | 0.0021 | (1.07) | -0.0020* | (-1.66) | -0.0020 | (-1.46) | 0.0007 | (0.59) | 0.0010 | (0.61) | 0.0016 | (1.25) |

**Figure 1: The Time Series of Net KLD Scores of Four Categories of Firms**

This figure presents the time trend of the net KLD scores for four categories of firms, namely "Good" firms, "Bad" firms, "Grey" firms, and "Neutral" firms according to the definition in Table 1. The data spans from January 1992 to December 2011. The net score is the social strength score minus the social concern score for each firm. The red dotted line represents the value-weighted net score of the "Good" firms. The green dashed line represents the value-weighted net score of "Bad" firms. The purple solid line represents the value-weighted net score of "Grey" firms. Lastly, the blue thin line with diamond marks represents the value-weighted net score of "Neutral" firms. The KLD score is value-weighted by the equity value of each firm every month.
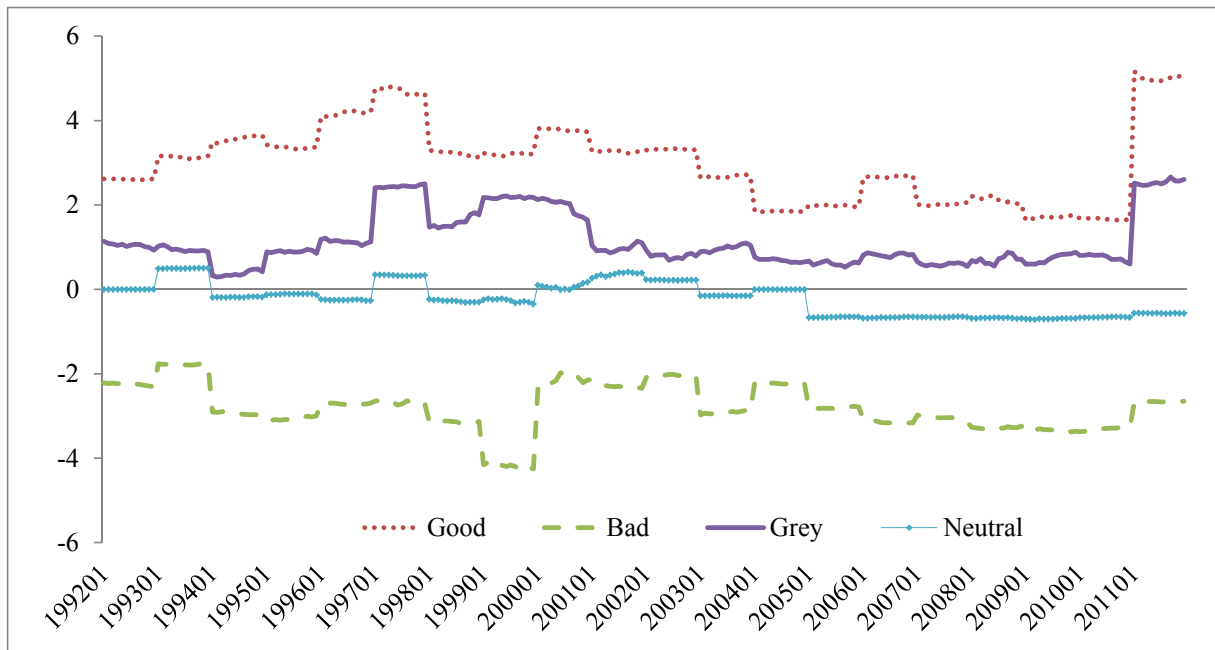
**Figure 2: The Time Series of the Stock Returns of Four Categories of Firms**

This figure presents the time trend of the value-weighted returns for four categories of firms, namely "Good" firms, "Bad" firms, "Grey" firms, and "Neutral" firms according to the definition in Table 1. The data spans from January 1992 to December 2011. The value-weighted return is the monthly return in excess of the risk-free rate proxied by one-month U.S. T-bill rate and is value-weighted by firm's equity in each category. The red dotted line represents the value-weighted return of the "Good" firms. The green dashed line represents the value-weighted return of "Bad" firms. The purple solid line represents the value-weighted return of "Grey" firms. Lastly, the blue thin line with diamond marks represents the value-weighted return of "Neutral" firms.