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Local Happiness and Firm Behavior: Do Firms in Happy Places Invest More?

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Abstract

We examine a previously unexplored relationship between local happiness and firm investment. We looked at investment in general and R&D intensity in particular, as the relatively intangible nature of the latter may make it more subject to the effects of sentiment and affect. We find that average local happiness is positively correlated with both R&D intensity and firm investment, after controlling for firm and local area characteristics. This positive relationship may be due to the optimism and longer term perspectives that are typically associated with higher levels of life satisfaction/happiness. We also look at inequality in happiness levels and find that the effect of local happiness is stronger in places with more equal happiness distributions. Younger firms' investment behavior is also more strongly correlated with local happiness levels. The results remain robust to a battery of robustness tests including the use of residual and hedonic measures of happiness, analysis of a sample of relocated firms, and a test for reverse causality.

Keywords: happiness; subjective well-being; sentiment; location; R&D; investment
JEL classification: G02; G31; I31; D69

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Highlights

- Local happiness is correlated with higher levels of firm investment in general and R&D in particular after controlling for firm and local area characteristics
- The role of local happiness is greater in places where happiness is more equally distributed
- The results are more important for R&D investment and for younger firms
- The results are robust to a number of alternative specifications such as the inclusion of residual happiness levels which are not explained by the standard correlates, the use of hedonic rather than evaluative well-being measures, examining a sample of relocated firms, and testing for reverse causality.

1. Introduction

The traditional paradigm in finance and economics has long assumed that economic agents are rational and maximize their self-interest by making unbiased decisions independent of the effects of non-monetary factors such as mood and sentiment. However, substantial evidence shows that sentiment and affect indeed influence economic behavior (Ifcher and Zarghamee, 2011; Puri and Robinson, 2007; Kuhnen and Knutson, 2011). As mood and affect as well as well-being more generally are known to influence decision making, the emotional state of company decision makers may have an impact on firm policies. In the corporate finance setting, it has been documented that certain biases and characteristics of managers such as optimism and overconfidence influence firm outcomes (Graham et al., 2013; Malmendier and Tate, 2005, 2008; Hackbarth, 2008). However, the effects of managerial subjective well-being and local level well-being more generally on firm behavior have not been examined.

Happiness and the more over-arching concept of subjective well-being have attracted significant attention in recent years, and happiness economics has developed into a burgeoning field. The emergent literature has identified certain determinants and externalities of happiness that are found to be remarkably consistent across communities and countries. For example, research shows that happier people are both healthier and more productive (Graham, 2009; De Neve and Oswald, 2012). Other research suggests that happier people tend to be more optimistic. Recently, a small number of these studies have started examining how happiness affects financial decision making at the individual level. For instance, Kaplanski et al. (2014) show that happy people expect higher returns. Since it is people who make decisions at firms and set corporate policies, findings from happiness economics can shed further light on firm behavior. However, whether happiness affects financial decision making at the firm level has not been studied.

In this paper, we explore whether there is any relationship between firms' decisions to invest in general – and to invest in research and development (R&D) in particular – and average levels of local happiness. We are not aware of any direct survey data that measure managerial happiness. However, people are subject to the effects of their environment and local culture since an individual's preference and decision making are often influenced by the actions of a reference group, which tends to be localized. In finance, studies that examine the effect of location on firm behavior are recently emerging. In these papers, location and distance often proxy for access to credit, information and monitoring cost, shock propagation, and transmission of corporate practices,[†] but only occasionally for non-economic local characteristics such as culture and religiosity.[‡] In this paper, we focus on the effect of a previously unexplored aspect of local culture—local happiness—on firm behavior.

Local happiness varies across the U.S. as shown by the persistent differences in self-reported subjective well-being in cities across the country (Glaeser, Gottlieb and Ziv, 2014). As an example, Figure 1 illustrates the average reported happiness of Metropolitan Statistical Areas included in our sample for 2013. We hypothesize that firms located in happier places are likely to invest more, especially in R&D, because happiness impacts risk tolerance, time preference, and expectations, and hence, the management of firms located in happier places may be more optimistic and more willing to think about the future. In addition, there seem to be positive externalities associated with higher levels of aggregate happiness, such as more trust, more sociability, and better public goods (discussed below), externalities which may play a role here.

We use data from the Gallup Daily Poll and merge it with firm accounting data and local area characteristics to explore if there are additional effects of local happiness on firm behavior.

[†] Examples of these studies include Loughran (2008), Arena and Dewally (2012), Tian (2011), Mian (2006), Saunders and Steffen (2011) and John, Knyazeva and Knyazeva (2011) among others.
[‡] Examples include Hilary and Hui (2009), Becker, Ivkovic, and Weisbenner (2011), and Jha and Chen (2013).

In short, we ask whether the positive externalities related to happiness at the societal and individual levels also relate to firm decisions. We also examine the effect of inequality in local happiness levels given the increased inequality of happiness in the U.S. and the emerging literature exploring this aspect of happiness.

Overall, we find support for our hypotheses. After controlling for firm and local area characteristics, we find that average local happiness is positively correlated with both R&D intensity and firm investment. We also find that greater inequality or dispersion in local happiness, as measured by the standard deviation of happiness within a local area, is negatively correlated with firm investment. This indicates that the effect of local culture and happiness is stronger in places where the residents are more uniformly happy instead of places with significant unhappy cohorts.

Potential endogeneity and reverse causality are a significant caveat to our results, and we check their robustness via a battery of robustness tests: using local residual happiness and hedonic measures of happiness, controlling for local population growth, examining a sample of relocated firms, and testing for reverse causality. These robustness tests show that average investment of local firms cannot predict future individual happiness of local residents and when firms move to happier places they tend to increase their capital expenditures. The main results based on R&D also remain qualitative the same with the use of hedonic measures of happiness.

There are some important nuances in our findings. Our findings on R&D are more economically significant than those on general investment in our baseline regression. This is consistent with R&D investments typically being more intangible with greater uncertainty compared to corporate capital expenditures and thus, more subject to the effects of sentiment and culture. Firm age also matters, with younger firms' investment behavior more strongly correlated

with local happiness levels. This could be because younger firms are more responsive to local environments and culture than older firms due to a less codified decision making process at younger firms.

Our paper is a first foray into this area of subjective well-being and firm behavior, and our findings suggest that firms in happier places invest more than those in less happy places or places with greater inequality in happiness. More research is necessary to better understand these linkages. That said, our results suggest that among other things, happiness may also be good for economic productivity. Consequently, our study is relevant to various streams of literature in finance including behavioral finance as well as the growing field of subjective well-being and the economic geography literature.

The remainder of the paper is organized as follows. Section 2 discusses the relevant literature and our hypotheses in further detail. After describing the data and the descriptive statistics in Section 3, we present the results of local happiness on firm investment in Section 4. Section 5 discusses robustness tests, and Section 6 concludes.

2. Prior literature and hypotheses development

There has been much recent research on happiness and subjective well-being more generally, both due to inherent interest in the topic and to the positive externalities associated with higher average levels of subjective well-being. These play out at the country levels, and places like Costa Rica, Denmark, Sweden, and Canada are not only among the happiest places in the world, but those rankings link to important objective measures such as better public goods, lower crime rates, higher trust, and good democracies, all of which are associated with higher levels of human well-being and economic development. At the individual level, meanwhile,

there is two-way causality, as happier people are typically healthier and more productive than the average (Graham, 2009; De Neve and Oswald, 2012).

While happiness is the commonly used colloquial term, scholars of subjective well-being are careful to distinguish its distinct components. "Happiness" as measured by survey questions about life satisfaction and the best life possible is an evaluative dimension of subjective well-being which assesses peoples' views of their lives as a whole. This dimension correlates with people's agency, capacity, choice, and meaning and purpose in life. It is also typically more closely correlated with income than other well-being dimensions, as people with more income have more choice over the kinds of lives that they choose to lead, and thus the ability to plan for and invest in those futures (Graham and Nikolova, 2015). Optimism, sentiment, and positive or negative affect, on the other hand, are distinct and measured by questions about respondents' mood – such as happy, smiling, or stressed *at the moment*. These metrics assess the hedonic dimension of well-being and reflect innate character traits and their relation to daily experiences (Stone and Mackie, 2013).

Many argue that decision making and affect are linked and hence, happiness can influence various outcomes. For example, previous research shows that happy people are more optimistic. Ifcher and Zarghamee (2011) argue that positive mood reduces time preference over money and makes people more willing to think about the future. These findings are supported by the theoretical work of Benabou and Tirole (2003), which suggests that the driving channel between optimism and productivity is intrinsic motivation. Oswald, Proto, and Sgroi (forthcoming), based on experimental data, show that positive affect induced by video-clips resulted in subjects putting forth a greater quantity of output, while bad moods induced by bereavement or illness in the subjects' families had a negative effect on productivity.

How financial decisions are made either at individual or firm level is a question of great economic significance. Thus, a small number of studies have started looking at the role of happiness and positive mood in financial decision making at the individual level. Kuhnen and Knutson (2011) show that positive emotional states induce people to take more risks and to become more confident of their ability to evaluate investment options and vice versa. Similarly, Grable and Roszkowski (2008) find that those in a happy mood at the time of a survey have higher financial risk tolerance. Kaplanski et al. (2014) show that affect influences risk and return expectations: Happy people expect higher returns. In a related study, Puri and Robinson (2007) focus on optimism and document that it affects various life choices such as investing more in stocks and saving more.

In the corporate finance setting, previous research has shown that certain manager characteristics, biases, and optimism affect firm outcomes. For example, studies show that optimistic managers use higher levels of debt. Specifically, Graham et al. (2013) use psychometric testing surveys and show that U.S. CEOs are more optimistic than non-U.S. CEOs which has significant consequences for corporate financing policies. In a series of papers, Malmendier and Tate (2005, 2008) and Malmendier, Tate, and Yan (2011) study overconfidence of CEOs and its effect on various corporate policies. Overconfidence, religiosity, political affiliation, entrepreneurship status, age, and military background of managers have been studied in this context (Landier and Thesmar, 2009; Hutton, Jiang, and Kumar, 2013; Hackbarth, 2008). Since emotional state influences financial decision making, subjective well-being of decision makers of a company may affect firm investment policies. More optimism due to higher subjective well-being may induce firms to invest more. However, whether happy managers do anything differently has not been studied despite the growing interest in happiness economics.

We focus on the level of subjective well-being – in this case local average happiness – and examine whether local happiness affects firm behavior, specifically corporate investment. An individual's preference or decision making is influenced by the actions of a reference group, which tends to be localized. Thus, local culture matters because people and firms are affected by their environment. Some examples of such social influence have been documented. For example, Hong, Kubik, and Stein (2004) find that social people participate more in the stock market. Hilary and Hui (2009) show that firm culture as measured by county religiosity impacts risk exposure. Kedia and Rajgopal (2009) find that a firm's social interaction with its neighboring firms affects option grants. The role of peer effects in corporate practices has been studied in other contexts (Davis and Greve, 1997; Gao, Ng and Wang, 2011). Moreover, the effect of local culture on firm behavior has been extended to the country level in several studies. Chui, Lloyd, and Kwok (2002) explore how national culture affects capital structure. They document lower debt ratios in cultures with high conservatism across 22 countries. Breuer, Rieger, and Soypak (2014) show that cultural traits affect payout policy, and Eun, Wang, and Xiao (2015) show that culture also affects stock price co-movement.

There have been a very few studies of the relation between average local happiness levels and individual behavior. Daly, Oswald, Wilson, and Wu (2011), for example, examine how suicide rates vary depending on average happiness levels across states in the U.S. and find that suicide rates are actually higher in happier states. It is likely that it is more difficult to be unhappy or depressed in a place where most people are generally happy.

We hypothesize that firms located in happier places are more likely to invest, especially in R&D, given the optimism, higher risk tolerance, and longer-term thinking associated with both dimensions of subjective well-being. R&D expenditure is a type of investment decision, but

it differs significantly from other long-term investments such as capital expenditure. R&D is often directed towards the development of a new technology or a product, has a significant intangible component, and involves greater uncertainty with the success of R&D projects determined over extended periods. Thus, compared to more tangible capital expenditures, the decision to invest in R&D may be more prone to managerial sentiment and happiness. In a related theoretical work, Giat, Hackman, and Subramanian (2010) suggest that managerial optimism can be a significant driver of R&D project values.

In addition to average local happiness, we also consider inequality of happiness given the recent emerging literature exploring this aspect of happiness. Places where inequality in well-being is high, meanwhile, typically have more poor and unhappy people at the bottom of the distribution. In the U.S., inequality of happiness has increased in recent years with the standard deviation of happiness scores increasing in the U.S. (roughly since 2000), in contrast to many other OECD countries (Clark et al., 2014). Meanwhile, happiness inequality fell during the same period in Latin America and the Caribbean, where growth and poverty reduction has been steady (Helliwell and Wang, 2013). We thus account for dispersion in local happiness, and we expect to observe the effect of local happiness on firm behavior especially in such areas with more uniform happiness distribution.

When one explores the relationship between firm investment and local happiness, endogeneity and reverse causality are potential issues. For example, individual happiness has been shown to have standard determinants such as income, marital status, health, age and gender. Some of these determinants can be impacted by local economic environment, which can also dictate the behavior of local firms. However, previous literature argues that many non-economic factors affect happiness and subjective well-being (Graham, 2009; Helliwell, Layard, and Sachs,

2013). Thus, local happiness is determined not only by the local economic environment but is also a part of local culture. Attempts have been made previously to indeed capture such local culture and endogenous local effects. Dougal, Parsons, and Titman (2015), for example, call this endogenous local effect "urban vibrancy." Richard Florida (2002) writes about the same phenomenon as "the creative class" in vibrant cities. We elaborate on these concerns of endogeneity and reverse causality in detail and control for them in Section 5. In short, we believe that it is local happiness, which may also capture the well-being of managers, driving firm investment behavior.

Moreover, although some firms maintain geographically diverse operations, we believe investment decisions are made by upper management who are typically located at firm headquarters and thus exposed to local happiness levels and their externalities. The effect of local happiness may also be stronger in certain circumstances such as in the case of younger firms with a less codified decision making process and more managerial autonomy, and thus, are more prone to managerial affect and sentiment.

3. Data

We use several databases to construct our sample. We obtain our well-being data from the Gallup Daily Poll, which provides daily household-level data on individual perceptions from 2008 to 2013. This dataset is a stratified sample of an average of 1,000 households surveyed daily across the United States for all localities with landline phones and mobile cellphone connections. It has over 1.9 million individual observations over the period of 2008-2013; we use about 1.3 million observations from 236 Metropolitan Statistical Areas (MSA) that appear in our final sample. The questions in the survey include personal health, emotional experiences,

emotional conditions, and geographic location in addition to other variables such as the demographic details and the economic conditions of the respondents. The Gallup Daily Poll is cross-section rather than panel and covers a different representative set of people each day rather than following the same people over time. Its large sample size across the U.S. provides a unique dataset with which to analyze the effects of local happiness on corporate policies.

We specifically focus on an evaluative measure of happiness and use the best possible life question from the Gallup Daily Poll, which is commonly used as a measure of life satisfaction/evaluative well-being (Graham et al., 2009; Kahneman and Deaton, 2010; Deaton and Stone, 2013). The best possible life question in Gallup asks respondents to use an 11-point ladder (0–10) to compare their life to the best possible life they can imagine, and a number of scholars find that responses to this question track robustly with other indicators of well-being across a wide sample of countries (Graham, 2009; Sacks, Stevenson, and Wolfers, 2010; Helliwell, Layard, and Sachs, 2013).

As is noted above, this measure of happiness captures how people think about and assess their lives as a whole, which is distinct from hedonic metrics which capture the manner and moods in which individuals experience their daily lives. We use evaluative well-being because it better reflects people's capacities to make long-term choices on the one hand, and because it is more influenced by socio-economic and environmental factors than hedonic metrics are. In addition, the distribution of evaluative well-being has greater variability than those of hedonic measures, which are captured by questions with binary yes/no answers in the survey. Still, as a robustness check, we also use hedonic measures of happiness in Section 5. Table 1 provides the summary statistics of our data. The summary statistics of our individual happiness measure and variables that are commonly considered as determinants of individual happiness are presented in

Panel A of Table 1.

In order to study the effect of local happiness on corporate investment, we compute average annual happiness for MSAs using responses to the best possible life question and the geographical information of the respondents. On average, 355 responses were used to compute annual local happiness of a MSA. Figure 1 illustrates the average MSA happiness for 2013 as an example. As Figure 1 shows, average happiness varies across the U.S. even within a same state. The map contains white areas because some rural areas do not belong to any MSA and also happiness data is not collected from some MSAs. As shown in Panel B of Table 1, the average annual local happiness variable has a mean of 6.96 and a median of 7 on a scale of 0-10 with 0 corresponding to the worst possible and 10 to the best possible life in terms of how local residents view their well-being. We find MSAs with reported happiness as high as 8.04 and as low as 6.19.

In addition to average local happiness, we also consider inequality of happiness given the newly emerging literature exploring this aspect of happiness. Hence, we conduct a two-way sort, first by average MSA local happiness and then by standard deviation of happiness within MSAs, creating variation in standard deviation of happiness that is independent of average happiness. This two-way sort results in local happiness quartiles and local happiness inequality quartiles. Finally, we create highest local happiness dummy variable which equals to one when the average local happiness is in the highest quartile and the standard deviation in the lowest quartile. This dummy variable identifies MSAs with the highest levels of uniform local happiness and has a mean of 0.06 in Table 1 Panel B. Panel B also provides the summary statistics of residual local happiness variables, which are explained in further detail in Section 5.

We obtain different local characteristics such as population, per capita income, wage, and

employment data for MSAs from the Bureau of Economic Analysis (BEA) and the U.S. Census Bureau. These variables, especially population growth, have been used to proxy for local economic growth and opportunity by previous studies. For example, Hilary and Hui (2009) use various county-level demographic data such as education, gender, income, and population when studying the effect of local religiosity on risk aversion. Becker, Ivkovic, and Weisbenner (2011) use decline in the number of young residents whereas Dougal, Parsons, and Titman (2015) and Almazan et al. (2010) use MSA population and wage growth to control for local area attractiveness.

Panel B provides the descriptive statistics of the local area characteristics obtained from the BEA and Census Bureau. Local annual population growth has a mean of 0.84 percent and a median of 0.74 percent with the MSA surrounding Joplin, MO experiencing the largest decline of -1.27 percent in 2012[§] and the MSA surrounding Midland, TX experiencing the highest annual growth of 4.75 percent in 2013[**]. The MSAs in our sample have experienced an average annual wage growth of 1.93 percent and per capita income growth of 2.03 percent. The average per capita income is $40,085.89, and the average MSA population is 1.1 million people.

In addition, we obtain various accounting data from Compustat for all publicly traded firms headquartered in the U.S. We exclude firms in the financial services and regulated utilities industries following the conventional approach in empirical research. Two main variables of interest to us are R&D intensity and investment. R&D intensity refers to the ratio of R&D expenditures to total assets, and firms with missing R&D information are assigned R&D values of zero in line with previous research (Hirschleifer, Low, and Teoh, 2012; Ciftci and Cready,

[§] Joplin, MO was hit by a powerful EF-5 tornado on May 22, 2011, which resulted in over hundred fifty deaths and almost thousand injuries.

[**] The MSA of Midland, TX has one of the lowest unemployment rates in the country at 2.3 percent as of November 2014.

2011). The conventional approach is to assume that firms with missing R&D have no material expenses to report and set missing R&D values to zero. Hirschey, Skiba, and Wintoki (2012) have examined 500 randomly selected firms with missing R&D to ascertain the validity of setting missing R&D to zero and found this approach to be valid.

We measure investment as capital expenditures normalized by property, plants, and equipment. Other control variables include firm size, Tobin's Q, return on assets (ROA), book leverage, and cash. Sale is used as a firm size measure. Tobin's Q refers to the ratio of market value of assets to book value assets. Market value of assets is defined as total assets plus market equity minus book equity. Market equity is computed by multiplying common shares outstanding by fiscal-year closing price. Book equity refers to stockholders' equity. ROA is computed as net income divided by total assets. Book leverage refers to debt in current liabilities plus long-term debt divided by total assets. Cash refers to the ratio of cash holdings to total assets. These accounting variables are winsorized at 5 and 95 percentiles to remove the effect of outliers. We also utilize firm age to identify subsamples of younger and older firms. Firm age refers to the number of years since the stock was included in the Compustat database.

In Panel C of Table 1, the firm characteristics are presented. R&D intensity has a mean of 0.08 and a median of 0.001 with many firms having no significant R&D expenditures. Investment as expressed as capital expenditures normalized by property, plants, and equipment has a mean of 0.116 and a median of 0.083. Firms also have average sales of 1.3 billion dollars. Tobin's Q is defined as the ratio of market value of assets to book value assets and has a mean of 3.42. Book leverage and ROA have a mean of 0.30 and -0.32, respectively. The average for cash holdings is 0.19, and the median firm age, which is used to divide firms into young and old firms, is 15 years.

We identify the corresponding MSA of each firm using the zip code of firm headquarter location and merge with local happiness and local area characteristics data by MSA. As mentioned previously, although some firms can have geographically diverse operations across multiple states and regions, we believe the upper management located at the firm's headquarter is mostly responsible for firm investment decisions. We exclude firms with missing zip codes or those located in non-MSA areas.

We also adjust for different fiscal year-end months. About 70 percent of the firms in the sample have fiscal years ending in the month of December, but others have fiscal years ending at different times of the year. Thus, we compute annual average happiness for MSAs ending in different months of the year and utilize the local happiness over the 12 months prior to the firm's fiscal year-end. Consequently, our final sample from 2008 to 2013 has over 24,000 firm-year observations and includes 5,682 unique firms located in 236 MSAs across the U.S.

Finally, we construct a sample of firm relocations to conduct an additional robustness check. Using S&P Capital IQ database, we identify announcements of corporate headquarter address changes involving public firms during 2008-2012. We exclude moves that take place within the same MSAs and also those due to corporate mergers and acquisitions, which results in 47 cases of headquarter relocations in our sample with available data.

4. Main Results

Table 2 presents our results of R&D intensity and local happiness. We are particularly interested in R&D and believe it is more susceptible to the effects of local happiness since R&D investment has a large intangible component and involves greater uncertainty. R&D often involves the development of a new technology or a product and differs from other long-term

capital expenditures. Thus, compared to more tangible capital expenditures, the decision to invest in R&D may be more prone to managerial sentiment and happiness, which in turn is influenced by local happiness. We estimate a regression on R&D intensity using local happiness variables along with standard control variables. All the regressions include year and industry fixed effects, where industry is defined by two-digit SIC code. We also include state fixed effects to control for differences in the legal and economic environments across states. In addition, standard errors are clustered by MSA.

The results in Model 1 show that local happiness has a positive and significant association with R&D investment after controlling for other firm characteristics and the various fixed effects. This suggests that firms located in happy places tend to invest more in R&D. In terms of economic significance, one standard deviation increase in local happiness is associated with a 0.012 increase in R&D intensity. The mean and median R&D intensity in our sample are 0.08 and 0.001 with many firms with zero R&D investment.

In Model 2, we account for dispersion of happiness within MSAs in addition to average MSA happiness using double-sorted quartiles and find that the happiness quartile has a significant positive association with R&D investment whereas the inequality quartile has a significant negative relation. Thus, greater inequality in happiness in an area is negatively correlated with R&D investments of firms located in the area. The highest uniform local happiness dummy in Model 3 confirms this result. This dummy variable equals to one if a firm is headquartered in a location that falls in the highest happiness and the lowest happiness inequality quartile. The results on control variables are also in line with previous findings. We find that higher R&D expenditures are associated with smaller firms and firms with higher Tobin's Q, poorer operating performance, lower book leverage, and higher cash holdings. Hirschleifer, Low,

and Teoh (2012) also document similar results.

Moreover, it is possible that the effect of local affect is greater for younger firms with a less codified decision making process and greater managerial autonomy, and perhaps with younger managers who are more likely to be influenced by sentiment, affect, and the local environment. Therefore, in Models 4-9, we estimate the same R&D intensity regression on subsamples based on firm age and find that local happiness is significant in both subsamples. However, the estimated coefficients for younger firms in Models 4-5 in Table 2 are slightly larger than those for older firms in Models 7-8 consistent with the effect of happiness being greater for younger firms.

In Table 3, we focus on more tangible investment and estimate corporate investment as measured by capital expenditures normalized by property, plants, and equipment on local happiness. Higher local happiness is associated with higher capital expenditures in Model 1. The same effect of happiness inequality is found in Model 2 as well. More unequal the happiness within an area, less capital investment is observed among the firms located in the area. The highest local happiness dummy in Model 3 also confirms this finding as it identifies firms located in areas with not just high local happiness, but more evenly distributed local happiness. However, the economic significance of these results is negligible compared to those of R&D intensity. One standard deviation increase in local happiness is associated with an increase of 0.003 in investment based on the estimated coefficient in Model 1. Mean and median investment levels in our sample are 0.116 and 0.083, respectively.

When we divide the sample into subsamples based on firm age in Models 4-9 in Table 3, the results for younger firms in Models 4-5 are significant and have slightly larger coefficients than those based on the full sample. On the other hand, the estimated coefficients for older firms

in Models 7-9 are not significant providing some support for our conjecture that the effect of local happiness may be greater for younger firms. These results are also in contrast to the findings on R&D intensity, which was significant in both subsamples. This is again consistent with R&D being more subject to sentiment and culture compared to more traditional capital expenditures.

As for control variables, we find that larger firms and those with higher Tobin's Q, higher ROA, and more cash tend to invest more in line with previous research (e.g., Malmendier and Tate, 2005). Cash rich firms are, for example, more able to invest. Book leverage, on the other hand, has a negative effect on investment as debt has constraints.

Overall, the above results indicate that the effect of local happiness (happiness inequality) is consistent with our predictions: it is positive (negative) for corporate investment, especially in R&D. Firms located in happier places with more even happiness distribution are associated with higher R&D intensity and corporate investment, which suggests that decision makers at firms are affected by the level of local subjective well-being and the related expectations.

5. Robustness tests

Having established a link between local happiness and firm behavior, we check the robustness of our results by using alternative specifications. Potential endogeneity and reverse causality are a significant caveat to our results, and we first check the robustness of our results by utilizing residual local happiness. The prior literature in subjective well-being and happiness economics has identified certain determinants of happiness that are found to be remarkably consistent across communities and countries. These socio-economic and demographic determinants may, indeed, be affected by local economic conditions that can also impact firm

behavior. Therefore, in Table 4, we regress individual happiness on age, employment status, health, marital status, education, and gender that are shown to affect individual happiness and obtain residual happiness. The regression also includes year fixed effects, and standard errors are clustered by MSA. This residual measure attempts to capture the components of happiness that are not determined by observable factors that might be shared across individuals in the same locale (for an example of prior use of this method in panel data, see Graham, Eggers, and Sukhtankar 2004)).

The results, in Table 4, are not surprising. Employment status was significant for happiness, and the coefficients on *Age* and Age^2 variables show the classic U-shaped age curve that is commonly documented in many prior studies (Graham, 2009). Those who reported being healthier, married, and educated had higher levels of happiness as health is essential to well-being, and stable partnerships, stable marriages, and social relationships also play a role in individual happiness. The coefficient on female was positive, which is consistent with prior research that shows women are typically happier than men, except in contexts where their rights are severely compromised (Graham and Chattopadhyay, 2013). We obtain residual happiness from this regression, which captures the unexplained portion of happiness that is not driven by the standard determinants that we have utilized.

Using the individual level residual happiness, we compute average local residual happiness for MSAs similar to our original local happiness measures. In addition to average local residual happiness, we also consider inequality in local residual happiness by conducting a two-way sort by mean local residual happiness and standard deviation of local residual happiness and producing local residual happiness and local residual happiness inequality quartiles. Finally, the highest local residual happiness dummy variable identifies MSAs with the highest levels of

uniform local residual happiness. The summary statistics of these residual happiness measures are provided in Panel B of Table 1.

In Tables 5 and 6, we re-estimate our R&D and tangible investment regressions using these local residual happiness measures. The estimated coefficients on R&D from Table 5 show that the results on highest uniform happiness and happiness inequality remain the same with the residual happiness variables. The results on tangible corporate investment in the form of capital expenditures in Table 6, on the other hand, became stronger with local residual happiness measures compared to those with the original local happiness measures in Table 4. However, the results are still primarily driven by younger firms rather than older firms. Overall, the results with both residual and regular local happiness measures suggest that there is a positive (negative) effect of local happiness (happiness inequality).

Next, we try to alleviate some endogeneity concerns with additional controls for local areas. As mentioned before, it is possible that certain local characteristics cause local firms to invest more and make local residents happy at the same time. Variables such as population, per capita income, wage, and employment have been used to proxy for local economic growth and opportunity by previous studies. For example, Hilary and Hui (2009) use various county-level demographic data such as education, gender, income, and population when studying the effect of local religiosity on risk aversion. Particularly, population growth is a commonly used all-around proxy for local environment. Previously, other studies such as Becker, Ivkovic, and Weisbenner (2011), Dougal, Parsons, and Titman (2015), and Almazan et al. (2010) have used population growth to control for local area attractiveness.

We, thus, utilize MSA population growth to proxy for local environment. The correlation between population growth and local happiness is 0.23 in our sample. In Table 7, we re-estimate

regressions in Tables 2 and 3 for the full sample, but with the inclusion of local population growth instead of state fixed effects to control for MSA characteristics. The results show that local population growth has a positive and significant coefficient indicating that firms headquartered in areas that have attracted population inflow invest more in R&D as expected. However, after controlling for this and other firm control variables, local happiness is still positive and significant. The results of investment regression estimated with local population growth also show similar results. Local population growth has a positive and significant association with investment, but local happiness remains positive and significant after controlling for this local area characteristic. In unreported analysis[††], we replace local population growth with other local area variables such as local per capita income and wage growth and find similar results. Therefore, our results are not driven by the local area attractiveness as proxied by characteristics such as population growth.

Next, we tackle the issue of reverse causality. Some may argue that the issue of reverse causality can be present here: Local firms investing more can make local residents happier. However, it should be noted that local firms investing more means R&D and capital expenditures of these firms are increasing, but does not necessarily mean that these local firms are investing locally. Nevertheless, to examine whether reverse causality is a potential issue in our study, we estimate the effect of local firms' average investment in time period *t* on the reported individual happiness of local residents in time period *t+1* in Table 8. We first compute average local R&D intensity and corporate investment of local firms by MSA. We also estimate regressions on R&D intensity and corporate investment using the firm level standard control variables in Tables 2 and 3 and obtain residuals. We then compute average local residual R&D intensity and corporate investment by MSA. We use these local average and local average

[††] Results are available upon request from the authors.

residual investment variables as explanatory variables of individual happiness along with the standard determinants of individual happiness in Table 8. As the results show, all the estimated coefficients on local investment in Table 8 are statistically not significant. Thus, there is no evidence to suggest that local average investment positively affects future happiness of the people in the area.

Another approach to address endogeneity is to study firms that relocated their headquarters. However, we find only a small number of relocations given the short time period of our study that spans 6 years between 2008 and 2013. Prior studies have found a small number of relocations in much longer samples. For example, Pirinsky and Wang (2006) found 118 relocations among 5,000 firms during 15 years. Dougal, Parsons, and Titman (2015) note that only 3.5 percent of firms in their sample moved headquarters at least once during the time period of 1970-2009. In order to compare investment behavior before and after relocation, we identify all cases of headquarter relocations from one MSA to another during 2008-2012 among all the public firms included in our sample. We pay close attention to the causes of relocations and exclude moves due to mergers and acquisitions etc. This results in a sample of 47 relocations.

In Table 9, we simply regress change in R&D intensity and investment on change in local happiness. Due to the small sample size and also because it takes time to absorb local culture and sentiment, we compute change as the difference between the average of years *t-1* and *t* and the average of years *t+1* and *t+2*. The idea is that when a firm relocates some time during year *t*, investment decisions for that year *t* most likely have already been made and any changes due to new location would be evident from year *t+1*. Thus, years *t-1* and *t* are used as pre-relocation and years *t+1* and *t+2* as post-relocation years. We use average of two years or data from only one year depending on data availability to ensure we do not lose too many observations from an

already small sample.

Results in Table 9 show that when a firm relocates to a place with higher local happiness, corporate investment increases as evidenced by the positive and significant estimated coefficients in Models 3 and 4. This lends support to our hypothesis that local happiness affects firm behavior. However, the estimated coefficients on changes in R&D intensity in Models 1 and 2 are not significant. It is possible that it takes time to change R&D policies due to the more long-term nature of these projects, or this lack of significance can simply be due to our small sample size.

Yet another additional robustness check we conducted is the use of hedonic measures of happiness.[‡‡] As noted above, hedonic well-being is typically measured with questions that gauge positive affect (smiling yesterday or happy yesterday, for example) and negative affect (anger or stress yesterday) separately. We use two questions from the Gallup Daily Poll that ask the respondents whether they experienced enjoyment or happiness yesterday as hedonic measures of happiness. These questions have a binary yes/no answer, and thus, average annual hedonic happiness for MSAs using these hedonic measures are effectively indicating the percentage of respondents who reported having experienced either enjoyment or happiness yesterday. Hence, compared to the best possible life question that uses an 11-point ladder (0–10), these variables have less variability. Moreover, psychologists emphasize that there is not a simple continuum running from the positive to negative dimensions with hedonic measures, as people can experience both at the same time such as happiness and stress (Diener (2012)). Still, the hedonics provide an alternative measure of happiness as a robustness check. As Table 10 shows, we find that higher hedonic measures of local happiness are associated with higher

[‡‡] The state of the science on these two dimensions is summed up in Diener (2012), Graham (2012), and Stone and Mackie (2013).

R&D intensity, but not with higher investment as measured by capital expenditures. This is consistent with our baseline regression results in Tables 2 and 3, where the results with R&D intensity were consistently significant and more than those with capital expenditure.

Finally, we utilize net investment intensity instead of investment normalized by capital in unreported regressions and find qualitatively similar results.[§§] Net investment intensity is capital expenditure plus increase in investments plus acquisitions minus sales of property, plant and equipment minus sales of investments, divided by lagged assets. To sum up, we cannot fully control for endogenous un-observables given the cross-section nature of our data. However, we believe local happiness indeed affects the investment behavior of local firms based on the results of the various robustness tests above.

6. Conclusions

Our research is an initial foray into an unexplored relationship: that between firm level investment decisions and the variance and distribution of local happiness levels. The burgeoning research on the economics of happiness has identified determinants and externalities of happiness that are remarkably consistent across communities and countries. We explore whether the externalities related to happiness at the societal and individual levels also relate to firm decisions using data from the Gallup Daily Poll in addition to firm accounting data and local area characteristics.

We find that average local happiness (happiness inequality) is positively (negatively) correlated with both R&D intensity and firm investment after controlling for firm and local area characteristics. Firms in happier places, especially those places with more equal happiness distributions, tend to invest more than those firms in less happy places.

[§§] Results are available upon request from the authors.

Our findings are robust to a number of controls and alternative specifications including the use of local residual happiness and hedonic measures of happiness, controlling for local population growth, examining a sample of relocated firms, and testing for reverse causality. We find that local average investment cannot predict future individual happiness of local residents thus contradicting the reverse causality argument. A small sample of firms that relocated their headquarters provide some support, albeit limited, that when firms move to happier places they tend to increase their capital expenditures. Use of hedonic measures also support our main results on R&D.

In addition, we find that firm age matters with younger firms' investment behavior more strongly correlated with local happiness levels. Younger firms may be more responsive to the make-up of the local population and to local affect and culture than older firms. Our findings on R&D are also more robust than are the general investment findings in our baseline regressions and also when we use average levels of hedonic happiness. R&D investments are typically more intangible – and thus riskier – than are regular corporate capital expenditures and may be more subject to the effects of sentiment and affect.

In short, our results suggest that happiness at the community level may indeed matter to corporate investment decisions, and among many other things, happiness may also be good for economic productivity. Hence, our study is relevant to various streams of literature in finance as well as to the growing study of subjective well-being and the literature on economic geography.

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Appendix
Variable Definitions

Variable	Definition
Individual level variables	
Happiness	Response to the best possible life question in Gallup, which asks respondents to use an 11-point ladder (0–10) to compare their life to the best possible life they can imagine.
Age	Respondent's age
Employed	Dummy variable that indicates the respondent's employment status.
Health	Respondent's assessment of one's own health on the scale of 0-5.
Married	Dummy variable that equals to one if the respondent is married.
Education	Highest level of education achieved on the scale of 1-6.
Female	Dummy variable that equals to one if the respondent is female.
Local happiness variables	
Evaluative measures	
Local happiness	Average annual happiness of a MSA computed using the responses to the best possible life question from the Gallup Daily Poll of those respondents located within the MSA.
Local residual happiness	Residual from a regression where individual happiness is regressed on various socio-economic and demographic determinant of happiness and year fixed effects.
Local (residual) happiness quartile	MSAs are first sorted annually by average (residual) local happiness and assigned into quartiles.
Local (residual) happiness inequality quartile	MSAs are sorted annually by local (residual) happiness quartiles and then by standard deviation of local (residual) happiness within local (residual) happiness quartiles resulting in a two-way sort.
Highest (residual) local happiness dummy	It identifies MSAs with the highest levels of uniform local (residual) happiness and equals to one when local (residual) happiness is in the highest quartile and local (residual) happiness inequality is in the lowest quartile.
Hedonic measures	
Enjoy yesterday	Percent of respondents of a MSA surveyed during a year who reported having experienced enjoyment yesterday.
Happy yesterday	Percent of respondents of a MSA surveyed during a year who reported having experienced happiness yesterday.
Firm characteristics	
R&D intensity	Ratio of R&D expenditures to total assets, and firms with missing R&D information are assigned a R&D value of zero.
Investment	Capital expenditures normalized by property, plants, and equipment.
Sales ($ millions)	Annual sales in millions of USD.
Tobin's Q	Ratio of market value of assets to book value assets. Market value of assets is defined as total assets plus market equity minus book equity. Market equity is computed by multiplying common shares outstanding by fiscal-year closing price. Book equity refers to stockholders' equity.
Book leverage	Debt in current liabilities plus long-term debt divided by total assets.
ROA	Net income divided by total assets.
Cash	Ratio of cash holdings to total assets
Firm age (years)	Number of years since the stock was included in the Compustat database.

Figure 1: Average MSA Happiness across the U.S.

The following figure illustrates the average happiness of 207 Metropolitan Statistical Areas (MSA) that are included in our sample for 2013. Happiness is measured by the best possible life question from the Gallup Daily Poll, which asks respondents to compare their life to the best possible life on a scale of 0-10 with 0 corresponding to the worst possible and 10 to the best possible life in terms of how the local residents view their well-being. The map contains white areas because some rural areas do not belong to any MSA and also happiness data is not collected from some MSAs.

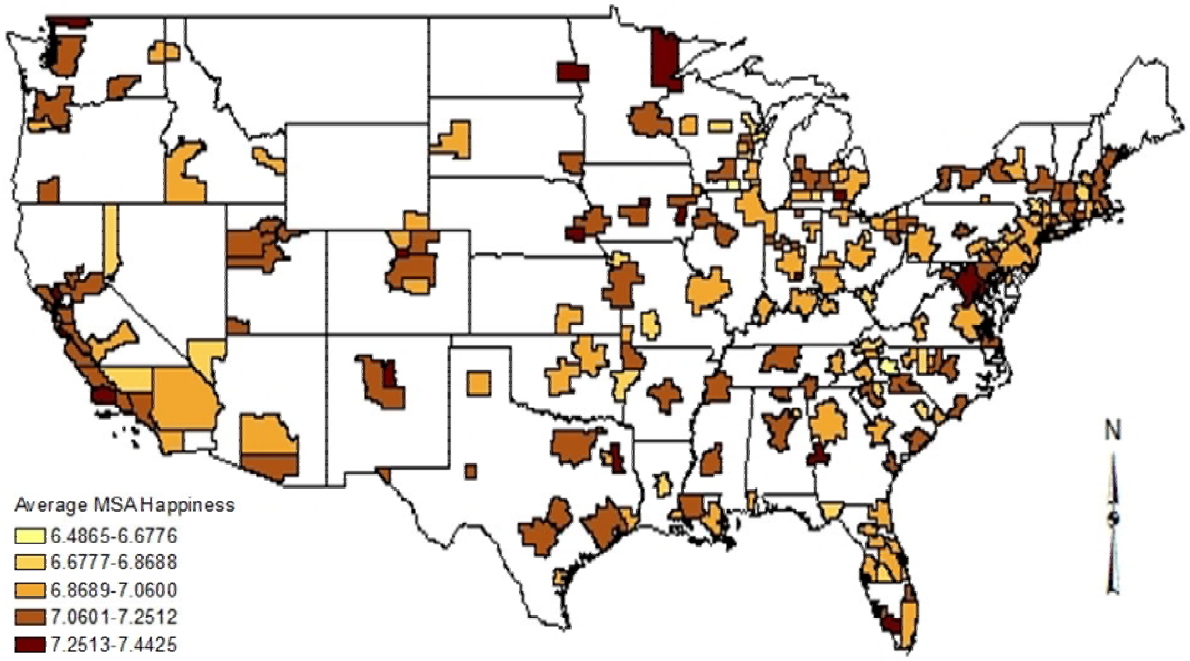

Table 1: Summary Statistics

The following table provides the descriptive statistics of the various variables used in our study. The definitions of the variables are included in the Appendix.

	Mean	Median	Min	Max	Std. Dev	*N*
Panel A: Individual level data (individual-year observations)						
Happiness	6.98	7	0	10	1.94	1,328,947
Age	54.03	55	18	99	17.53	1,313,115
Employed	0.50	1	0	1	0.50	1,335,466
Health	3.58	4	0	5	1.08	1,325,682
Married	0.55	1	0	1	0.50	1,335,466
Education	4.12	4	1	6	1.52	1,319,944
Female	0.50	1	0	1	0.50	1,335,460
Panel B: Local area characteristics (MSA-year observations)						
Evaluative happiness measures						
Local happiness	6.96	7.00	6.19	8.04	0.23	1,263
Local happiness quartile	2.32	2	1	4	1.20	1,263
Local happiness inequality quartile	2.84	3	1	4	1.21	1,263
Highest local happiness dummy	0.06	0	0	1	0.24	1,263
Local residual happiness	0.001	-0.005	-0.613	0.533	0.139	1,286
Local res. happiness quartile	2.49	2	1	4	1.11	1,263
Local res. happiness inequality quartile	2.48	2	1	4	1.12	1,263
Highest local res. happiness dummy	0.06	0	0	1	0.24	1,263
Hedonic happiness measures						
Enjoy yesterday	0.86	0.86	0.74	0.97	0.026	1,263
Happy yesterday	0.89	0.89	0.76	1	0.023	1,263
Other variables						
Population growth (%)	0.84	0.74	-1.27	4.75	0.78	1,246
Wage growth (%)	1.93	1.98	-7.07	11.11	1.66	1,246
Income growth (%)	2.03	2.08	-20.95	32.07	3.63	1,246
Income ($)	40,085.89	38,888.00	25,131	86,574	7,473	1,246
Population (thousands)	1,115	439.61	54.08	19,949.50	2,051.09	1,246
Panel C: Firm characteristics (firm-year observations)						
R&D intensity	0.08	0.001	0	0.56	0.15	23,200
Investment	0.116	0.083	0.003	0.410	0.105	23,430
Sales ($ millions)	1,321.72	188.16	0	9,962	2,541.15	24,770
Tobin's Q	3.42	1.56	0.75	22.38	5.12	22,172
Book leverage	0.30	0.18	0	1.48	0.38	24,701
ROA	-0.32	0.01	-3.31	0.17	0.84	24,610
Cash	0.19	0.11	0.003	0.74	0.21	24,589
Firm age (years)	18.98	15	0	63	15	21,807

Table 2: R&D Intensity and Local Happiness

The following table presents the results of OLS regressions with R&D intensity as the dependent variable. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			Firm age < median			Firm age > median		
	(1)		(3)	(4)		(6)	(7)	(8)	(9)
Local happiness	0.052***			0.069***			0.037***		
	(0.00)			(0.00)			(0.00)		
Local happiness		0.009***			0.012***			0.006***	
quartile		(0.00)			(0.00)			(0.00)	
Local happiness		-0.009***			-0.009***			-0.007***	
inequality quartile		(0.00)			(0.00)			(0.00)	
Highest local			0.022***			0.018**			0.021***
happiness dummy			(0.00)			(0.05)			(0.00)
Log (Sales)	-0.006***	-0.006***	-0.006***	-0.007***	-0.007***	-0.007***	-0.005***	-0.005***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tobin's Q	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***	0.002**	0.002**	0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.04)	(0.05)
Leverage	-0.010	-0.010	-0.010	-0.020**	-0.019**	-0.020**	0.001	0.001	0.001
	(0.17)	(0.17)	(0.17)	(0.04)	(0.04)	(0.04)	(0.94)	(0.94)	(0.92)
ROA	-0.031***	-0.031***	-0.031***	-0.016***	-0.017***	-0.016***	-0.045***	-0.045***	-0.045***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cash	0.183***	0.181***	0.184***	0.184***	0.181***	0.185***	0.179***	0.177***	0.179***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.303***	0.069***	0.063***	-0.439***	0.056***	0.048***	-0.204***	0.062***	0.056***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,623	19,623	19,623	8,212	8,212	8,212	11,411	11,411	11,411
R-squared	0.465	0.468	0.464	0.493	0.497	0.491	0.449	0.452	0.449

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Corporate Investment and Local Happiness

The following table presents the results of OLS regressions with Investment as the dependent variable. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			Firm age < median			Firm age > median		
	(1)		(3)	(4)		(6)	(7)	(8)	(9)
Local happiness	0.015**			0.025**			0.003		
	(0.05)			(0.03)			(0.57)		
Local happiness quartile		0.002			0.003**			0.000	
		(0.13)			(0.05)			(0.85)	
Local happiness inequality quartile		-0.002***			-0.004***			0.001	
		(0.01)			(0.01)			(0.37)	
Highest local happiness dummy			0.007**			0.009			0.004
			(0.03)			(0.12)			(0.23)
Log (Sales)	0.002**	0.002**	0.002**	0.002**	0.002**	0.002**	0.003***	0.003***	0.003***
	(0.01)	(0.01)	(0.01)	(0.04)	(0.04)	(0.04)	(0.00)	(0.00)	(0.00)
Tobin's Q	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.005***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.040***	-0.040***	-0.040***	-0.051***	-0.051***	-0.051***	-0.035***	-0.035***	-0.035***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	0.011***	0.011***	0.011***	0.018***	0.018***	0.018***	0.002	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.47)	(0.48)	(0.47)
Cash	0.039***	0.038***	0.039***	0.047***	0.046***	0.047***	0.014**	0.015**	0.014**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.04)	(0.04)
Constant	-0.024	0.081***	0.079***	-0.068	0.111***	0.106***	0.046	0.067***	0.069***
	(0.67)	(0.00)	(0.00)	(0.42)	(0.00)	(0.00)	(0.29)	(0.00)	(0.00)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,551	19,551	19,551	8,182	8,182	8,182	11,369	11,369	11,369
R-squared	0.127	0.127	0.127	0.141	0.141	0.140	0.125	0.125	0.125

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Determinants of Individual Happiness

The following table presents the results of an OLS regression with individual happiness as the dependent variable. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample
Age	-0.058***
	(0.00)
Age^2	0.001***
	(0.00)
Employed	0.089***
	(0.00)
Health	0.536***
	(0.00)
Married	0.445***
	(0.00)
Education	0.091***
	(0.00)
Female	0.223***
	(0.00)
Constant	5.298***
	(0.00)
Year fixed effects	Yes
Observations	1,289,214
R-squared	0.140

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: R&D Intensity and Local Residual Happiness

The following table presents the results of OLS regressions with R&D intensity as the dependent variable. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			Firm age < median			Firm age > median		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local res. happiness	0.006			0.009			0.004		
	(0.75)			(0.76)			(0.79)		
Local res. happiness quartile		-0.001			-0.002			0.000	
		(0.79)			(0.55)			(0.85)	
Local res. happiness inequality quartile		-0.015***			-0.017***			-0.011***	
		(0.00)			(0.00)			(0.00)	
Highest local res. happiness dummy			0.027***			0.026**			0.022***
			(0.00)			(0.02)			(0.00)
Log (Sales)	-0.006***	-0.006***	-0.006***	-0.007***	-0.007***	-0.006***	-0.005***	-0.005***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tobin's Q	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***	0.002*	0.002**	0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.05)	(0.05)
Leverage	-0.010	-0.010	-0.010	-0.020**	-0.019**	-0.020**	0.000	0.000	0.001
	(0.15)	(0.15)	(0.16)	(0.03)	(0.04)	(0.03)	(0.97)	(0.99)	(0.96)
ROA	-0.031***	-0.031***	-0.031***	-0.016***	-0.016***	-0.016***	-0.044***	-0.045***	-0.044***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cash	0.184***	0.180***	0.183***	0.186***	0.181***	0.185***	0.179***	0.176***	0.178***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.061***	0.118***	0.061***	0.046***	0.121***	0.047***	0.054***	0.094***	0.054***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,623	19,623	19,623	8,212	8,212	8,212	11,411	11,411	11,411
R-squared	0.462	0.468	0.464	0.491	0.497	0.492	0.447	0.450	0.448

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Corporate Investment and Local Residual Happiness

The following table presents the results of OLS regressions with Investment as the dependent variable. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			Firm age < median			Firm age > median		
	(1)		(3)	(4)		(6)	(7)	(8)	(9)
Local res. happiness	0.032***			0.064***			0.016		
	(0.01)			(0.00)			(0.22)		
Local res. happiness quartile		0.003***			0.005***			0.002*	
		(0.01)			(0.00)			(0.08)	
Local res. happiness inequality quartile		-0.003**			-0.004**			-0.000	
		(0.03)			(0.03)			(0.95)	
Highest local res. happiness dummy			0.012***			0.014***			0.005
			(0.00)			(0.00)			(0.24)
Log (Sales)	0.002**	0.002***	0.002***	0.003**	0.002**	0.002**	0.003***	0.003***	0.003***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)
Tobin's Q	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.005***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.040***	-0.040***	-0.040***	-0.051***	-0.051***	-0.051***	-0.036***	-0.036***	-0.036***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	0.011***	0.011***	0.010***	0.017***	0.017***	0.017***	0.002	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.44)	(0.43)	(0.44)
Cash	0.039***	0.038***	0.039***	0.047***	0.046***	0.047***	0.015**	0.015**	0.015**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.03)
Constant	0.076***	0.079***	0.080***	0.095***	0.103***	0.106***	0.069***	0.064***	0.072***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,551	19,551	19,551	8,182	8,182	8,182	11,369	11,369	11,369
R-squared	0.127	0.127	0.127	0.139	0.140	0.139	0.126	0.126	0.126

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Regressions with an Additional Local Area Control Variable

The following table presents the results of OLS regressions with R&D Intensity and Investment as the dependent variables and local population growth among the explanatory variables. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample					
	Dependent variable: R&D Intensity			Dependent variable: Investment		
	(1)	(2)	(3)	(4)	(5)	(6)
Local happiness	0.067***			0.011*		
	(0.00)			(0.06)		
Local happiness Quartile		0.010***			0.001*	
		(0.00)			(0.08)	
Local happiness inequality		-0.007***			-0.002***	
		(0.00)			(0.00)	
Highest local happiness			0.016***			0.008***
			(0.00)			(0.01)
Local population Growth	0.004***	0.001	0.009***	0.008***	0.008***	0.009***
	(0.00)	(0.63)	(0.00)	(0.00)	(0.00)	(0.00)
Log (Sales)	-0.006***	-0.006***	-0.006***	0.001***	0.001***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tobin's Q	0.003***	0.003***	0.003***	0.006***	0.006***	0.006***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.014***	-0.013***	-0.014***	-0.041***	-0.041***	-0.041***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-0.032***	-0.033***	-0.032***	0.010***	0.010***	0.010***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cash	0.197***	0.194***	0.199***	0.044***	0.043***	0.044***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.410***	0.051***	0.043***	0.032	0.108***	0.105***
	(0.00)	(0.00)	(0.00)	(0.40)	(0.00)	(0.00)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,641	19,641	19,641	19,564	19,564	19,564
R-squared	0.447	0.451	0.444	0.119	0.119	0.119

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Determinants of Individual Happiness with Local Average R&D Intensity and Corporate Investment

The following table presents the results of OLS regressions with individual happiness as the dependent variable. Previous year's average and average residual R&D intensity and Investment of local firms are included among the explanatory variables along with the standard determinants of individual happiness. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			
	(1)	(2)	(3)	(4)
Local average investment	0.156			
	(0.22)			
Local ave. R&D intensity		-0.082		
		(0.37)		
Local ave. residual investment			-0.066	
			(0.58)	
Local ave. residual R&D intensity				0.036
				(0.78)
Age	-0.058***	-0.058***	-0.059***	-0.059***
	(0.00)	(0.00)	(0.00)	(0.00)
Age^2	0.001***	0.001***	0.001***	0.001***
	(0.00)	(0.00)	(0.00)	(0.00)
Employed	0.089***	0.089***	0.089***	0.090***
	(0.00)	(0.00)	(0.00)	(0.00)
Health	0.526***	0.526***	0.526***	0.526***
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.436***	0.436***	0.436***	0.436***
	(0.00)	(0.00)	(0.00)	(0.00)
Education	0.075***	0.076***	0.076***	0.076***
	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.249***	0.249***	0.248***	0.249***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	5.464***	5.484***	5.481***	5.481***
	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	1,052,251	1,052,090	1,039,718	1,042,002
R-squared	0.136	0.136	0.136	0.136

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: Changes in R&D Intensity and Investment Following Corporate Relocations

The following table presents the results of OLS regressions with changes in R&D Intensity and Investment as the dependent variables. The sample consists of firms in our sample that relocated their corporate headquarters during 2008-2012. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Dependent variable: Δ R&D intensity		Dependent variable: Δ Investment	
	(1)	(2)	(3)	(4)
Δ Local happiness	0.095	0.079	0.279*	0.283*
	(0.54)	(0.59)	(0.06)	(0.07)
Δ Log (Sales)		-0.018		0.058**
		(0.51)		(0.05)
Δ Tobin's Q		0.011		0.006
		(0.32)		(0.62)
Δ Leverage		0.174		0.009
		(0.28)		(0.96)
Δ ROA		-0.058		0.024
		(0.31)		(0.69)
Δ Cash		0.307		-0.052
		(0.11)		(0.79)
Constant	0.000	-0.001	-0.035*	-0.047**
	(0.99)	(0.95)	(0.06)	(0.02)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	47	44	47	44
R-squared	0.037	0.389	0.239	0.377

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Regressions with Hedonic Measures of Happiness

The following table presents the results of OLS regressions with R&D Intensity and Investment as the dependent variables and local average hedonic measures of happiness as the explanatory variables. The variable definitions are included in the Appendix. Standard errors are clustered by MSA, and *p*-values are reported in the brackets.

	Full sample			
	Dependent variable: R&D intensity		Dependent variable: Investment	
	(1)	(2)	(3)	(4)
Enjoy yesterday	0.455**		-0.027	
	(0.01)		(0.71)	
Happy yesterday		0.410**		-0.051
		(0.03)		(0.51)
Log (Sales)	-0.006***	-0.006***	0.002**	0.002**
	(0.00)	(0.00)	(0.01)	(0.01)
Tobin's Q	0.003***	0.003***	0.006***	0.006***
	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.010	-0.010	-0.040***	-0.040***
	(0.17)	(0.17)	(0.00)	(0.00)
ROA	-0.031***	-0.031***	0.011***	0.011***
	(0.00)	(0.00)	(0.00)	(0.00)
Cash	0.184***	0.184***	0.039***	0.039***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.327**	-0.304*	0.102	0.125*
	(0.04)	(0.08)	(0.13)	(0.09)
State fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	19,623	19,623	19,551	19,551
R-squared	0.465	0.464	0.127	0.127

* significant at 10%; ** significant at 5%; *** significant at 1%