Intangible Investments and the Cross-Section of Stock Returns

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Abstract

In this paper, we examine whether reporting intangible investments including R&D and SG&A as an expense affects firms' stock returns. Each of these two components is important in predicting stock returns in the future. We also present the interactions between R&D and SG&A in their relations with the stock returns. Our findings suggest that both of the intangible investment components are important and they include independent information in predicting stock returns. We propose a comprehensive measure of intangible investments including both of firms' R&D and SG&A expenditures. The equal- and value-weighted average return spreads are all between 1.42% and 1.58% at the monthly level between the intangible-investment-sorted quintiles. They are highly significant at the 1% level. After controlling for one component, the return spread sorted on another component is still large and significant. These findings suggest that both of the intangible investment components are important and they include independent information in predicting stock returns.

Keywords: Intangible Investments, R&D, SG&A

1. Introduction

"Great achievements do not simply and merely come from how many R&D dollars you expense. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D than Apple did. Great achievements also come from investments in human resource, customer and organizational systems." (Steve Jobs, 1998)

Understanding the nature and comprehensive components of intangible investments is an important theme in accounting**,** finance, and economics research. Intangible-investment-intensive firms support 45.5 million jobs and contribute $6.6 trillion in value added, equivalent to 38.2% of U.S. GDP (USPTO[1], 2016). With Generally Accepted Accounting Principles[2] mandating that a firm's intangible investments cannot be recognized as an asset but must instead be expensed, their contribution to a company's long term success and value is often ignored. Therefore, it is crucial to understand the role of intangible investments in a firm's value and its stock market performance.

In this paper, we provide a comprehensive investigation on whether internally-generated intangible investments of firms are associated with the cross-section of stock returns in the future. Our definition of intangible investments refers to a firm's long term investments that are recognized as an expense, although they are made with the objective of increasing the firm's future benefits. For this purpose, we follow Peters and Taylor (2017) and include both knowledge investments[3] measured by Research and Development (R&D) expenditures and

[1] Intellectual Property and the U.S. Economy: 2016 Update – U.S. Patent and Trademark Office (USPTO)
[2] FASB141; FAS 2; and SFAS141.
[3] Knowledge capital, which relates to knowledge-based assets such as patents, trademarks, copyrights, know-how, permits, and licenses (FASB 141).

investments in human resources, customer relationships and databases, and distribution and supplier systems, measured by selling, general, and administration (SG&A) into our comprehensive measure of intangible investments. We recognize that some components of SG&A have short-term effects on firm value (such as advertising with the objective of short-term sales, commissions, and utilities expense), while other components of SG&A, such as corporate and IT infrastructure, directors' remuneration package, and marketing expense with the objective of improving long-term sales, have much longer effects on the firm's future earnings. In this study, we include only the long-term investment portion of SG&A, which is expected to have a longer term effect on a firm's value and stock returns.

In order to turn innovative products into revenues and market value, firms require investments in both R&D and SG&A, which includes human resources and organizational systems, customer relationships and databases and market research[4], and IT, computerized data, and software development. While current literature puts a bright spotlight on R&D, it may cause a bias if R&D is counted as the only component of intangible investments. In fact, Committee for Study of Invention (2004) shows that only 10% of new chemical formulas make it out of R&D labs and less than 1% of patents have substantial commercial value. Additionally, if only R&D is included to measure intangible investments, a large proportion of firms that have other-than-R&D intangible investments are not included in the sample. In our study, firms which report no R&D expenditures in any single year during the period 1970-2019 are over 50% of the total sample. Therefore, we include both components in our comprehensive measure of intangible investments in this study.[5]

[4] Firms in high rank of intangible investments such as pharmaceutical firms typically have large marketing budgets designed, in part, to launch new products. Some fractions of these expenses are used to establish new drugs in the market place, and, once established, resulting in brand value and competitive advantage for the firm. With that logic, the marketing of a new product (i.e. drugs for pharmaceutical firms) is a complementary co-investment with R&D and therefore part of intangible investments.

[5] Professional associations such as the American Society of Appraisers; larger accounting firms such as E&Y, PWC, and KMPG;

Prior literature has shown the importance of intangible investments in strengthening firms' competitive advantage and value. Resource-based theory suggests that intangible resources, such as brand value, human resources, technology, and customer databases, are the main drivers of the sustainability of performance differences across firms (Itami, 1987). Porter (1991) argues that the more intangible resources a firm has, the greater the sustainability of its competitive advantage. Additionally, Tobin's Q theory shows that human resources and innovation bring a sustainable competitive advantage to the firm (Tobin & Brainard, 1976). Abel and Eberly (1994) and Abel (2015) point out that similar to physical investment, intangible investment is high-priced and increases future profitability. Spending on intangibles is classified as an intangible investment because it reduces a firm's current cash flow in order to increase future cash flow (Corrado, Hulten, & Sichel, 2005; Corrado & Hulten, 2010).

The impact of the two components in intangible investments, R&D and SG&A expenditures have also been examined on firms' stock market performance separately in the current literature. Lev and Sougiannis (1996) provide a thorough analysis of R&D investments; Chan, Lakonishok, and Sougiannis (2001) show that firms with high R&D to equity market value earn large excess returns. Lev, Sarath, and Sougiannis (2005) find evidence of mispricing that stocks of growth firms with high R&D expense are systematically undervalued, and this immediate expensing of R&D will lead to systematic performance reporting biases compared to capitalizing. Lev (2018) explains that expensing (rather than capitalizing) R&D causes a huge loss to a firm's earnings, which is an important driver in market valuation, and sends misleading information to investors and the market.

and prominent investment bankers such as UBS, Deutsche Bank, and Morgan Stanley also use comprehensive intangible investments similar to those used in this study to conduct a firm's valuation in leveraged buyouts or mergers and acquisitions (Parr, 1991; Rosenbaum & Pearl, 2013).

Lev and Radhakrishnan (2005) analyze the valuation of organization capital. Eisfeldt and Papanikolaou (2013) measure the stock of organization capital by cumulating firms' SG&A expenses and show that firms with higher ratio of organization capital to book assets have average returns 4.6% higher than firms with less organization capital annually. Belo, Lin, and Vitorino (2014) demonstrate that more brand-investment-intensive firms earn 5.1% higher average stock returns than less brand-investment-intensive firms per year. Enache and Srivastava (2018) propose a method to estimate intangible investment outlays from the SG&A expenses. They confirm that these investments affect future firm performance and risk. Banker, Huang, Natarajian, and Zhao (2019) indicate that firms with high SG&A intangible asset values earn excess returns. They suggest that these excess returns are due to investor mispricing than to risk compensation.

In our study, we extend our sample from 1970 to 2019 and focus on understanding the different role of the two intangible investment components (R&D and SG&A expenses) on firm stock returns and their relative importance. We first sort firms into quintile portfolios based on the ratio of their R&D expenses to long-term assets. The equal- and value-weighted returns on the highest R&D sorted quintile are 1.41% and 1.49% higher than those of the lowest R&D quintile, respectively at the monthly level. Both are significant at the 1% level. When we sort firms based on the ratio of their SG&A expenses to long-term assets, we find that the equal- and value-weighted monthly average returns on the highest SG&A sorted quintile are 1.24% and 1.38% higher than those of the lowest SG&A quintile, respectively. They are also significant at the 1% level. We then construct a comprehensive measure of intangible investments following Peters and Taylor (2017), including both R&D and SG&A. When firms are sorted on this more inclusive measure, our results show that the equal- and value-weighted

monthly average returns on the highest quintile are 1.42% and 1.58% higher than those of the lowest quintile, respectively. They are once again significant at the 1% level.

These findings indicate that both of the components of intangible investments are important to stock returns of firms. Are they independent of each other? We conduct two-way dependent sorting to examine their relation. We first sort firms into quintiles based on their SG&A ratios, and then sort firms into quintiles based on their R&D ratios within each SG&A-sorted quintile. Both of the equal- and value-weighted returns suggest that the spreads between the highest and lowest R&D sorted quintiles are significantly positive, even after we control for firms' SG&A expense ratio. Similarly, when we switch the order, the spreads between the highest and lowest SG&A-sorted quintiles are significantly positive, even after we control for firms' R&D expense ratio. Although R&D and SG&A expenditures are highly correlated, the results from our spanning tests demonstrate that the two components in intangible investments include independent information and both of them are important. Our results are consistent with the findings from Fama-MacBeth (1973) regressions. They are also robust when we calculate adjusted returns from the Fama and French (1993) three-factor model, Carhart (2001) four-factor model, Fama and French (2015) five-factor model, and Hou, Xue, and Zhang (2015) q-factor model, respectively. These results indicate that none of the two components in intangible investments can be captured by the investment factors in the new benchmark models. Our findings also hold in most industries, except for the Consumer Goods industry.

This paper contributes to the literature in two ways. First, it provides a comprehensive measure for intangible investments, which is a theoretically meaningful measure used in practice. We show that both of firms' R&D and SG&A expenditures are important in predicting stock returns in the future.

Second, the study shows that the two components in intangible investments include independent information, although they are highly correlated. R&D investments are on knowledge capital, while SG&A expenditures are on organization capital. Therefore, they have separate functions. These intangible investments cannot be explained by the new investment factors in the current literature.

The rest of the paper is organized as follows. Section 2 describes the data and intangible investments measures. We calculate the return differences between the intangible-investment-sorted portfolios and conduct spanning tests to examine the two intangible investment components in Section 3. The final section discusses the implications of key findings and concludes the paper.

2. Data and Measures

2.1 Data and Sample Selection

Our sample includes all domestic firms with common stocks (share code 10 & 11) listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and NASDAQ stock markets. We drop firm-year observations with negative values of total assets, sales, R&D expenses, and SG&A expenses during the sample period. We also drop firms with missing values of R&D expenses and SG&A expenses. The monthly data on stock returns, stock prices, and number of shares outstanding are obtained from the Center for Research in Security Prices (CRSP). Financial statement data are obtained from COMPUSTAT for the following variables: sales (item no. 12), SG&A expenditures (item no. 189), R&D expenditures (item no. 46), and book value of common equity (item no. 60).

We use data from 1975 to 2019 because 1975 is the first year that the Federal Accounting

Standards Board (FASB) mandated that U.S. firms disclose R&D as an expense when incurred (FASB, 1975). Furthermore, to be included in the tests, a stock must have the CRSP stock price for December of year $t - 1$ and June of year t and the COMPUSTAT book equity for year $t - 1$.

To ensure that accounting variables are available to explain the stock returns, following Fama and French (1992), we match stock returns for the period between July of year t to June of year $t + 1$ to the accounting data of a firm for the fiscal year ending in calendar year $t - 1$. Firms with missing monthly returns are excluded from the sample for that particular year. Book equity is defined by COMPUSTAT as the book value of stockholders' equity. For industry analysis, following Peters and Taylor (2017) and Sun and Xiaolan (2019), we use the Fama-French 5-industry classifications[6]. In addition, we construct the other variables as follows:

(1) Measurement of R&D, SG&A Investments, and Intangible Investments Variables

As explained above, the intangible investments measure includes both R&D expenditures and the investments component of SG&A expenditures. In this section, we explain the measurement of each component as well as the combination of those two components.

(2) Measuring R&D: Flow Method vs. Stock Method

The literature applies the perpetual inventory method to recursively derive the stock of R&D capital (Lev and Sougiannis, 1996; Chan, Lakonishok, & Sougiannis, 2001; Lev, Sarath, & Sougiannis, 2005). Specifically, this method uses a straight-line rate of 20 percent per year to calculate R&D amortization, which is used to adjust net income (item no. 172 in COMPUSTAT) and book values of common equity (item no. 60 in COMPUSTAT). The R&D capital measure is the sum of the unamortized previous R&D expenditures. This method is particularly effective in

[6] We download the 5-industry classification information from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html

measuring the remaining useful value of past investments that could potentially be presented in the balance sheet. Thus, the R&D capital measure is also effective for analyzing R&D reporting biases when presenting the difference between earnings and book value of common equity using R&D expensed versus R&D capitalized.

Different from the perpetual inventory method, we use a flow method, which considers R&D expenditures as disclosed in the income statement. We use R&D expenditures instead of R&D capital because of our focus on the firm mispricing as consequences of expensing intangible investments. Lev, Sarath, and Sougiannis (2005) provide a complementary explanation as to why R&D expenditures lead to a significant reporting profitability bias effect as well as misvaluation.

(3) Measuring Investment Components of SG&A Expenditures

As mentioned previously, this study incorporates an SG&A component in the intangible investments measure because in order to turn innovative products into significant revenues and create future value, firms require both R&D and other-than-R&D investments, which are proxied by certain SG&A expenditures.

However, as explained earlier, it is problematic to use an SG&A variable without disaggregating it into portions which have either short-term or long-term effects on a firm's value. Peters and Taylor (2017) and Sun and Xiaolan (2019) count 30% of SG&A spending as its long-term investment portion; the remaining 70% is considered operating costs. Similarly, Hulten and Hao (2008) apply 30% portion to capture the investments in organizational development and worker training. We exclude R&D from SG&A for two reasons: 1) we want to analyze R&D expenditures separately as a proxy for knowledge investments and 2) R&D is confusingly incorporated into SG&A by COMPUSTAT even though firms report R&D separately in their 10-

K filings[7].

(4) Measuring Intangible Investments

We measure the intangible investment of a firm *i* at time *t* as the sum of the firm's R&D expenditures and the long-term investments portion (or 30%) of SG&A expenditures reported for the same time period, which is defined as follows:

$$Intangible\ Investments_{it} = R\&D_{it} + InvestmentSG\&A_{it}$$

In order to mitigate the heteroscedasticity problem, an intangible investments ratio (*IIR* hereafter) is obtained by scaling a firm's intangible investment to its long-term assets:

$$IIR_{it} = \frac{Intangible\ Investments_{it}}{Long - Term\ Assets_{it}}$$

2.2 Summary Statistics

As we have mentioned, we use data from 1975 to 2019 because 1975 is the first year that the Federal Accounting Standards Board (FASB) mandated that U.S. firms disclose R&D as an expense when incurred (FASB, 1975).

We identify the first year when a firm has a positive XRD and include the firm-year observations starting from this point on. In that sample, after first year of a firm reporting a positive XRD, we still include a firm-year observation even if the firm reports zero for XRD for any year beyond the starting year.

[Insert Table 1 here]

Table 1 reports the summary statistics for XRD, XSGA, Intangible Investments, BM, and MVE. XRD is COMPUSTAT Research and Development expenditures, scaled by long-term

[7] This confusing data issue of COMPUSTAT has been mentioned in Peters and Taylor (2017).

assets. XSGA is COMPUSTAT Selling, General, and Administration expenditures excluding Research and Development expenditures, scaled by long-term assets. Long-term assets are assets from COMPUSTAT minus current assets from COMPUSTAT. BM is COMPUSTAT stockholder's equity from divided by market value. MVE is the COMPUSTAT market value, which is PRCC_F * CSHO.

3. Empirical Analysis

3.1 Benchmark Models

We use Carhart's (1997) *Momentum* factor as an extension of the Fama-French (1993) three-factor model to analyze the relationship between IIR and abnormal stock returns at the firm level and the industry level (H1). To control for factor risk, the abnormal returns on test portfolios are regressed on the Carhart four-factor model, defined as below:

$$R_{p,t} - R_{ft} = \propto_p + \beta_{Mkt,p}\,(Mkt_t - R_{ft}) + \beta_{SMB,p}\,SMB_t + \beta_{HML,t}\,HML_t + \beta_{Momentum,p}\,Momentum_t + \varepsilon_{p,t}$$

where

$R_{p,t} - R_{ft}$ is the monthly return on portfolio *p* in excess of the Treasury bill rate in month *t*,

$\propto_p$ is the estimated intercept from this regression and captures the risk-adjusted returns on IIR-sorted portfolios,

$Mkt_t - R_{ft}$ is the excess returns on the market index,

SMB_t is the size factor and is the difference between the returns on a portfolio of small stocks and the returns on a portfolio of large stocks (SMB refers to Small Minus Big),

HML_t is the B/M factor and is the difference between the returns on a portfolio of high B/M stocks (or the top 30%) and the returns on a portfolio of low B/M stocks (or the

bottom 30%) (HML refers to High Minus Low), and

$Momentum_t$ is the difference between the returns on a portfolio of stocks with high prior year returns (or the top 50%) and the returns on a portfolio of stocks with low prior year returns (or the bottom 50%).

We also use Fama-French 5-factor model (2015). To control for factor risk, the abnormal returns on test portfolios are regressed on the on Fama-French 5-factor model, defined as below:

$$R_{p,t} - R_{ft} = \propto_p + \beta_{Mkt,p}\,(Mkt_t - R_{ft}) + \beta_{SMB,p}\,SMB_t + \beta_{HML,t}\,HML_t + \beta_{CMA,p}\,CMA_t + \beta_{RMW,p}\,RMW_t + \varepsilon_{p,t}$$

where

$R_{p,t} - R_{ft}$ is the monthly return on portfolio *p* in excess of the Treasury bill rate in month *t*,

$\propto_p$ is the estimated intercept from this regression and captures the risk-adjusted returns on IIR-sorted portfolios,

$Mkt_t - R_{ft}$ is the excess returns on the market index,

SMB_t is the size factor and is the difference between the returns on a portfolio of small stocks and the returns on a portfolio of large stocks (SMB refers to Small Minus Big),

HML_t is the B/M factor and is the difference between the returns on a portfolio of high B/M stocks (or the top 30%) and the returns on a portfolio of low B/M stocks (or the bottom 30%) (HML refers to High Minus Low), and

CMA_t is the average return on the two conservative investment portfolios minus the average return on the two aggressive investment portfolios (CMA refers to Conservative Minus Aggressive).

RMW_t is the average return on the two robust operating profitability portfolios minus the

average return on the two weak operating profitability portfolios (RMW refers to Robust Minus Weak)

3.2. Portfolio Returns Single-Sort by Industry Breakpoints

Starting with July in year *t*, we sort all stocks into quintiles, in ascending order, based on our measures in year *t – 1*. Quintile 1 (Lowest) corresponds to the 20% of portfolios with the lowest IIR, while quintile 5 (Highest) corresponds to the 20% of portfolios with the highest measure. The firms remain in these portfolios from July of year *t* to June of year *t + 1*. The portfolios are rebalanced each year.

[Insert Table 2 here]

Tables 2, 3, and 4 present one-way sorting of R&D, SG&A, and Intangible Investments accordingly. We follow Peters and Taylor (2017) and Sun and Xiaolan (2019) to use Fama-French 5-industry classifications. In table 2, we first sort into R&D quintiles within each of the five industry, then calculate the equal-weighted and value-weighted average returns across industries. The equal- and value-weighted returns on the highest R&D sorted quintile are 1.41% and 1.49% higher than those of the lowest R&D quintile, respectively at the monthly level. Both are significant at the 1% level. The results are also robust when we calculate adjusted returns from the CAPM model, the Fama and French (1993) three-factor model, Carhart (2001) four-factor model, Fama and French (2015) five-factor model, and Hou, Xue, and Zhang (2015) q-factor model, respectively.

[Insert Table 3 here]

Tables 3 and 4 shows the significant results of portfolio returns of SG&A and Intangible Investments by industry breakpoints for not only equal-weighted but also value-weighted, not only for average returns but also for adjusted returns for the five models above.

[Insert Table 4 here]

The zero R&D, which includes firms not reporting any R&D expenditures during the 1975-2019. period.

3.3 Dependent-Sorting Portfolios

Although both of the components of intangible investments are important to stock returns of firms, we conduct two-way dependent sorting to examine whether they are independent of each other.

[Insert Table 5 here]

In table 5, portfolios are formed by sorting first into (SG&A / Long-term assets) quintiles, then in each quintile, the portfolios are sorted further by (R&D / Long-term assets).

[Insert Table 6 here]

In table 6, portfolios are formed by sorting first into (R&D / Long-term assets) quintiles, then in each quintile, the portfolios are sorted further by (SG&A / Long-term assets).

The return spread between high quintile and low quintile in both tables 5 and 6 are significant at 1% level.

3.4 Fama-MacBeth Regressions of Stock Returns on Intangible Investments

To further examine the relation between intangible investments and stock returns, we conduct FM regressions of monthly stock returns on intangible investments while controlling for other firm characteristics. The FM approach is more robust to heteroscedasticity than the cross-section regression method and panel (pooled time-series cross-section) regression method (Fama & French, 2002). Specifically, the FM approach can capture robust standard errors by reducing variations of year-to-year slopes and lowering the standard error of the average slope.

In this FM approach, regressions are conducted for every month from 1975 to 2019, and then the time-series means of annual cross-sectional coefficient estimates are reported along with time series t- statistics. To adjust for the serial correlation in the time series of the correlation coefficient, we use a Newey-West procedure with six lags to correct clustered standard errors. we estimate equations of the following form:

$$R_{i,t} - R_{ft} = \alpha_t + \beta_t Measures_{it} + \sum_{k=1}^{K} \theta_{kt} X_{it} + \varepsilon_{it}$$

where

$R_{i,t} - R_{ft}$ is the excess returns of stock *i* in month *t+1*

X_{it} are control variables, which are firm characteristics *i* at month *t*: *Size* (*ME), B/M*, momentum (past 1 year's stock return), and beta, and

IIR_{it} is the intangible investment ratio

[Insert Table 7 here]

A positive and significant of β_t in all Panels A, B, and C of Table 7 shows a strong cross-sectional correlation between intangible investments, as well as R&D and SG&A. The first column of Panels A, B, and C shows that firms with higher intangible investments, R&D, or SG&A earn higher average stock returns. When controlling for existing firm characteristics, the coefficient of these measures remains positive and statistically significant at the 1% level.

3.5 IIR and Time-Series Variation in Stock Returns

The analysis presented in the preceding sections supports H1 that firms with higher IIR have higher future stock returns, but common firm characteristics such as *Market risk, Size, B/M,*

and *Momentum* do not explain the cross-sectional variations generated by IIR. Thus, the next question is whether existing risk factors and macro-economic indexes explain the IIR premium. The stock market's performance is affected not only by firms' accounting performance, but also by the economy status of the nation in general. Inflation, government bond yields, and GDP growth rates are all important indicators of economic development (Hou & Robinson, 2006).

To analyze the relationship between intangible investments and existing risk factors such as *Market, SMB, HML, Momentum* and macro-economic indexes, we conduct the following time-series regression of IIR premiums on a number of combinations of risk factors and economic indicators:

$$\beta_t^{IIR} = \alpha + \sum_{i=1}^{I} \gamma_i F_{it} + \sum_{k=1}^{K} \theta_k X_{kt} + \varepsilon_t$$

where

β_t^{IIR} is the time-series of IIR risk premiums obtained from the FM regressions,

F_{it} are returns to factor-mimicking portfolios in month *t*, including *SMB*, *HML*, and *Momentum*, and

X_{kt} are values of the business cycle indicators in month *t*: monthly rate of inflation, term spread, T-bill rate, GDP, and quarterly growth rate

[Insert Table 8 here]

3.6 Robustness Checks

We use Fama-French 5-industry classification to conduct robustness check for the significance returns spread. Table 9A presents industry-sorting for R&D quintiles while tables 9B and 9C present SG&A and Intangible Investments quintiles respectively. While the returns spread

results for Industry 1, which includes Consumer Durables, Non-Durables, Wholesale, Retail, and Some Services (Laundries, Repair Shops), is not significant, the other industries' results are strongly significant, especially for Industry 3 (Business Equipment, Telephone and Television Transmission), Industry 4 (Healthcare, Medical Equipment, and Drugs), and Industry 5 (Mines, Construction, Building Materials, Trans, Hotels, Business Services, Entertainment).

[Insert Table 9 here]

4. Conclusions

This paper contributes to the literature in two ways. First, it provides a comprehensive measure for intangible investments, which is a theoretically meaningful measure used in practice. We show that both of firms' R&D and SG&A expenditures are important in predicting stock returns in the future. Second, the study shows that the two components in intangible investments include independent information, although they are highly correlated. R&D investments are on knowledge capital, while SG&A expenditures are on organization capital. Therefore, they have separate functions. Additionally, these intangible investments cannot be explained by the new investment factors in the current literature.

Appendices

Appendix A: Variable Definitions

The data are from the Center for Research in Security Prices (CRSP) and COMPUSTAT. Most of the variables used to forecast returns are measured once a year. Thus, we use information available in June of year *t* to forecast the returns in July of *t* to June of *t+1*. The exceptions are the momentum and idiosyncratic risk variables, which are measured monthly. Time *t* for the COMPUSTAT variables in the descriptions below are for the fiscal year end in calendar year *t*.

Variable Name	Description
AT	Total Book Asset (COMPUSTAT data item 6).
B/M	Book-to-market equity is the natural log of the ratio of the book value of equity to the market value of equity. Book equity is Common Shareholders' Equity. Market equity is fiscal year-end stock price times shares outstanding, from COMPUSTAT, following Fama and French (1992).
IIR	Intangible Investments Ratio is formed by dividing the sum of R&D & the long-term portion of SG&A expenditures by *Market Value*.
IIR(A)	Alternative Intangible Investments Ratio, is formed by dividing the sum of R&D & 30% of SG&A expenditures by the firm's *LTA*.
LTA	Long-term assets is total assets (COMPUSTAT item AT) minus current assets (COMPUSTAT item ACT).
Market Value	Market value of shares outstanding (COMPUSTAT items prcc_f times csho).
Momentum	The cumulated continuously compounded stock return from month *t*-12 to

month *t*-2, where *t* is the month of the forecasted return.

R&D Research and development expenditures, from COMPUSTAT.

SG&A Selling, general, and administrative expense, from COMPUSTAT excluding *R&D*.

Appendix B: 27 Items of SG&A – Annual Data Item Number 189

As per COMPUSTAT Manual (User 05, p. 254), SG&A include 27 items, representing all commercial expenses of operation (such as, expenses not directly related to product production) incurred in the regular course of business pertaining to the securing of operating income:

1. Accounting expense
2. Advertising expense
3. Amortization of research and development costs
4. Bad debt expense (provision for doubtful accounts)
5. Commissions
6. Corporate expense
7. Delivery expenses
8. Directors' fees and remuneration
9. Engineering expense
10. Extractive industries' lease rentals or expense, delay rentals, exploration expense, research and development expense, and geological and geophysical expenses, drilling program, marketing expenses, and carrying charges on non-producing properties
11. Financial service industries' labor, occupancy and equipment, and related expenses
12. Foreign currency adjustments when included by the company
13. Freight-out expense
14. Indirect costs when a separate Cost of Goods Sold figure is given
15. Labor and related expenses (including salary, pension, retirement, profit sharing, etc.) for bonus and stock options, employee insurance, and other employee benefits when reported below a gross profit figure)

16. Legal expense

17. Marketing expense

18. Operating expenses when a separate Cost of Goods Sold figure is given and no Selling, General, and Administrative Expense figure is reported

19. Parent company charges for administrative services

20. Recovery of allowance for losses

21. Research and development firms' company-sponsored research and development

22. Research and development expense

23. Restaurants' preopening and closing costs

24. Retail firms' preopening and closing costs and rent expense

25. Severance pay (when reported as a component of Selling, General and Administrative Expenses)

26. State income tax when included by the company

27. Strike expense

Appendix C: Intangible Investments vs. Intangible Assets

Intangible investments and intangible assets are important and popular terms in the finance, accounting, and marketing literature. Nonetheless, the lack of detailed differentiation of these terms may cause confusion. We clearly distinguish between the two terms as below.

Intangible assets

According to FAS 142/ IAS 38, an asset is identifiable if it is separable, i.e. is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged. An intangible asset[8] is an asset acquired externally from an outsourcer, or from merger and acquisitions[9] or meets recognized criteria.

Intangible investments

Intangible investment is an internally-developed expense and is located in a firm's Income Statement.

Recognition criteria

Intangible investments are recognized as intangible assets if, and only if, (a) it is probable that the expected future economic benefits that are attributable to the assets will flow to the entity; and (b) the cost of the assets can be measured reliably. This means that any intangible assets listed on a balance sheet were most likely gained from the acquisition of other business or purchased outright as individual assets. Before being officially valued for some special event such as a merger and acquisition, those internally developed items are in the form of an expense such as R&D, and part of SG&A[10].

[8] Annual data number 33 in COMPUSTAT and in IAS 38.

[9] In order for an item to be officially classified as an intangible asset, a valuation professional must follow IAS 38 and IFRS3 PPA.

[10] COMPUSTAT Annual data item 189.

Table 1

Panel A: Summary statistics

Variables	Mean	Median	Standard Deviation	25th Percentile	75th Percentile
XRD	0.463	0.118	0.960	0.036	0.381
XSGA	1.571	0.651	3.725	0.313	1.357
Intangible Investments	0.984	0.589	1.431	0.163	0.794
BM	0.635	0.480	0.617	0.250	0.794
MVE	1323	147	2692	29	901

Panel B: Pearson Correlation

	XRD	XSGA	Intangible Investments	Returns	MVE
XSGA	0.71838				
	<.0001				
Intangible Investments	0.92266	0.89402			
	<.0001	<.0001			
Returns	0.02429	0.01243	0.02029		
	<.0001	<.0001	<.0001		
MVE	-0.0641	-0.06141	-0.06402	-0.00119	
	<.0001	<.0001	<.0001	0.2555	
BM	-0.03169	-0.01612	-0.02478	-0.00837	-0.01369
	<.0001	<.0001	<.0001	<.0001	<.0001

XRD is COMPUSTAT Research and Development expenditures, scaled by long-term assets. XSGA is COMPUSTAT Selling, General, and Administration expenditures excluding Research and Development expenditures, scaled by long-term assets. Long-term assets are assets from COMPUSTAT minus current assets from COMPUSTAT. BM is COMPUSTAT stockholder's equity from divided by market value. MVE is the COMPUSTAT market value, which is PRCC_F * CSHO.

Table 2
Portfolio Returns Single Sort of R&D, by Industry break-points

	R&D Quintiles							
	Zero	1 (Low)	2	3	4	5 (High)	*Spread (5 - 0)*	*Spread (5 - 1)*
Panel A: Equal-Weighted Industry Returns of R&D Sorted Portfolios								
Average Returns	*1.45*	1.41	1.47	1.99	2.25	2.82	*1.37****	1.41***
	(4.20)	(5.38)	(5.58)	(6.50)	(6.82)	(7.23)	*(4.74)*	(6.13)
CAPM Alpha	*0.89*	0.88	0.94	1.46	1.70	2.26	*1.37****	1.38***
	(2.82)	(3.75)	(3.95)	(5.14)	(5.64)	(6.24)	*(4.85)*	(6.07)
FF3 Alpha	*0.86*	0.87	0.95	1.50	1.76	2.34	*1.48****	1.47***
	(2.73)	(3.70)	(4.04)	(5.27)	(5.70)	(6.49)	*(5.05)*	(6.55)
Carhart Alpha	*0.94*	0.96	1.00	1.58	1.78	2.40	*1.46****	1.44***
	(2.88)	(3.98)	(4.18)	(5.34)	(5.53)	(6.42)	*(4.87)*	(6.31)
FF5 Alpha	*0.91*	0.94	1.02	1.63	1.87	2.47	*1.56****	1.53***
	(2.83)	(3.92)	(4.23)	(5.56)	(5.98)	(6.67)	*(5.34)*	(6.60)
HXZ Alpha	*0.99*	0.97	1.01	1.69	1.85	2.52	*1.53****	1.55***
	(2.85)	(4.11)	(4.13)	(5.33)	(5.31)	(6.33)	*(4.49)*	(5.74)
Panel B: Value-Weighted Industry Returns of R&D Sorted Portfolios								
	Zero	1 (Low)	2	3	4	5 (High)	*Spread (5 - 0)*	*Spread (5 - 1)*
Average Returns	*1.57*	1.52	1.55	2.03	2.35	3.01	*1.44****	1.49***
	(4.83)	(6.19)	(6.30)	(7.08)	(7.37)	(7.91)	(5.24)	(7.91)
CAPM Alpha	*1.02*	1.01	1.05	1.53	1.81	2.47	*1.45****	1.46***
	(3.43)	(4.53)	(4.61)	(5.65)	(6.17)	(6.91)	(5.26)	(6.91)
FF3 Alpha	*1.00*	1.00	1.06	1.58	1.88	2.53	*1.53****	1.53***
	(3.38)	(4.48)	(4.70)	(5.81)	(6.22)	(7.13)	(5.48)	(7.13)
Carhart Alpha	*1.09*	1.11	1.12	1.66	1.91	2.61	*1.52****	1.50***
	(3.58)	(4.85)	(4.85)	(5.86)	(6.09)	(7.05)	(5.34)	(7.05)
FF5 Alpha	*1.05*	1.07	1.14	1.70	1.97	2.67	*1.62****	1.60***
	(3.45)	(4.67)	(4.89)	(6.05)	(6.42)	(7.35)	(5.83)	(7.35)
HXZ Alpha	*1.12*	1.11	1.14	1.75	1.99	2.75	*1.63****	1.64***
	(3.47)	(4.92)	(4.81)	(5.78)	(5.89)	(7.08)	(5.10)	(7.08)

Table 3
Portfolio Returns Single Sort of SG&A, by Industry break-points

SG&A Quintiles

	Zero	1 (Low)	2	3	4	5 (High)	Spread (5 - 0)	Spread (5 - 1)
Panel A: Equal-Weighted Industry Returns of SG&A Sorted Portfolios								
Average Returns	*1.45*	1.31	1.72	2.03	2.12	2.55	*1.10***	1.24***
	(4.20)	(5.13)	(6.20)	(6.49)	(6.97)	(7.26)	*(4.28)*	(6.42)
CAPM Alpha	*0.89*	0.81	1.21	1.47	1.57	1.97	*1.08***	1.16***
	(2.82)	(3.39)	(4.69)	(5.22)	(5.70)	(6.23)	*(4.36)*	(6.24)
FF3 Alpha	*0.86*	0.83	1.24	1.53	1.60	2.01	*1.15***	1.18***
	(2.73)	(3.41)	(4.79)	(5.31)	(5.81)	(6.41)	*(4.38)*	(6.32)
Carhart Alpha	*0.94*	0.90	1.29	1.61	1.66	2.05	*1.11***	1.15***
	(2.88)	(3.64)	(4.90)	(5.42)	(5.83)	(6.35)	*(4.17)*	(6.11)
FF5 Alpha	*0.91*	0.91	1.30	1.61	1.72	2.12	*1.21***	1.21***
	(2.83)	(3.70)	(4.91)	(5.53)	(6.06)	(6.58)	*(4.61)*	(6.15)
HXZ Alpha	*0.99*	0.96	1.28	1.66	1.74	2.13	*1.14***	1.17***
	(2.85)	(3.84)	(4.75)	(5.27)	(5.72)	(6.31)	*(3.83)*	(5.72)

Panel B: Value-Weighted Industry Returns of SG&A Sorted Portfolios

	Zero	1 (Low)	2	3	4	5 (High)	Spread (5 - 0)	Spread (5 - 1)
Average Returns	*1.57*	1.41	1.73	2.09	2.26	2.79	*1.22***	1.38***
	(4.83)	(5.88)	(6.72)	(7.11)	(7.84)	(8.27)	*(5.18)*	(7.38)
CAPM Alpha	*1.02*	0.94	1.25	1.56	1.73	2.23	*1.21***	1.29***
	(3.43)	(4.09)	(5.12)	(5.80)	(6.54)	(7.24)	*(5.21)*	(7.17)
FF3 Alpha	*1*	0.95	1.28	1.62	1.76	2.27	*1.27***	1.32***
	(3.38)	(4.12)	(5.24)	(5.89)	(6.62)	(7.42)	*(5.25)*	(7.28)
Carhart Alpha	*1.09*	1.03	1.34	1.70	1.84	2.33	*1.24***	1.30***
	(3.58)	(4.35)	(5.35)	(6.02)	(6.63)	(7.33)	*(5.06)*	(7.12)
FF5 Alpha	*1.05*	1.04	1.35	1.69	1.88	2.37	*1.32***	1.33***
	(3.45)	(4.45)	(5.35)	(6.07)	(6.81)	(7.56)	*(5.49)*	(7.04)
HXZ Alpha	*1.12*	1.09	1.35	1.75	1.93	2.41	*1.29***	1.32***
	(3.47)	(4.58)	(5.19)	(5.85)	(6.55)	(7.28)	*(4.74)*	(6.67)

Table 4

Portfolio Returns Single Sort of Intangible Investments, by Industry break-points

Intangible Investments Quintiles (0.3 * XSGA + XRD)

	Zero	1 (Low)	2	3	4	5 (High)	Spread (5 - 0)	Spread (5 - 1)
Panel A: Equal-Weighted Industry Returns of IIR Sorted Portfolios								
Average Returns	1.45	1.31	1.60	2.01	2.16	2.73	*1.28***	1.42***
	(4.20)	(5.00)	(6.03)	(6.27)	(7.17)	(7.24)	*(4.62)*	(6.49)
CAPM Alpha	0.89	0.80	1.08	1.45	1.61	2.15	*1.26***	1.35***
	(2.82)	(3.28)	(4.46)	(5.00)	(5.91)	(6.24)	*(4.72)*	(6.37)
FF3 Alpha	0.86	0.81	1.10	1.50	1.65	2.21	*1.35***	1.40***
	(2.73)	(3.25)	(4.60)	(5.02)	(6.05)	(6.46)	*(4.80)*	(6.74)
Carhart Alpha	0.94	0.89	1.16	1.56	1.69	2.25	*1.31***	1.36***
	(2.88)	(3.54)	(4.74)	(5.18)	(5.90)	(6.40)	*(4.65)*	(6.57)
FF5 Alpha	0.91	0.87	1.16	1.57	1.78	2.31	*1.40***	1.44***
	(2.83)	(3.46)	(4.74)	(5.31)	(6.28)	(6.61)	*(5.00)*	(6.56)
HXZ Alpha	0.99	0.92	1.16	1.60	1.78	2.33	*1.34***	1.41***
	(2.85)	(3.65)	(4.57)	(5.09)	(5.76)	(6.25)	*(4.17)*	(5.74)
Panel B: Value-Weighted Industry Returns of IIR Sorted Portfolios								
	Zero	1 (Low)	2	3	4	5 (High)	Spread (5 - 0)	Spread (5 - 1)
Average Returns	1.57	1.42	1.64	2.05	2.31	3.00	*1.43***	1.58***
	(4.83)	(5.81)	(6.62)	(6.81)	(7.92)	(8.17)	*(5.46)*	(6.94)
CAPM Alpha	1.02	0.93	1.15	1.52	1.78	2.44	*1.42***	1.51***
	(3.43)	(4.03)	(4.98)	(5.51)	(6.63)	(7.18)	*(5.49)*	(6.74)
FF3 Alpha	1	0.94	1.17	1.57	1.82	2.49	*1.49***	1.55***
	(3.38)	(4.01)	(5.12)	(5.52)	(6.76)	(7.39)	*(5.61)*	(7.11)
Carhart Alpha	1.09	1.03	1.23	1.64	1.88	2.56	*1.47***	1.53***
	(3.58)	(4.30)	(5.27)	(5.69)	(6.58)	(7.31)	*(5.49)*	(6.95)
FF5 Alpha	1.05	1.02	1.24	1.64	1.94	2.60	*1.55***	1.58***
	(3.45)	(4.27)	(5.25)	(5.76)	(6.90)	(7.57)	*(5.85)*	(6.96)
HXZ Alpha	1.12	1.06	1.25	1.68	1.96	2.66	*1.54***	1.60***
	(3.47)	(4.44)	(5.08)	(5.63)	(6.40)	(7.24)	*(5.06)*	(6.36)

Table 5
Portfolio Returns Dependent Sort between SG&A and R&D

SG&A Quintiles	R&D Quintiles					
	1 (Low)	2	3	4	5 (High)	Spread (5 - 1)
Panel A: Equal-Weighted Average Returns of R&D and SG&A Sorted Portfolios						
1 (Low)	1.02	1.29	1.46	1.33	2.39	1.37**
	(4.14)	(4.70)	(4.59)	(3.01)	(2.93)	(2.33)
2	1.45	1.61	1.72	1.76	2.27	0.82**
	(5.41)	(5.86)	(5.31)	(4.78)	(3.64)	(2.21)
3	1.47	1.37	1.82	1.80	2.27	0.80***
	(5.37)	(5.29)	(5.57)	(4.96)	(4.73)	(2.70)
4	1.52	1.65	1.61	1.91	2.50	0.98***
	(5.48)	(5.62)	(5.42)	(5.35)	(5.78)	(2.94)
5 (High)	1.66	1.67	1.81	2.08	2.69	1.03***
	(4.41)	(5.02)	(5.61)	(5.85)	(6.03)	(2.88)
All	1.42	1.52	1.68	1.78	2.42	1.00***
	(5.61)	(5.78)	(5.70)	(5.47)	(6.13)	(4.19)
Panel B: Value-Weighted Average Returns of R&D and SG&A Sorted Portfolios						
1 (Low)	1.10	1.39	1.52	1.40	2.58	1.48***
	(4.82)	(5.28)	(4.97)	(3.31)	(3.29)	(2.64)
2	1.50	1.65	1.71	1.80	2.09	0.59***
	(6.07)	(6.38)	(5.66)	(5.07)	(3.37)	(1.92)
3	1.53	1.45	1.90	1.89	2.44	0.91***
	(5.97)	(6.01)	(6.19)	(5.52)	(5.14)	(2.81)
4	1.67	1.67	1.83	2.04	2.65	0.98***
	(6.25)	(6.29)	(6.47)	(5.93)	(6.26)	(3.01)
5 (High)	1.82	1.89	1.97	2.32	3.00	1.18***
	(4.87)	(6.00)	(6.54)	(6.61)	(6.93)	(3.40)
All	1.52	1.61	1.79	1.89	2.55	1.03***
	(6.25)	(6.52)	(6.36)	(6.02)	(6.68)	(4.41)

SG&A and R&D expenditures are each scaled by long-term assets. Spread is High minus Low portfolio returns. Portfolios are formed by sorting first into (SG&A / Long-term assets) quintiles, then in each quintile, the portfolios are sorted further by (R&D / Long-term assets). "All" reports average returns of (R&D/Long-term asstes) quintiles formed across (SG&A/Long-term asstes) quintiles.

Table 6
Portfolio Returns Dependent Sort between R&D and SG&A

R&D Quintiles	SG&A Quintiles					
	1 (Low)	2	3	4	5 (High)	Spread (5 - 1)
Panel A: Equal-Weighted Average Returns of R&D and SG&A Sorted Portfolios						
1 (Low)	1.02	1.45	1.47	1.52	1.66	0.64**
	(4.14)	(5.41)	(5.37)	(5.48)	(4.41)	(2.47)
2	1.29	1.61	1.37	1.65	1.67	0.38**
	(4.70)	(5.86)	(5.29)	(5.62)	(5.02)	(2.19)
3	1.46	1.72	1.82	1.61	1.81	0.35
	(4.59)	(5.31)	(5.57)	(5.42)	(5.61)	(1.61)
4	1.33	1.76	1.8	1.91	2.08	0.75*
	(3.01)	(4.78)	(4.96)	(5.35)	(5.85)	(1.82)
5 (High)	2.39	2.27	2.27	2.5	2.69	0.30
	(2.93)	(3.64)	(4.73)	(5.78)	(6.03)	(0.27)
All	1.50	1.76	1.75	1.84	1.98	0.48***
	(4.99)	(5.72)	(5.80)	(6.14)	(6.18)	(4.24)
Panel B: Value-Weighted Average Returns of R&D and SG&A Sorted Portfolios						
1 (Low)	1.1	1.5	1.53	1.67	1.82	0.72***
	(4.82)	(6.07)	(5.97)	(6.25)	(4.87)	(2.69)
2	1.39	1.65	1.45	1.67	1.89	0.50***
	(5.28)	(6.38)	(6.01)	(6.29)	(6.00)	(2.79)
3	1.52	1.71	1.9	1.83	1.97	0.45***
	(4.97)	(5.66)	(6.19)	(6.47)	(6.54)	(2.23)
4	1.4	1.8	1.89	2.04	2.32	0.92***
	(3.31)	(5.07)	(5.52)	(5.93)	(6.61)	(2.74)
5 (High)	2.58	2.09	2.44	2.65	3	0.42***
	(3.29)	(3.37)	(5.14)	(6.26)	(6.93)	(0.59)
All	1.48	1.80	1.93	2.07	2.34	0.86***
	(5.54)	(6.07)	(6.42)	(6.85)	(7.11)	(5.15)

R&D and SG&A expenditures are each scaled by long-term assets. Spread is High minus Low portfolio returns. Portfolios are formed by sorting first into (R&D / Long-term assets) quintiles, then in each quintile, the portfolios are sorted further by (SG&A / Long-term assets). "All" reports average returns of (SG&A/Long-term asstes) quintiles formed across (R&D/Long-term asstes) quintiles.

Table 7

Fama-MacBeth Regressions of Firm-Level Returns (1975 - 2019)

Panel A: BM, Size, and Momentum

	B/M	Size	Momentum
	0.153***	-0.001**	0.243
	(-7.65)	(-2.43)	(-0.55)

Panel B: Intangible Investments

IIR	B/M	Size	Momentum
0.313***	0.167***	-0.002	0.259
(4.61)	(8.64)	(-1.41)	(0.58)

Panel C: Research and Development Expenses

R&D	B/M	Size	Momentum
0.846***	0.079***	-0.041	0.141
(4.97)	(9.19)	(-0.47)	(0.67)

Panel D: Selling, General, and Adminstrative Expenses

SG&A	B/M	Size	Momentum
0.093***	0.046***	-0.001	0.314
(3.28)	(8.50)	(-1.05)	(0.71)

Panel E: Intangible Investments

IIR	B/M	Size	Momentum	R&D
0.297**	0.092***	-0.001	0.302	0.516***
(2.01)	(9.23)	(-0.56)	(0.69)	(2.97)

Panel E: Intangible Investments

IIR	B/M	Size	Momentum	SG&A
0.961***	0.522***	-0.084	0.281	0.346*
(3.94)	(9.03)	(-0.74)	(0.66)	(1.81)

Panel F: Intangible Investments

IIR	B/M	Size	Momentum	R&D	SG&A
0.541*	0.404***	-0.017	0.541	-0.004	-0.042
(1.85)	(8.44)	(-0.96)	(0.66)	(0.72)	(0.85)

This table presents Fama-MacBeth monthly regressions from 1975 to 2019. Firms' stock returns are regressed on IIR measure, B/M, Size, and Momentum. Time-series average values of the monthly regression coefficients are reported with time-series t-statistics. The results are controlled by industry. All ICR, XRD, and XSGA are scaled by long-term assets. XRD portion is excluded from XSGA measure.

Table 9A
Industry Sorting bwith Fama-French 5-Industry Classifications

	R&D Quintiles					
	1 (Low)	2	3	4	5 (High)	Spread (5 - 1)
Panel A: Equal-Weighted						
Industry 1	0.99	0.89	1.04	1.20	0.77	-0.22
	(3.79)	(3.03)	(3.39)	(3.14)	(1.59)	(-0.76)
Industry 2	1.11	1.31	1.09	1.17	1.58	0.47*
	(4.03)	(5.13)	(3.56)	(3.23)	(3.46)	(1.65)
Industry 3	0.71	0.95	1.08	1.08	1.27	0.56**
	(2.20)	(2.71)	(2.93)	(2.67)	(2.67)	(2.53)
Industry 4	1.11	0.79	1.12	1.47	1.97	0.86***
	(3.21)	(2.57)	(3.83)	(3.88)	(4.41)	(2.64)
Industry 5	1.78	2.46	3.82	4.48	5.72	3.94***
	(6.54)	(7.71)	(9.43)	(10.20)	(10.53)	(8.34)
Panel B: Value-Weighted						
Industry 1	1.15	1.05	1.27	1.52	1.24	0.09
	(4.84)	(3.71)	(4.39)	(4.03)	(2.52)	(0.04)
Industry 2	1.30	1.45	1.32	1.42	1.89	0.59*
	(4.97)	(5.84)	(4.46)	(3.86)	(4.10)	(1.86)
Industry 3	0.93	1.19	1.30	1.35	1.74	0.81***
	(3.21)	(3.64)	(3.56)	(3.41)	(3.67)	(3.28)
Industry 4	1.56	0.97	1.28	1.83	2.40	0.84**
	(4.68)	(3.41)	(4.89)	(5.02)	(5.40)	(2.53)
Industry 5	1.57	2.34	3.50	4.15	5.65	4.08***
	(6.05)	(7.71)	(9.42)	(10.07)	(9.98)	(7.93)

Table 9B
Industry Sorting bwith Fama-French 5-Industry Classifications

	SG&A Quintiles					
	1 (Low)	2	3	4	5 (High)	Spread (5 - 1)
Panel A: Equal-Weighted						
Industry 1	0.88	1.00	1.04	0.88	0.92	0.04
	(3.00)	(3.72)	(3.85)	(2.84)	(2.59)	(0.13)
Industry 2	1.12	1.16	0.98	1.19	1.37	0.25**
	(4.21)	(4.11)	(3.58)	(3.76)	(4.04)	(1.97)
Industry 3	0.83	1.07	1.08	1.17	1.22	0.39*
	(2.40)	(2.78)	(2.89)	(2.85)	(2.63)	(1.75)
Industry 4	0.96	1.13	1.39	1.54	1.81	0.85***
	(3.13)	(3.47)	(3.80)	(4.20)	(4.41)	(2.93)
Industry 5	1.56	2.93	3.54	4.39	4.99	3.43***
	(5.97)	(8.44)	(8.93)	(10.63)	(11.30)	(9.90)
Panel B: Value-Weighted						
Industry 1	0.95	1.15	1.23	1.13	1.41	0.46**
	(3.47)	(4.64)	(4.92)	(3.83)	(3.92)	(2.08)
Industry 2	1.26	1.28	1.22	1.50	1.75	0.49***
	(4.94)	(4.74)	(4.58)	(4.90)	(5.18)	(2.89)
Industry 3	1.02	1.24	1.35	1.54	1.74	0.72***
	(3.10)	(3.34)	(3.69)	(3.75)	(3.78)	(3.19)
Industry 4	1.24	1.25	1.64	1.87	2.32	1.08***
	(4.36)	(4.22)	(4.85)	(5.22)	(5.69)	(3.93)
Industry 5	1.58	2.74	3.20	4.12	4.83	3.25***
	(6.23)	(8.37)	(8.78)	(10.76)	(11.27)	(9.42)

Table 9C
Industry Sorting bwith Fama-French 5-Industry Classifications

	Intangible Investments Quintiles					
	1 (Low)	2	3	4	5 (High)	Spread (5 - 1)
Panel A: Equal-Weighted						
Industry 1	0.90	0.97	0.85	1.24	0.78	-0.12
	(3.26)	(3.59)	(2.97)	(3.72)	(1.85)	(-0.44)
Industry 2	1.16	1.00	1.03	1.19	1.58	0.42**
	(4.35)	(3.78)	(3.66)	(3.52)	(3.84)	(2.00)
Industry 3	0.71	1.16	0.99	1.14	1.25	0.54**
	(2.13)	(3.21)	(2.72)	(2.78)	(2.62)	(2.15)
Industry 4	0.91	1.01	1.23	1.39	1.92	1.01***
	(2.85)	(3.32)	(3.49)	(4.03)	(4.40)	(3.27)
Industry 5	1.55	2.77	3.66	4.43	5.50	3.95***
	(5.78)	(8.12)	(9.15)	(10.26)	(11.39)	(9.64)
Panel B: Value-Weighted						
Industry 1	1.01	1.13	1.03	1.58	1.33	0.32
	(3.96)	(4.48)	(3.84)	(4.76)	(3.05)	(0.95)
Industry 2	1.30	1.15	1.26	1.50	2.02	0.72***
	(5.11)	(4.46)	(4.66)	(4.43)	(4.77)	(2.71)
Industry 3	0.93	1.30	1.22	1.45	1.78	0.85***
	(3.09)	(3.74)	(3.38)	(3.56)	(3.73)	(3.16)
Industry 4	1.22	1.19	1.51	1.72	2.42	1.20***
	(4.08)	(4.35)	(4.60)	(5.03)	(5.56)	(3.81)
Industry 5	1.53	2.56	3.32	4.25	5.48	3.95***
	(5.90)	(7.99)	(8.99)	(10.13)	(11.04)	(8.96)

Industry 1 (Consumer) includes Consumer Durables, Nondurables, Wholesale, Retail, and Some Services (Laundries, Repair Shops).
Industry 2 (Manufacturing) includes Manufacturing, Energy, and Utilities.
Industry 3 (High-Tech) includes Business Equipment, Telephone and Television Transmission.
Industry 4 (Health) includes Healthcare, Medical Equipment, and Drugs.
Industry 5 (Others) includes Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment, Finance.

The industries' definitions are retrieved from https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_5_ind_port.html.

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