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Social Capital and Equity Prices

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Abstract

Social capital refers to "networks, norms, and trust that facilitate action and cooperation for mutual benefit" (Putnam, 1995). We propose a novel firm-level time-varying social capital measure based on firms' 10-K filings that captures the firm's operational exposure to social capital and examine its impact on equity prices. This measure is positively and significantly correlated with future returns, above and beyond the effects of governance indices. A zero-cost portfolio that is long in high and short in low social-capital firms earns a risk-adjusted annual return of 6.41%, with a T-statistic over 3. Investors do not fully incorporate the benefits of a firm's exposure to social capital in equity prices. Firms with greater exposure to high social capital regions are more likely to have positive earnings surprises and are associated with higher post-earnings announcement drifts. Our results are robust to using newer measures of social capital (Chetty et al., 2022a,b).

Keywords: Social capital, Risk premium, Textual analysis.

JEL classification: G11, G12, G14, G17.

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1. Introduction

As an imperative construct, social capital refers to networks, norms, and trust among community members, facilitating cooperation and significant benefits for communities, corporations, and individuals (Coleman, 1988; Putnam, 1995; Knack and Keefer, 1997; Posner, 2009; Buonanno et al., 2009; Hasan et al., 2017a). Social capital is locally endowed and embedded across specific regions (Rupasingha et al., 2006; Guiso et al., 2004, 2011; Hawes et al., 2013; Pasiouras and Samet, 2022). Therefore, the literature has mainly considered a region-specific measure of social capital. For example, in Putnam (1995), social capital is measured based on survey data at the US state level and is static. However, it remains unclear how social capital is associated with a cross-section of stock returns, with a focus on firms' exposure to different locations and their social capital thereon, which is arguably less salient. This study proposes a novel firm-level measure of social capital and examines the relationship between social capital and the cross-section of stock returns.

Using a sample from 1994 to 2021 and following Garcia and Norli (2012), we count the number of times each firm mentions the names of US states in their annual (i.e., 10-K) filings. We focus only on the following sections: Item 1: Business, Item 2: Properties, Item 6: Consolidated Financial Data, and Item 7: Management's Discussion and Analysis, where firms are expected to discuss their business operations. We argue that a firm's operational presence in each state can be proxied by the number of times it mentions a particular state in its annual filing of that specific year. For instance, Apple referred to California 12 times and New Mexico six times in its 1996 10-K filing. However, it mentioned California only three times and with no mention of New Mexico in its 2016 10-K filing. It demonstrates the fluidity in a firm's business operations depending on the weight it puts on its operations in each state over the years. Therefore, we construct our firm-level social capital as a weighted average of Putnam (1995) state-level social capital measure using the state name mentionings as weights.

Using this novel measure, standard portfolio analysis shows that a long-short, zero-cost hedge portfolio long in the top quintile social capital portfolio and short in bottom quintile social capital portfolio earns an economically and statistically significant risk-adjusted return of 0.53%, equivalent to an annual return of 6.41%, after accounting for Fama-French five factors (Fama and French, 2015) and the momentum factor. Our results remain robust to value-weighted or equal-weighted portfolios and other sorting schemes, such as terciles, quartiles, and deciles. Further subsample analysis shows that social capital has stronger return predicting power in larger, growth firms with high profitability and asset growth, thus less likely a limits-to-arbitrage phenomenon. We also conduct Fama-MacBeth cross-sectional regressions to control for more firm-level return drivers, especially governance measures commonly used in the literature, such as entrenchment index (Bebchuk et al., 2009), takeover index (Cain et al., 2017), and CSR (Lins et al., 2017). Our results remain robust after controlling for these governance indices, suggesting that our measure captures distinct information above and beyond the traditional governance measures.

Since our measure of firm-level social capital captures a very different set of information than the measures used in prior literature and is deeply embedded in firm filings, it might be difficult for investors to process (i.e., less salient). Thus, understanding the value-relevant implications of social capital based on a firm's business operations is not straightforward. Hirshleifer (2001); Song and Schwarz (2010); Hirshleifer et al. (2018); Ang et al. (2022) document that investors remain inattentive to difficult-to-process information, leading to the relative underpricing of firms to that material information. In our context, we expect investors' inattention to value-relevant information contained in the firm-level social capital to lead to underpricing (overpricing) of firms with high (low) social capital. To examine this hypothesis, we examine the relationship between earnings announcement and social capital. We find that the return predictability of social capital is strongest when there is no earnings announcement or zero earnings surprise. Whereas the predictability disppears when there are earnings surprises. This suggests that social capital measure is associated with high level of uncertainty with respect to value, which gets resolved when earnings are released and beliefs are updated. Furthermore, we find that social capital is positively correlated with standard unexpected earnings and post-earnings announcement drift. This corroborates our hypothesis that social capital contains value-relevant information that is under-appreciated by investors.

This study contributes to the existing literature in several ways. First, prior studies have documented the role of value-relevant information contained in social capital and its impact on bank loans, credit ratings, audit fees, financial statement readability, cost of equity, tax avoidance, managerial rent extraction, and the likelihood of fraud (e.g. Jha and Chen, 2015; Hasan et al., 2017a,b; Gupta et al., 2018; Hoi et al., 2019; Jha, 2019; Pasiouras and Samet, 2022; Hossain et al., 2023). For instance,Hasan et al. (2017a) document that banks charge lower loan spreads from firms headquartered in high social capital regions. Similarly, Hossain et al. (2023) posit that credit ratings are stronger for high social capital firms. Other studies (e.g. Hoi et al., 2019; Jha, 2019) discussed the role of social capital in restraining managerial rent extraction and the likelihood of fraud. These studies mainly considered a region-specific measure of social capital, as social capital is locally endowed and embedded across specific regions. Our study extends this line of research by proposing a novel region-weighted firm-level measure of social capital, and examining its relationship with stock returns.

Second, several studies have argued that investors remain inattentive to difficult-to-process (i.e., less salient) material information (e.g. Merton, 1987; Hong and Stein, 1999; Hirshleifer, 2001; DellaVigna and Pollet, 2009; Hwang and Kim, 2017). Hirshleifer and Teoh (2003); Peng and Xiong (2006); Ang et al. (2022) hypothesize that the limited ability of investors to process value-relevant but less salient information leads to an underreaction and a delayed price reaction. Our study contributes to this literature by investigating the relationship between firm-level social capital and earnings surprises. Our proposed measure of social capital is less observable as it requires investors to aggregate detailed information from annual filings, leading to a delayed price response from investors.

Finally, our study also extends the findings of Lins et al. (2017), who examine the relationship between social capital, using CSR scores as a measure of firm-level social capital, and firm value during the 2008-2009 global financial crisis. The authors find that high social capital firms experienced higher returns (approximately four to seven percentage points higher) than low social capital firms during the financial crisis. Unlike Lins et al. (2017), which assumes that firms could build their social capital through CSR activities, our study suggests that social capital is a distinct measure that contains very different information than CSR.

The rest of the paper is organized as follows: Section 2 describes the data and the methodology to construct the social capital measure; Section 3 presents the key results on the relationship between social capital and stock returns; Section 4 explores possible economic mechanisms; Section 5 reports robustness tests; Section 6 concludes.

2. Data

Our main data source includes the state-level social capital measure as defined in Putnam (1995) and firm annual 10-K filings. The social capital measure is from Robert D. Putnam's website.[1] The 10-K filings are from the University of Notre Dame Repository website.[2] The stock price and return data are from the CRSP. Accounting data are from Compustat. Asset pricing factors are from Kenneth French's website.[3] Next, we discuss the construction of our time-varying firm-level social capital measure.

[1] *Robert D. Putnam*, http://bowlingalone.com/.
[2] *Bill McDonald, University of Notre Dame*, https://sraf.nd.edu/data/stage-one-10-x-parse-data/.
[3] *Kenneth French*, 2019, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

2.1. Measuring Firm-Level Social Capital

Social capital refers to "networks, norms, and trust that facilitate action and cooperation for mutual benefit" (Putnam, 1995). It is related to but distinct from corporate governance. The two measures are related because both foster cohesion and thus can be believed to improve firm performance. They are distinct since governance is more likely developed within the organization, while social capital is better described as "endowed" from one's social environment in the firm's context.

Because of its strong community perspective, social capital is usually defined locally and is rather sticky. For example, in Putnam (1995), social capital is measured based on survey data at the state level and is static. We plot the state-level social capital scores as a heat map in a United States map in Figure 1.

[Fig. 1 about here.]

As shown in the figure, the depth of the color indicates the level of social capital for each state, where the lighter the color, the higher the social capital score. The state with the lowest social capital score is Nevada at -1.43, while the state with the highest social capital score is North Dakota at 1.71.

As illustrated by the static figure, the traditional measure of social capital is inadequate in describing a firm's exposure to it since it lacks sufficient variation. We overcome this difficulty by recognizing that although social capital is sticky locally, a firm's operations are fluid. Thus its exposure to social capital varies because its operations vary in location. It follows that if we can measure the degree of changes in where a firm focuses its operations, then we can construct a time-varying measure of social capital.

Using this logic, we first follow Garcia and Norli (2012) and count the number of times each firm mentions the names of US states in their 10-K filings. We only count in the following sections: "Item 1: Business", "Item 2: Properties", "Item 6: Consolidated Financial Data", and "Item 7: Management's Discussion and Analysis". Then each firm's operation presence in each state can be proxied by the number of times the firm mentions the state. To illustrate the firm's change of operation focus, we plot the number of times Apple Inc. mentions each state name in its 10-K reports in 1996 and 2016 separately in Figure 2.

[Fig. 2 about here.]

As shown in the figure, the deeper the color, the fewer times Apple mentions the state. For example, Apple mentions California 12 times in 1996 and 3 times in 2016. It mentions New Mexico 6 times in 1996 and does not mention it at all in 2016. This demonstrates the fluid nature of firms' operation focuses over the years.

After getting the number of times each firm mentions each state in 10-K, we compute each state's weight for the firm by scaling the number by the total number of times the firm mentions all states. We then multiply this weight by the social capital measure at the state level and arrive at a firm-level measure of social capital.

Formally, denote state-level social capital measure as $SocialCap_j$, where $j \in [1, 2, ..., 49]$ represents the 49 contiguous states of the US. Denote firm i's number of times mentioning state j in year t as $n_{i,j,t}$. Then a firm's overall social capital exposure in year t is:

$$SocialCapital_{i,t} = \frac{\sum_j SocialCap_j \times n_{i,j,t}}{\sum_j n_{i,j,t}} \tag{1}$$

Thus a firm's social capital exposure is a weighted average depending on the weight the firm puts its operations in each state. We average all firms' social capital measures each year and plot the time series of means in Figure 3.

[Fig. 3 about here.]

The figure shows two things. First, there is a general uptrend, which indicates that firms are on average moving their operations to high social capital states. Specifically, at the beginning of our sample in the year 1993, the mean social capital for all firms is -0.158, while at the end of our sample in the year 2016, the mean social capital of all firms is -0.133. The average change in mean social capital is 0.025 with a T-statistic of 1.92. Thus, there is a significant improvement in mean social capital across all firms over our sample period. Second, the mean social capital measure across firms stays negative at all times. This indicates that on average firms prefer to operate in low social capital states.

Next, we want to examine whether social capital varies across industries, as different industries might have their preferred states for operation, which could lead to industry clusters of the social capital measure. Thus we average the social capital measure within each Fama-French 17 industry (Fama and French, 1997) in our pooled sample. The results are shown in Figure 4.

[Fig. 4 about here.]

The figure shows great heterogeneity in social capital across different industries. The industry with the lowest mean social capital measure is textiles, apparel, and footwear, at lower than -0.30. In comparison, the industry with the highest mean social capital measure is machinery and business equipment at approximately -0.07.[4]

[4] We show in Section 5 that our main results are not driven by industry effects.

2.2. *Summary Statistics*

We report summary statistics of our social capital measure and other firm characteristics across our pooled sample in Table 1.

[Table 1 about here.]

Next, we report the pairwise correlations among all the variables in Table 2. We omit the upper triangle to aid visibility.

[Table 2 about here.]

Table 2 shows that our social capital measure has moderate correlations with the other firm characteristics. In particular, it does not seem to be highly correlated with other corporate governance indices. The only notable correlation appears to be between our social capital measure and the static social capital measure (OldSocialCap) commonly used in the literature, where they use the social capital of the county where the firm's headquarter is located. Since both measures stem from Putnam (1995), it is reasonable to see a moderately positive correlation between the two. Next, to further examine whether our social capital measure can be largely explained by other firm characteristics and governance indices, we regress our social capital measure on the other variables, and report the results in Table

[Table 3 about here.]

Table 3 shows that the results are consistent with the correlation matrix that social capital is moderately correlated with firm characteristics and governance indices. The moderate coefficients and the low R-squareds suggest that our social capital measure is not a simple substitute for governance and other firm characteristics. One notable result is that social capital seems to be significantly and positively correlated with corporate social responsibility, suggesting that firms with high CSR score is more likely to have a high level of social capital as well.

3. Social Capital and Stock Returns

In this section, we examine the relationship between social capital and the cross-section of stock returns. Prior literature suggests that firms with high (low) social capital have a low (high) cost of equity (cite) and high (low) firm valuation (Gupta et al., 2018). Though this literature differs significantly from the present study in that it relies on the assumption that the social capital of the location of a firm's headquarters is representative of the entire firm's exposure to social capital. It can be argued that corporate culture can be trickled down through the firm's organizational structure from the management. Social capital, however, is endowed and embedded in a firm's different locations. Thus by summing up a firm's exposure to different states' social capital, we are capturing very different information than the measure used in prior literature. Therefore, we conduct standard asset pricing tests to examine how our social capital measure correlates with the cross-section of stock returns.

3.1. Portfolio Analysis

We start the analysis with portfolio pricing tests. At the end of June of year t, we sort the universe of stocks into tercile, quantile, quintile, and decile portfolios based on their social capital measure in year $t-1$. We then compute the value-weighted and equal-weighted returns of each portfolio based on their lagged market capitalization at the end of year $t-1$. The sample starts from July 1994 to June 2021, following the timing convention in Fama and French (1996). For a stock to be included in our sample, we require that the stock price is greater than $1 at the beginning of the portfolio formation each year.

We then regress the long-short high-minus-low hedge portfolio returns on the Fama-French five factors (Fama and French, 2015) and then augmented with a momentum factor. We report the alpha estimates and their associated standard errors in Panel A of Table 4.

[Table 4 about here.]

As shown in Panel A of Table 4, the hedge portfolios that are long in high social capital firms and short in low social capital firms earn a consistently positive monthly risk-adjusted return with T-statistics greater than 3. If we annualize the quintile value-weighted high-minus-low alpha, the long-short zero-cost portfolio earns a 6.41% return above and beyond common risk factors. These results are robust to value-weighted or equal-weighted portfolios and various sorting schemes.

Next, we examine whether there are heterogeneous returns on social capital conditioning on firm characteristics. Specifically, each month, we divide the universe of stocks into two groups – above the median, and below the median, by the following characteristics: market capitalization, book-to-market ratio, gross profitability, asset growth, momentum, idiosyncratic risk, illiquidity (Amihud, 2002), and institutional ownership. Then for each subgroup, we form a hedge portfolio where we long top-quintile social capital stocks and short bottom-quintile social capital stocks. We then regress each hedge portfolio's value-weighted returns on Fama-French five factors (Fama and French, 2015) and momentum factor. We report the alpha estimates and their associated standard errors for each group in Panel B of Table 4.

We see from the table that the long-short zero-cost portfolio earns higher risk-adjusted returns in firms that have a high market capitalization, high growth (low B/M), high profitability, aggressive asset growth, high idiosyncratic risk, and more liquid trading. Institutional ownership does not seem to be a driving factor for differential alphas. These results show that our results are not driven by small and illiquid stocks. On the contrary, it is the more liquid and larger stocks where we observe higher and more significant alpha estimates. Therefore, it is less likely that limits to arbitrage have created return predictability.

3.2. Cross-Sectional Regressions

The results from portfolio analysis show strong support for our hypothesis that firms' social capital exposure is an important driver of expected returns. Nonetheless, it could be the case that social capital is merely correlated with other proven return predictors such that it is simply a linear transformation for these variables. To address this concern, we also conduct Fama-MacBeth cross-sectional regressions (Fama and MacBeth, 1973) to control for other important return drivers. Each month, we regress stock returns on social capital and other firm characteristics and save the coefficients. Then we average the coefficients across the time series of our sample period. Apart from our social capital measure, we control for the natural log of market capitalization, the natural log of book-to-market ratio, gross profitability, asset growth, momentum (past 11-to-1 month return), short-term reversal (previous month return), idiosyncratic risk (Ang et al., 2006), and illiquidity (Amihud, 2002). We report the results in Table 5.

On top of the common risk characteristics, we are particularly interested in whether the return predictability of social capital would disappear if we included other governance indices. Column (2) adds Takeover Index (Cain et al., 2017).[5] Column (3) adds Entrenchment Index (Bebchuk et al., 2009). Column (4) adds board co-option measure (Coles et al., 2014). Column (5) adds the CSR measure (Lins et al., 2017). Column (6) replaces the dependent variable with the Fama-French 48-industry-adjusted excess returns (Fama and French, 1997). Column (7) removes our social capital measure and replaces it with the static social capital measure used in prior literature (Old SocialCap).

[Table 5 about here.]

As shown in the table, our measure of social capital is significantly and positively correlated with future stock returns across all specifications, even after controlling for other

[5]We linearly interpolate the entrenchment index and the takeover index at the firm level to fill in the years when firms do not have observations.

firm characteristics. Importantly, in the second column, we added the geographical diversity measure (Garcia and Norli, 2012) as an additional control variable. Because our social capital measure is built on the insight of the geo-diversity measure, there might be concerns that our measure is simply a transformation of geo-diversity and thus does not contain additional information. However, the coefficient on social capital remains statistically significant, effectively alleviating this concern. More importantly, our social capital measure remains statistically significant after controlling for various governance indices. This provides evidence that social capital contains information above and beyond and is distinct from governance measures. In Column (6), when we use Fama-French 48-industry-adjusted returns as the dependent variable, the coefficient of our measure of social capital remains statistically significant, resolving the concern that this might be driven by industry effects. Moreover, when we remove our measure and replace it with the conventional "static" social capital measure used in the literature, the coefficient on "Old SocialCap" is statistically and economically insignificant. This suggests that the social capital measure used in prior literature cannot span the cross-section of stock returns, possibly due to the lack of variation. These results corroborate our portfolio analysis that social capital is an important state variable that drives expected stock returns above and beyond conventional risk factors and governance measures.

4. Economic Mechanism

In this section, we explore possible economic mechanisms that might explain the return predictability of social capital. As seen in the previous section, the long-short hedge portfolio profits are concentrated in large, high-growth, and liquid firms. Thus the return predictability is less likely driven by the usual argument of limits to arbitrage. Instead, our social capital measure might be difficult for investors to perceive, since they need to aggregate information from firm filings. Therefore, it would take time to reveal the value of social capital in stock returns.

As a result of this thought experiment, we examine earnings surprises, because earnings announcement resolves previous uncertainty about a firm's future earnings power, and this uncertainty might be a source of mispricing for high-social-capital firms. If this hypothesis is correct, then when firms announce their earnings that are different from analyst consensus, uncertainty resolves and social capital should have much less ability to predict that month's returns. On the other hand, when there is no earnings announcement, or when there are no earnings surprises, the uncertainty is high, and thus social capital would have a higher ability to predict returns. To test this hypothesis, we follow Livnat and Mendenhall (2006) and define standard unexpected earnings (SUE) as follows:

$$SUE_{j,t} = \frac{EPS_{j,t} - MedForecast_{j,t}}{P_{j,t}} \tag{2}$$

We follow Livnat and Mendenhall (2006) and apply the following filters. Drop missing values in the earnings announcement date and price per share from Compustat at fiscal quarter-end; stock price is greater than \$1; firm market capitalization is greater than \$5 million; valid market and the book value of equity at fiscal quarter-end; and the earnings announcement dates from Compustat and from IBES should not differ from each other by more than one calendar day. We compute three measures of SUE based on Livnat and Mendenhall (2006): (1) the actual value is extracted from Compustat, and the expected value is the prior year's actual value extracted from Compustat; (2) the same as (1) except that the actual values are adjusted by subtracting special items scaled by 0.65; (3) both the actual value and expected value are extracted from IBES.

We conduct the following tests. For each measure of SUE, we separate the sample into two parts – one where $SUE \neq 0$ and the other where $SUE = 0$. Then we run Fama-MacBeth regressions of stock returns on social capital and other firm characteristics, with SUE as an additional control when $SUE \neq 0$. The purpose is to see whether earnings surprises would subsume the social capital's ability to predict returns. The results are shown in Table 6.

[Table 6 about here.]

As shown in the table, when there is an earnings surprise in the month, the coefficient on social capital is statistically and economically insignificant, meaning that social capital has effectively no predicting power for stock returns. Whereas when there is no earnings announcement or when there is no earnings surprise, the coefficient on social capital is positive and statistically significant, consistent with our results in Table 5, meaning that social capital has strong predicting power for stock returns during these months.

Next, we want to examine whether there is a positive relationship between social capital and SUEs. By definition, SUEs are unexpected and difficult to forecast. If social capital is positively correlated with SUEs, then it could help explain the positive return predictability. Based on this hypothesis, we first group the universe of stocks into five quintile groups based on social capital, and then we compute the simple average of SUEs for the five groups and their standard errors. The results are shown in Figure 5.

[Fig. 5 about here.]

Figure 5 shows a moderate positive relationship between social capital and SUEs. Though the relationship is not monotonic, high-social-capital firms do seem to have much higher SUEs than low-social-capital firms. Following this logic, high-social-capital levels then should also associate with stronger post-earnings announced drift (PEAD). Therefore, we form five quintile portfolios each year based on the prior fiscal year's social capital measures, and then compute the cumulative post-earnings announcement excess returns for 50 trading days after each announcement day. We average these returns within each quintile groups across our sample period from 1994 to 2021. We plot the resulting five series of mean PEAD in Figure 6.

[Fig. 6 about here.]

Figure 6 shows clear patterns that conform to our hypothesis. High (low) social capital portfolios tend to have high (low) post-earnings announcement excess returns especially in the later period of the 50 trading days. These results provide evidence that the value of social capital gets incorporated into prices slowly and thus leads to return predictability.

5. Robustness Tests

In this section, we conduct various tests to check the robustness of our findings.

5.1. Alternative Social Capital Measure

There might be a concern that the base social capital measure by state (Putnam, 1995) might be outdated and that our results are dependent on this single measure. To alleviate this concern, we run a separate test using a new social capital measure proposed by Chetty et al. (2022a,b). They use Facebook data to infer the strengths of relationships and communities in the US. According to their study, there are three measures of social capital: cohesiveness, economic connectedness, and civic engagement. Specifically, they produce two measures for cohesiveness – "clustering_county" and "support_ratio_county", and two measures for civic engagement – "volunteering_rate_county" and "civic_organizations_county", and finally one measure for economic connectedness – "ec_county". We choose their county-level measures to align with our measures.

To arrive at a state-level measure of alternative social capital that aligns with our measure, we make the following adjustments. First, without any prior belief about which of the three social capital measures is more important, we take a simple average to arrive at a county-level aggregate social capital measure:

$$SC_{county} = \frac{1}{3}ec\_county + \frac{1}{6}clustering\_county + \frac{1}{6}support\_ratio\_county \tag{3}$$
$$+ \frac{1}{6}volunteering\_rate\_county + \frac{1}{6}civic\_organizations\_county \tag{4}$$

Then, we use the population of each county within a state as the weight to compute a weighted average social capital measure for the state as follows:

$$SC_{state} = \frac{\sum_j SC_j \times Population_j}{\sum_j Population_j} \tag{5}$$

Where j indexes the county within that particular state. Importantly, we find this alternative state-level social capital measure has a significant correlation of approximately 79.2% with the measure from Putnam (1995).

Finally, we repeat the computation as in Equation 1 to arrive at an alternative firm-level social capital measure. We use this alternative measure to run portfolio analyses as in Panel A of Table 4, where we long high-social-capital firms and short low-social capital firms. We report the resulting alpha estimates and their associated standard errors in Table 7.

[Table 7 about here.]

Consistent with our results, the alternative social capital measure seems to produce positive alpha estimates, albeit with weaker statistical significance. In addition, it is worth noting that this measure is not tradable, since the measure was only published in 2022. Nonetheless, the results are illustrative that firm-level social capital is positively correlated with future stock returns, supporting our main hypothesis.

6. Conclusion

In high social capital regions, people share common beliefs of being more selfless and transparent, viewing self-interested and opportunistic behavior as a contradiction of social norms. Prior studies have documented the value-relevant implications of social capital on credit ratings, loan spreads, audit fees, cost of equity, managerial rent extraction, and fraud likelihood. However, given that social capital is locally endowed and embedded, these studies have mainly considered a region-specific measure of social capital. Unlike previous studies, this study examines the relationship between social capital, measured based on firms' exposure to different locations, and the cross-section of stock returns. Thus, we propose a novel measure of firm-level social capital, considering the geographical presence of firms.

We find that our measure of social capital captures a different set of information than the measures used in prior literature. Firm-level social capital provides incremental societal monitoring of managerial behavior even after controlling for corporate governance, CSR, and other firm-level characteristics. Firms with high social capital generate higher returns for investors than low social capital firms. This positive risk-adjusted return is more pronounced for firms with high market capitalization, low book-to-market ratio, high gross profitability, high asset growth, and low illiquidity, suggesting that small and illiquid stocks or limits to arbitrage fail to drive our results.

Exploring the potential mechanism, we find that the return predictability of social capital is strongest when there is no earnings surprise. When there is, the predictability disappears. Investors seem to underreact to earnings announced by high social capital firms. High social capital is associated with a higher post-earnings announcement drift (PEAD).

Overall, our study suggests that investors' slow reaction to the information contained in firm-level social capital leads to an underpricing (overpricing) of high (low) social capital firms. Therefore, these findings bear important implications for investors while devising their portfolio strategies in the future.

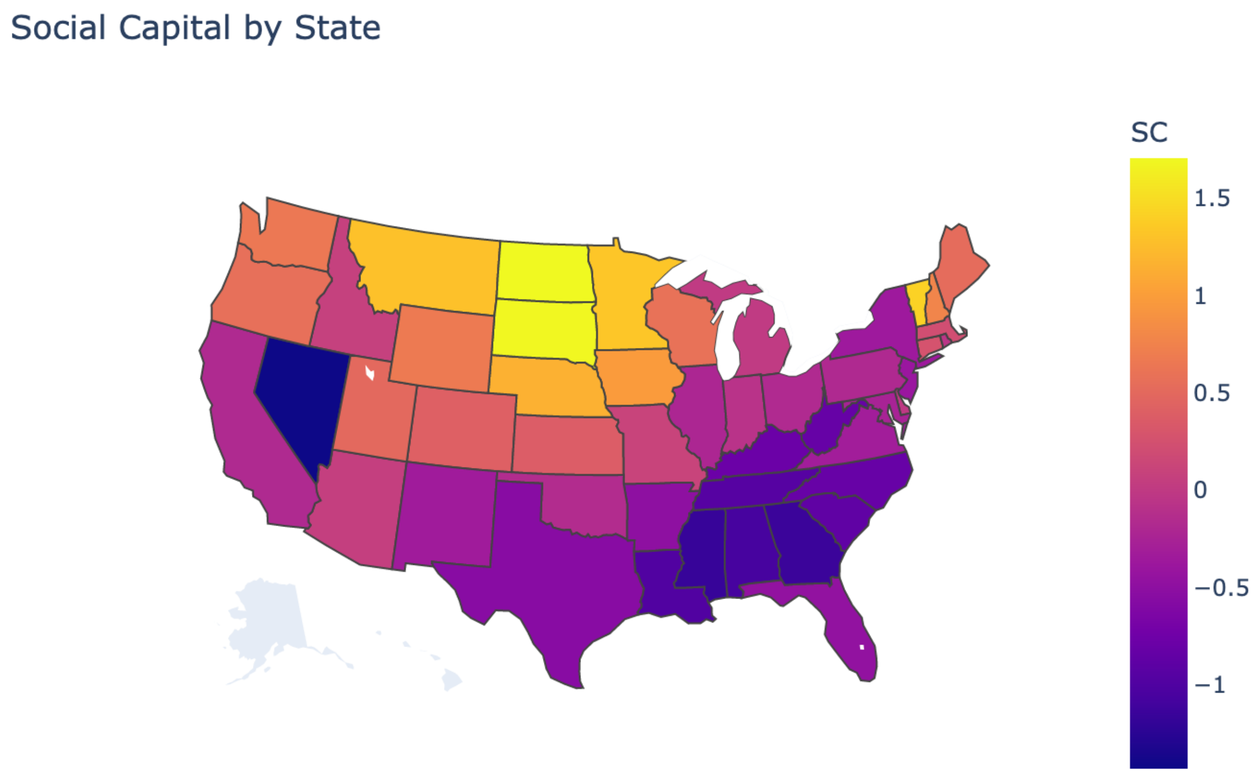
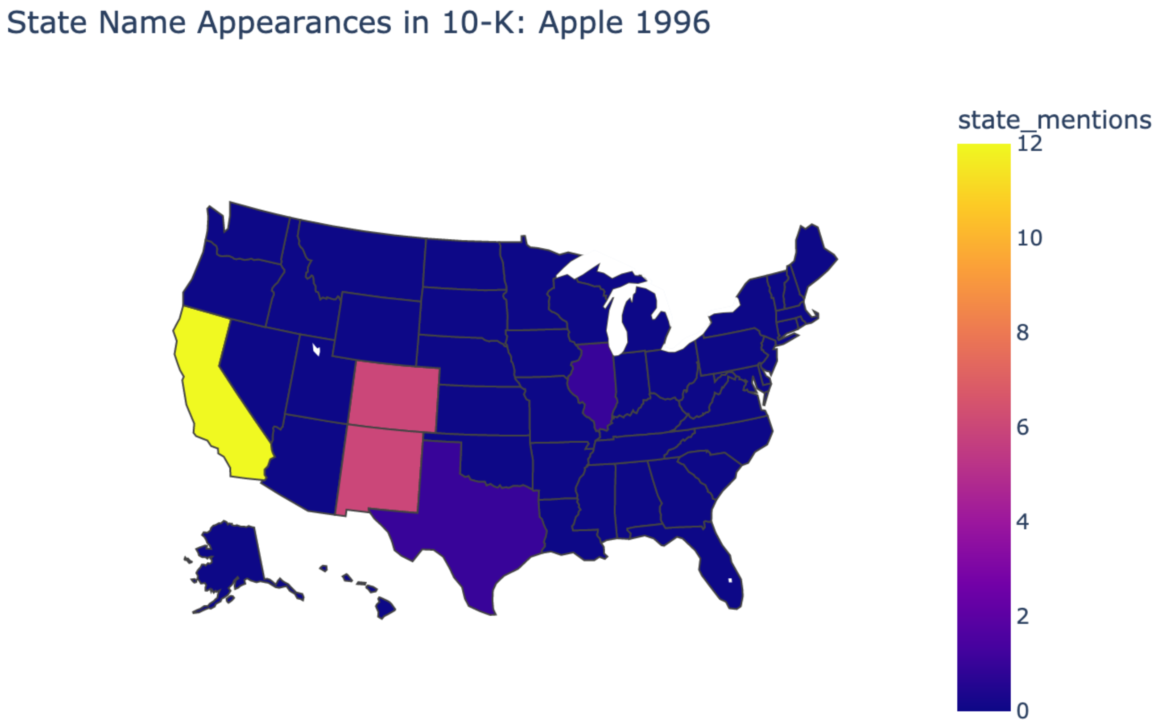


Fig. 1. Social Capital by State. This figure plots the state-level social capital scores as in Putnam (1995). The color's depth indicates the social capital level for each state, where the lighter the color, the higher the social capital score. The state with the lowest social capital score is Nevada at -1.43, while the state with the highest social capital score is North Dakota at 1.71.



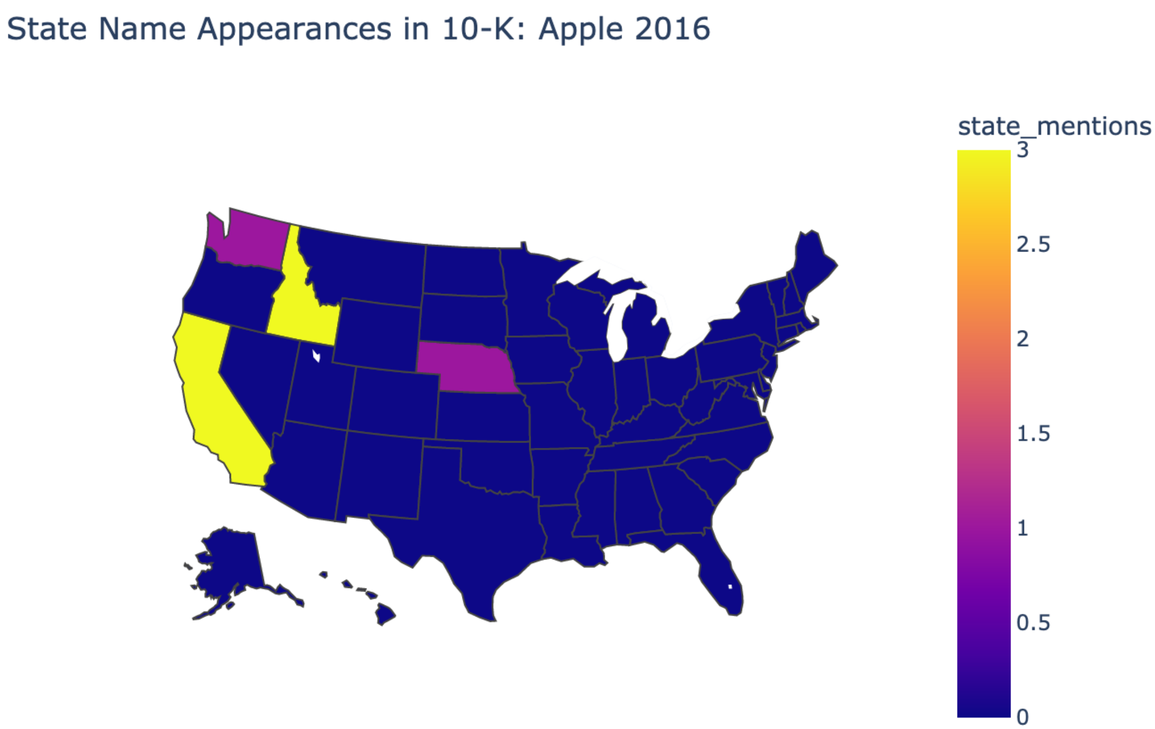


Fig. 2. Apple's Mentioning of States in 10-K. This heatmap plots the number of times Apple Inc. mentions each state name in its 10-K reports in 1996 and 2016 separately. The deeper the color, the fewer times Apple mentions the state. For example, it mentions New Mexico 6 times in 1996 and does not mention it at all in 2016.

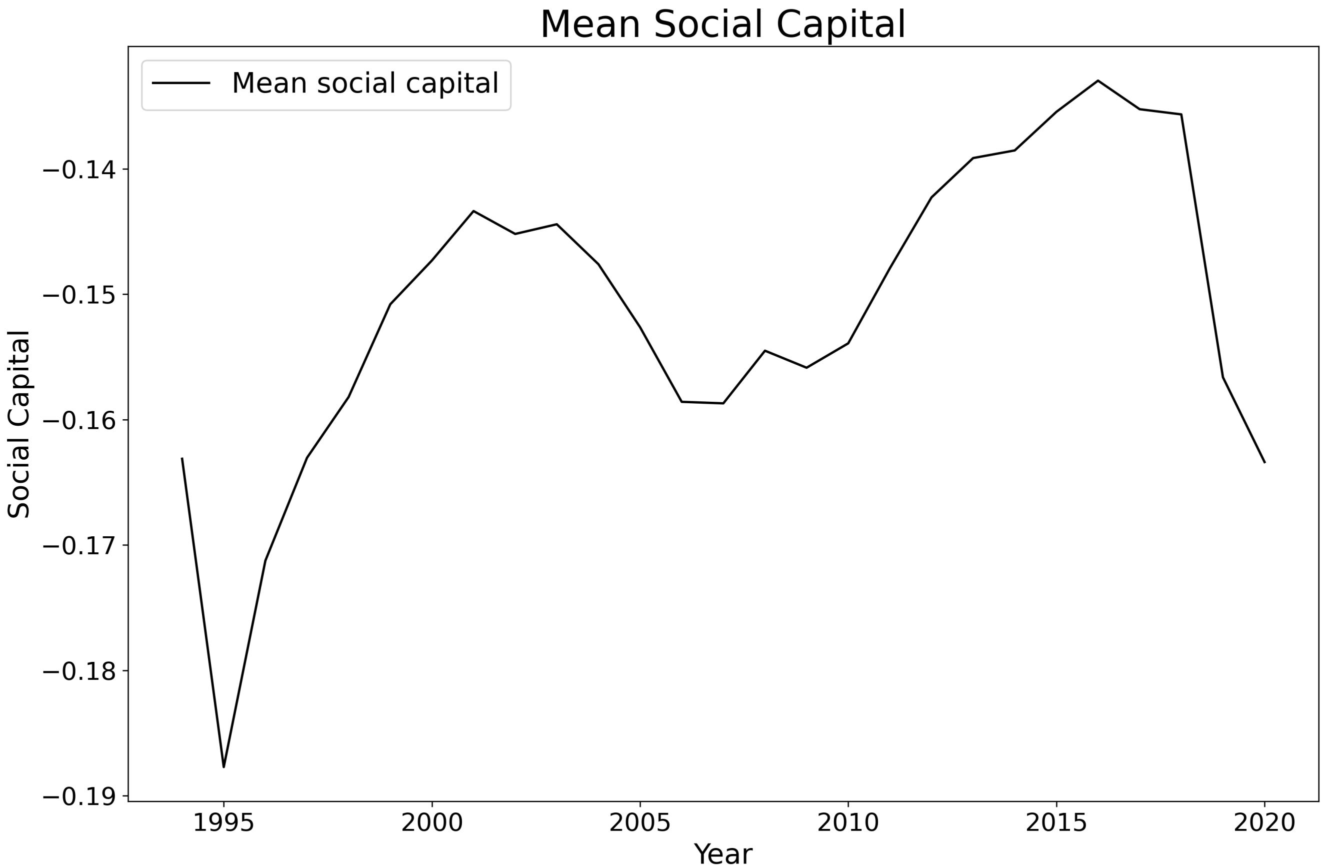


Fig. 3. Mean Social Capital. This figure plots the mean social capital across all firms each year across our sample period from 1994 to 2020. Firm-level social capital is the sum of the weighted number of times a firm mentions each congruous state in its 10-K multiplied by the state-level social capital. Denote state-level social capital measure as $SocialCap_j$ as in Putnam (1995), where $j \in [1, 2, ..., 49]$ represents the 49 contiguous states of the US. Denote firm i's number of times mentioning state j in year t as $n_{i,j,t}$. Then a firm's overall social capital exposure in year t is:

$$SocialCapital_{i,t} = \frac{\sum_j SocialCap_j \times n_{i,j,t}}{\sum_j n_{i,j,t}}$$

We follow Garcia and Norli (2012) to count the state names in "Item 1: Business", "Item 2: Properties", "Item 6: Consolidated Financial Data", and "Item 7: Management's Discussion and Analysis". We follow the timing convention of Fama and French (1996) and define a year as from July of year t to June of year $t+1$. At the beginning of our sample in the year 1993, the mean social capital for all firms is -0.163, while at the end of our sample in the year 2020, the mean social capital is also -0.163. The peak is -0.133 in 2016, and the trough -0.188 in 1995.

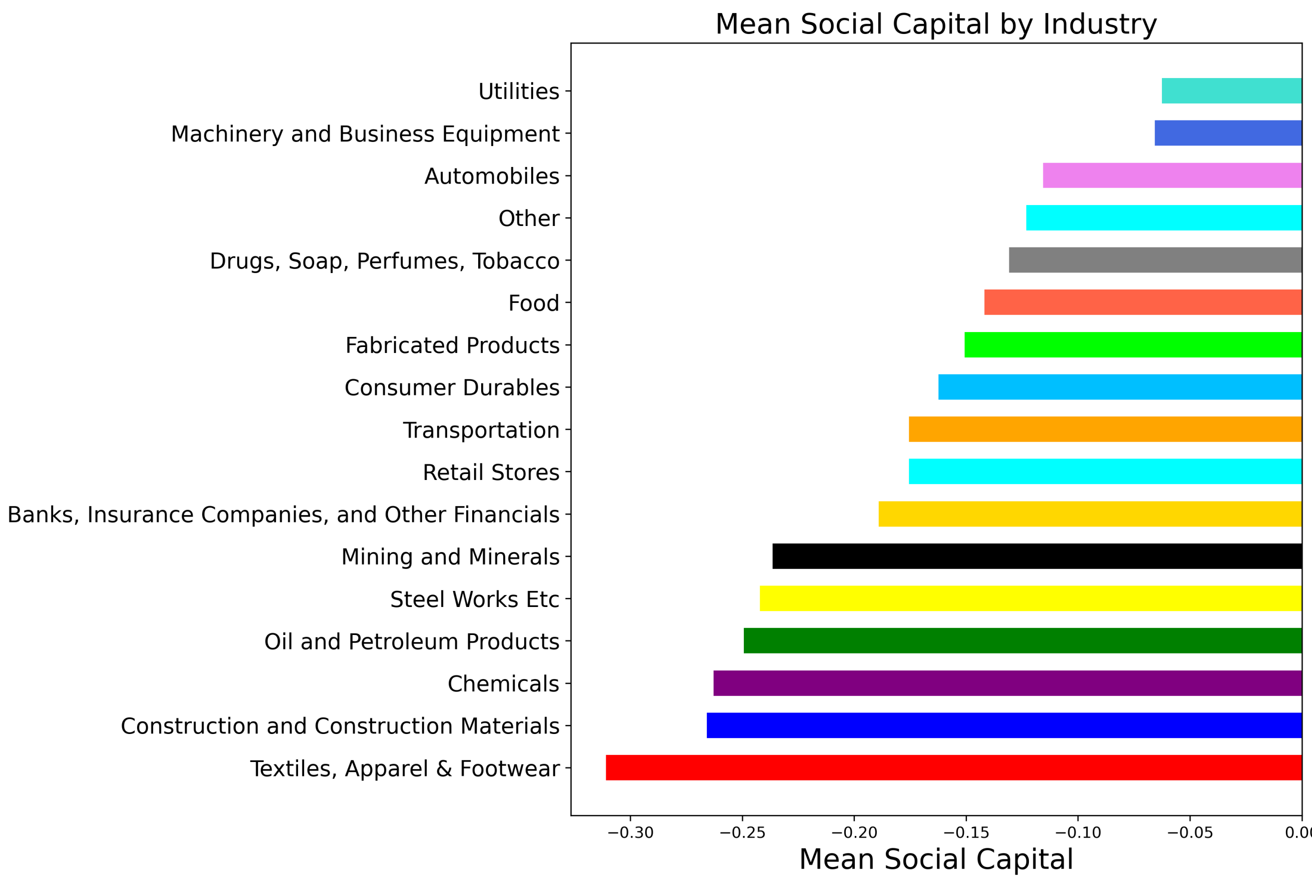


Fig. 4. Mean Social Capital by Industry. This figure plots the mean social capital within each Fama-French 17 industry (Fama and French, 1997) across our pooled sample from 1993 to 2016. Firm-level social capital is the sum of the weighted number of times a firm mentions each congruous state in its 10-K multiplied by the state-level social capital. We follow Garcia and Norli (2012) to count the state names in "Item 1: Business", "Item 2: Properties", "Item 6: Consolidated Financial Data", and "Item 7: Management's Discussion and Analysis". Since all mean social capital is negative, the shorter the bar, the higher the social capital.

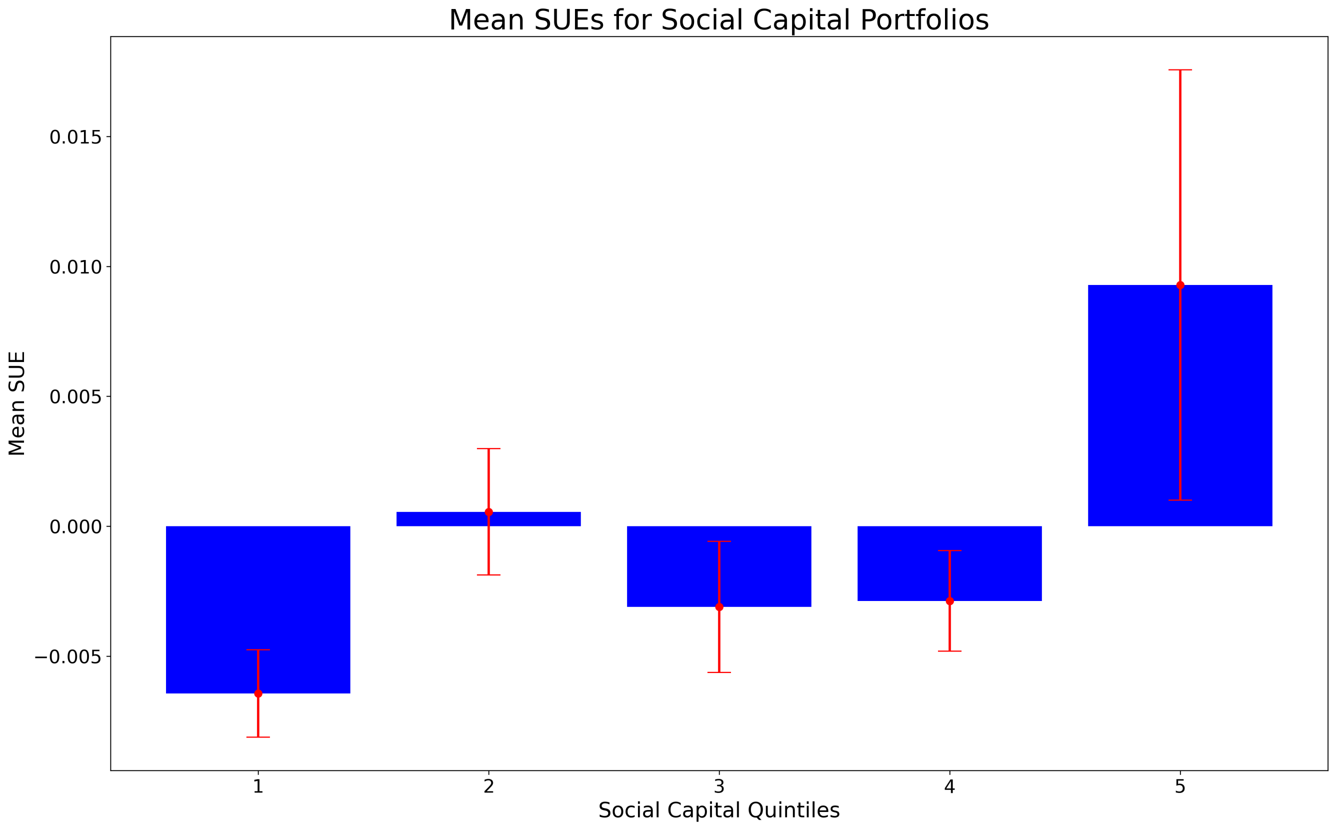


Fig. 5. Mean SUEs by Social Capital. This figure plots the mean standard unexpected earnings (SUE) by social capital. We first group the universe of stocks into five quintile groups based on social capital, and then we compute the simple average of SUEs for the five groups and their standard errors. The SUE is defined as Equation 2. The blue bars are mean SUEs for the five social capital groups, and the red bars are standard errors of each group. The sample period is from July 1994 to June 2021.

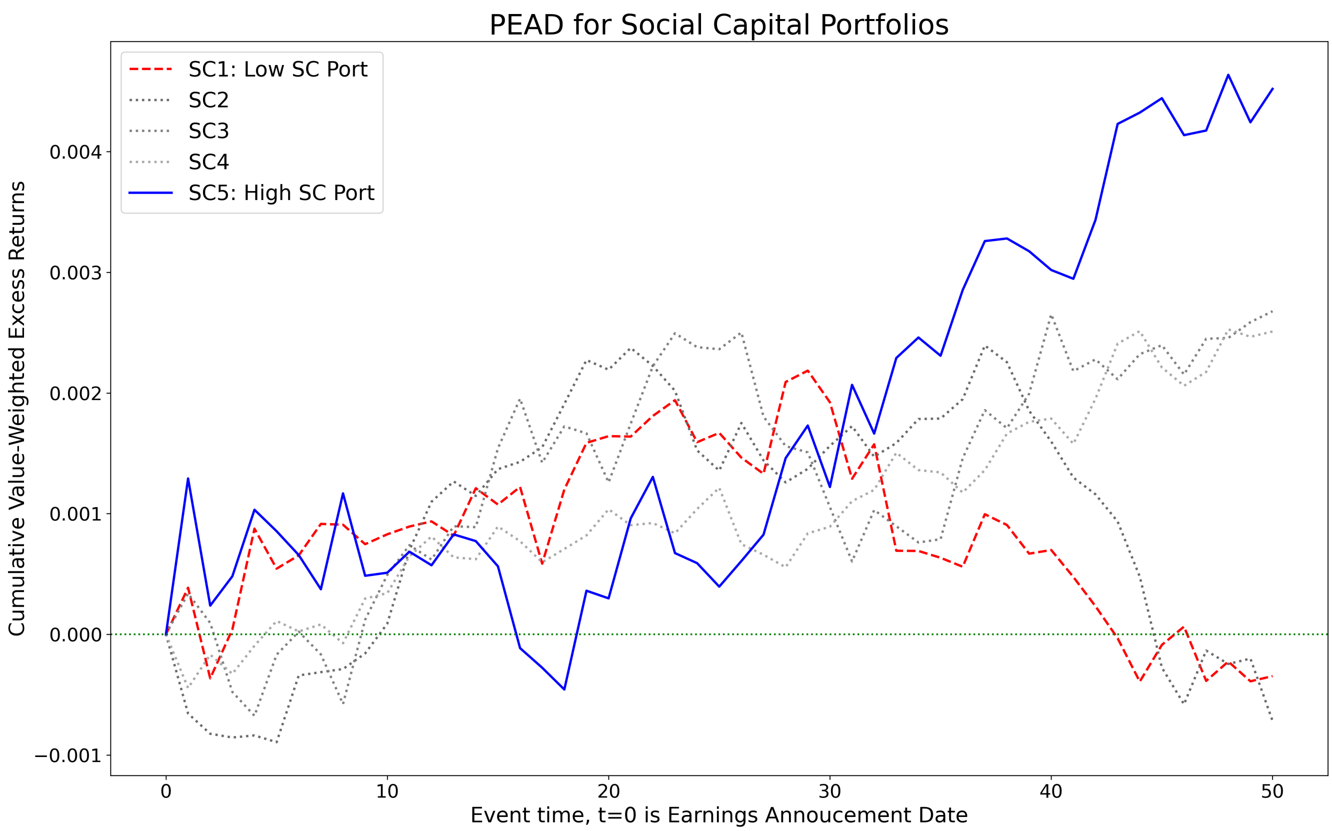


Fig. 6. PEAD by Social Capital. This figure plots the mean cumulative post-announcement excess returns by social capital. We form five quintile portfolios each year based on the prior fiscal year's social capital measures. Then we compute cumulative post-earnings announcement excess returns for 50 trading days after each announcement day. We average these returns within each quintile groups across our sample period from July 1994 to June 2021.

Table 1: Summary Statistics

This table reports summary statistics of social capital and other firm characteristics across our pooled sample from July 1994 to June 2021. Firm-level social capital is defined as the sum of the weighted number of times a firm mentions each congruous state in its 10-K multiplied by the state-level social capital. Denote state-level social capital measure as $SocialCap_j$ as in Putnam (1995), where $j \in [1, 2, ..., 49]$ represents the 49 contiguous states of the US. Denote firm i's number of times mentioning state j in year t as $n_{i,j,t}$. Then a firm's overall social capital exposure in year t is:

$$SocialCapital_{i,t} = \frac{\sum_j SocialCap_j \times n_{i,j,t}}{\sum_j n_{i,j,t}}$$

We follow Garcia and Norli (2012) to count the state names in "Item 1: Business", "Item 2: Properties", "Item 6: Consolidated Financial Data", and "Item 7: Management's Discussion and Analysis". Other firm characteristics include the natural log of market capitalization, the natural log of book-to-market ratio, asset growth, gross profitability, static social capital measure, corporate governance (Gompers et al., 2003), entrenchment index (Bebchuk et al., 2009), hostile takeover index (Cain et al., 2017), geographic diversity (Garcia and Norli, 2012), institutional ownership, and corporate social responsibility (Lins et al., 2017).

Variables	Mean	STD	1%	25%	50%	75%	99%
SocialCap	-0.15	0.32	-0.98	-0.32	-0.17	-0.01	0.94
log(MktCap)	6.07	2.11	1.66	4.53	5.98	7.48	11.23
B/M	-0.76	1.04	-3.58	-1.32	-0.71	-0.16	1.89
ATG	0.17	1.24	-0.47	-0.02	0.06	0.18	2.23
GP	0.34	0.32	-0.61	0.17	0.31	0.49	1.20
OldSocialCap	-0.50	0.85	-2.15	-1.14	-0.44	0.06	1.61
Governance	-9.07	2.53	-14.00	-11.00	-9.00	-7.00	-5.00
E-Index	2.45	1.29	0.00	2.00	2.50	3.00	5.00
H-Index	0.19	0.10	0.05	0.11	0.16	0.26	0.42
Geo-Div	8.61	8.63	0.00	3.00	6.00	11.00	46.00
IO	0.52	0.33	0.00	0.24	0.55	0.80	1.00
CSR	-0.05	0.47	-0.99	-0.33	0.00	0.12	1.62

Table 2: Correlations

This table computes pairwise correlations of the variables shown in the summary statistics. The variables include: social capital, the natural log of market capitalization, the natural log of book-to-market ratio, asset growth, gross profitability, static social capital measure, corporate governance (Gompers et al., 2003), entrenchment index (Bebchuk et al., 2009), hostile takeover index (Cain et al., 2017), geographic diversity (Garcia and Norli, 2012), institutional ownership, and corporate social responsibility (Lins et al., 2017). We omit the upper triangle and use shorter abbreviations in the first row for variables to aid visibility.

	SC	log(MC)	log(B/M)	ATG	GP	OldSC	Gov	E-Idx	H-Idx	Geo-D	IO
log(MktCap)	0.00										
log(B/M)	-0.07	-0.58									
ATG	0.03	0.12	-0.11								
GP	0.12	0.00	-0.30	-0.05							
OldSocialCap	0.33	-0.03	-0.03	-0.01	0.11						
Governance	0.01	0.00	-0.05	0.04	0.01	-0.18					
E-Index	-0.01	-0.16	0.12	-0.04	-0.04	0.13	-0.71				
H-Index	-0.04	0.28	-0.03	-0.08	-0.04	0.08	-0.22	0.01			
Geo-Div	-0.02	0.07	0.06	0.02	0.04	0.07	-0.04	0.04	-0.03		
IO	0.02	-0.05	0.00	0.05	-0.10	-0.09	-0.03	0.13	-0.13	0.05	
CSR	0.10	0.21	-0.20	-0.03	0.21	0.09	-0.09	0.02	0.05	-0.08	-0.11

Table 3: Social Capital and Firm Characteristics
This table present results from regressing social capital on contemporaneous firm characteristics and governance indices. In Column (1), we include the following firm characteristics: the natural log of market capitalization, the natural log of book-to-market ratio, gross profitability, and asset growth. From Column (2) to Column (7), we sequentially add geographic diversity (Garcia and Norli, 2012), corporate governance (Gompers et al., 2003), entrenchment index (Bebchuk et al., 2009), hostile takeover index (Cain et al., 2017), corporate social responsibility (Lins et al., 2017), and static social capital (OldSocialCap). The sample period is from 1994 to 2021, subject to the availability of the governance indices data. We cluster standard errors by firm and year.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARS			Dependent Variable: SocialCap				
log(MCap)	-0.008***	-0.007***	-0.008*	-0.008*	-0.008	-0.013***	-0.011***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)	(0.002)
B/M	-0.024***	-0.023***	-0.020**	-0.014*	-0.016**	-0.016***	-0.025***
	(0.003)	(0.003)	(0.007)	(0.007)	(0.007)	(0.006)	(0.004)
GP	0.003	0.006	0.044	0.043	0.084***	0.028	-0.007
	(0.012)	(0.012)	(0.025)	(0.030)	(0.027)	(0.021)	(0.012)
ATG	0.006	0.006	0.027***	0.008	0.015	0.025**	0.011*
	(0.006)	(0.006)	(0.007)	(0.011)	(0.010)	(0.009)	(0.006)
Geo-Div		-0.001**					
		(0.000)					
Govern			-0.004*				
			(0.002)				
E-Index				0.008			
				(0.005)			
H-Index					0.101		
					(0.074)		
CSR						0.043***	
						(0.011)	
OldSCap							0.119***
							(0.006)
Obs	60,578	60,578	13,450	18,580	16,691	21,080	50,961
R-squared	0.005	0.006	0.007	0.005	0.009	0.009	0.104

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Portfolio Analyses

This table provides various portfolio analyses for the universe of stocks sorted on our firm-level social capital measure. At the end of each June from 1994 to 2021, we sort stocks into three tercile portfolios, four quartile portfolios, five quintile portfolios, and ten decile portfolios according to the social capital measure. These portfolios are held until the end of June in year $t+1$ and then rebalanced based on the updated social capital measure when new information is available. We create zero-cost hedge portfolios that buy high social-capital stocks and short low social-capital stocks. In Panel A, we compute the monthly value- and equal-weighted alphas on the hedge portfolios using Fama-French five-factor model (FF5) and FF5 augmented with a momentum factor (FF6). The left half panel reports value-weighted results, while the right half panel reports equal-weighted results. In Panel B, we first divide the universe of stocks into two equal-sized subsets based on size, book-to-market ratio (B/M), gross profitability (GP), asset growth (ATG), momentum (MOM), idiosyncratic risk (IdioRisk), illiquidity (Illiq), and institutional ownership (IO). Then we repeat the exercise of calculating value-weighted high-minus-low portfolio alphas from five quintile portfolios formed from the two subsets for each characteristic. Standard errors are Newey-West standard errors with 6 lags and are included in parentheses.

Panel A: Portfolio Alphas

	Value-Weighted				Equal-Weighted			
	Tercile	Quartile	Quintile	Decile	Tercile	Quartile	Quintile	Decile
FF5	0.339***	0.461***	0.540***	0.600***	0.233***	0.252***	0.277***	0.263**
	(0.109)	(0.136)	(0.153)	(0.169)	(0.076)	(0.089)	(0.091)	(0.108)
FF6	0.323***	0.444***	0.534***	0.563***	0.261***	0.277***	0.298***	0.257**
	(0.107)	(0.134)	(0.151)	(0.173)	(0.077)	(0.090)	(0.092)	(0.105)

Panel B: Portfolio Alphas by Characteristics

	Size	B/M	GP	ATG	MOM	IdioRisk	Illiq	IO
Low	0.381***	0.533***	0.261*	0.324**	0.412**	0.394***	0.475***	0.413**
	(0.124)	(0.159)	(0.157)	(0.130)	(0.177)	(0.142)	(0.147)	(0.206)
High	0.475***	0.224	0.659***	0.623***	0.575***	0.610***	0.236*	0.383***
	(0.141)	(0.204)	(0.171)	(0.192)	(0.155)	(0.233)	(0.128)	(0.141)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5: Fama-MacBeth Cross-sectional Regressions

This table reports Fama-MacBeth cross-sectional regressions of returns on social capital and other firm characteristics. Each month, we run cross-sectional regressions of stock returns on firm characteristics, and then we average the coefficients across the time series. The sample runs from July 1994 to June 2018 since our lagged social capital measure is between July 1994 to June 2021. Control variables include the natural log of market capitalization, the book-to-market ratio, gross profitability, asset growth, momentum, short-term reversal, idiosyncratic risk (Ang et al., 2006), and illiquidity (Amihud, 2002). Column (2) adds geo-diversity (Garcia and Norli, 2012). Column (3) adds Entrenchment Index (Bebchuk et al., 2009). Column (4) adds Takeover Index (Cain et al., 2017). Column (5) adds the CSR measure (Lins et al., 2017). Column (6) regresses Fama-French 48-industry adjusted returns (Fama and French, 1997) on social capital and other firm characteristics to control for industry effects. Column (7) removes our social capital measure and replaces it with the static social capital measure used in prior literature (Old SocialCap).

	Dependent Variable: Returns					FF48-Exret	Ret
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SocialCap	0.225***	0.221***	0.262**	0.361***	0.262**	0.167**	
	(0.084)	(0.084)	(0.108)	(0.127)	(0.125)	(0.071)	
Geo_Div		-0.008*					
		(0.004)					
E-Index			-0.029				
			(0.027)				
H-Index				-1.211***			
				(0.407)			
CSR					0.085		
					(0.088)		
OldSocalCap							0.023
							(0.033)
Controls	YES	YES	YES	YES	YES	YES	YES
Observations	715,703	715,703	221,133	198,723	247,505	715,703	650,994
R-squared	0.055	0.056	0.089	0.090	0.086	0.045	0.057

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6: Social Capital and Earnings Surprises

This table presents results from regressing monthly stock returns on social capital and firm characteristics while adding SUE as an additional control. Firm characteristics include the natural log of market capitalization, the natural log of book-to-market ratio, gross profitability, asset growth, momentum, idiosyncratic risk, and illiquidity. SUE is defined as:

$$SUE_{j,t} = \frac{EPS_{j,t} - MedForecast_{j,t}}{P_{j,t}}$$

We use three measures of SUE as defined in Livnat and Mendenhall (2006): (1) the actual value is extracted from Compustat, and the expected value is the prior year's actual value extracted from Compustat; (2) the same as (1) except that the actual values are adjusted by subtracting special items scaled by 0.65; (3) both the actual value and expected value are extracted from IBES. Columns (1) and (2) use SUE1, where Column (1) uses a subsample where $SUE1 \neq 0$ and Column (2) uses the subsample where $SUE1 = 0$. Columns (3) and (4) use SUE2, where Column (3) uses a subsample where $SUE2 \neq 0$ and Column (4) uses the subsample where $SUE2 = 0$. Columns (5) and (6) use SUE3, where Column (5) uses a subsample where $SUE3 \neq 0$ and Column (6) uses the subsample where $SUE3 = 0$. The sample period is from 1994 to 2021.

	Dependent Variable: Returns					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	SUE1!=0	SUE1=0	SUE2!=0	SUE2=0	SUE3!=0	SUE3=0
SocialCap	0.056	0.182**	0.113	0.174*	-0.130	0.201**
	(0.238)	(0.088)	(0.231)	(0.089)	(0.207)	(0.089)
SUE1	2.582***					
	(0.261)					
SUE2			3.961***			
			(0.724)			
SUE3					17.522***	
					(1.749)	
Controls	YES	YES	YES	YES	YES	YES
Observations	155,460	560,243	157,729	557,974	142,911	572,792
R-squared	0.133	0.054	0.137	0.054	0.182	0.054

Note: *p<0.1; **p<0.05; ***p<0.01

Table 7: Portfolio Analyses for Alternative Social Capital Measure

This table provides various portfolio analyses for the universe of stocks sorted on the alternative firm-level social capital measure computed based on Chetty et al. (2022a,b). At the end of each June from 1994 to 2021, we sort stocks into three tercile portfolios, four quartile portfolios, five quintile portfolios, and ten decile portfolios according to the social capital measure. These portfolios are held until the end of June in year $t+1$ and then rebalanced based on the updated social capital measure when new information is available. We create zero-cost hedge portfolios that buy high social-capital stocks and short low social-capital stocks. We compute the monthly value- and equal-weighted alphas on the hedge portfolios using the Fama-French five-factor model (FF5) and FF5 augmented with a momentum factor (FF6). The left half panel reports value-weighted results, while the right half panel reports equal-weighted results. Standard errors are Newey-West standard errors with 6 lags and are included in parentheses.

	Value-Weighted				Equal-Weighted			
	Tercile	Quartile	Quintile	Decile	Tercile	Quartile	Quintile	Decile
FF5	0.130	0.137	0.199*	0.127	0.166***	0.153**	0.140*	0.158*
	(0.079)	(0.098)	(0.112)	(0.155)	(0.056)	(0.062)	(0.076)	(0.086)
FF6	0.119	0.129	0.186*	0.084	0.140***	0.122**	0.105	0.112
	(0.074)	(0.093)	(0.107)	(0.150)	(0.051)	(0.055)	(0.067)	(0.087)

Note: *p<0.1; **p<0.05; ***p<0.01

Appendix A. Selected Variable Definitions

$AssetGrowth$	= total asset growth over the previous year
$Book\,Value\,of\,Equity$	= $SEQ + TXDITC - Perferred$, preferred is $PSTKRV$, or $PSTKL$, or $PSTK$, whichever is first available.
GP	= gross profitability, equals $(REVT - COGS)/AT$
$Illiquidity$	= monthly mean of daily absolute return over price times volume of that day, see Amihud (2002).
$Social\,Capital$	= $\frac{\sum_j SocialCap_j \times n_{i,j,t}}{\sum_j n_{i,j,t}}$, a weighted average measure of state-level social capital, where the weights are each firm's number of times mentioning each US state

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