

Intangible Capital, Investor Structure and Stock Return from the Perspective of RBV

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Abstract: The current research suggests the presence of asset mispricing by indicating that stock prices may not necessarily reflect underlying fundamentals. Additionally, prior studies often underestimate the importance and overlook contributions from resources to the returns. In this article, we propose the effect of intangible assets into asset pricing in the context of varying investor sentiment and long-term investment horizon. Drawing from the recourse-based view of intangible assets within firms, we can better assess a firm's growth and stock returns. We conclude that the Capital Asset Pricing Model (CAPM) should incorporate the influence of intangible assets. These assets can reduce operational risk, thus affecting idiosyncratic risk.

Keywords: intangible assets, investor sentiment, long-term investors, stock returns, resource-based view

1. Introduction

In an efficient market, asset prices fully and instantaneously reflect all available information [1]. Therefore, the market price is a fair reflection of the intrinsic value of the stock [2]. In efficient markets, stock prices are generally a good approximation of intrinsic value, with occasional deviations due to factors like new information or market sentiment. As a result, investors cannot achieve abnormal returns through trading or technical analysis.

However, some evidence show that price does not always align with the fair value. Some characteristics of companies, such as market capitalization, book-to-market ratio (B/M), and momentum, have been shown to predict expected stock returns. Some researchers conducted a comprehensive analysis of over 330 predictive return signals (RPS) from 1970 to 2010. Jeremiah Green, John R. M. Hand, X. Frank Zhan [3] argue that newly discovered RPS maintained stable characteristic over time; those RPS with higher average returns shows greater return standard deviations and higher Sharpe ratios. Additionally, their conclusion was that the returns of these RPS were not highly cross-correlated. This suggests that either a general inefficiency in the U.S stock market or that the number of sources of risk contributing to the reasonable priced stock returns far exceeds the level of previously comprehended by theorists. Campbell R. Harvey, Yan Liu, Heqing Zhu [4] argue that at least 316 factors were tested to explain the cross-section of expected returns over the past decade. Scott Richardson, Irem Tuna, Peter Wysocki [5] argue that the investors could enhance their portfolio allocations by referring the information found within general purpose financial

statements. Banz [6] examines the empirical relationship between the total market value of common stock on the New York Stock Exchange and their returns. The research found that smaller firm exhibited higher risk adjusted return compared to larger firms. Fama and French [7] argue the cross-section of average returns on NYSE, Amex, and NASDAQ equities for the years 1963 to 1990 may be adequately explained by two experimentally determined variables: size and book-to-market ratios. According to Jegadeesh and Titman [8], strategies involving buying stocks with a good historical performance and selling those with a poor historical performance in the holding period of 3 to 12 months can generate significant positive returns. Substantial evidence suggests that investors might predict future stock returns by considering certain factors, such as size, book-to-market ratio (B/M), and momentum. Most evidence of asset mispricing suggests that the asset prices deviate from their fundamental values. However, there are two main reasons for such mispricing: (1) prices can either be overvalued or undervalued relative to the true fundamentals (2) the “true” fundamentals may not encompass all the resources associated with stocks, including the intangible asset or organization capital.

The concept of asset mispricing has sparked extensive discussions. Individual investor can influence stock prices through behaviors such as overconfidence, overreaction, risk aversion, potentially creating arbitrage opportunities [9]. However, from a firm’s perspective, many companies outperform their competitors due to unique processes governing its human resources [10]. Organization capital refers to the knowledge or experience possessed by a company’s most important employees, which enhance productivity [11]. These resources are neither measured by companies nor reported to investors. As for intangible assets, their market or fair value is often challenging to observe. The difficulty in valuing intangible assets can result in information asymmetry, leading to potential undervaluation of stock prices by irrational investors.

In this study, we incorporate the resource-based view (RBV) to explain the phenomenon of asset mispricing. Intangible assets within a firm exhibit the four key characteristics of value, rareness, imperfectly mobility and inimitability, which can bolster a firm’s performance and gain a competitive advantage. When intangible assets can be measured accurately, the expected stock return can increase. However, intangible assets are often difficult to measure and are overlooked by irrational investors. Investor sentiment could potentially moderate the relationship between intangible assets and returns. But for long-term investors with informational advantage could benefit corporate decision, consequently exerting a positive influence on stock returns.

This paper extends the existing Capital Asset Pricing Model (CAPM) framework by integrating the resource-based view (RBV). Intangible assets play a vital role within a firm’s resource and significant impact its performance. When assessing a firm’s fundamentals, we must incorporate intangible assets. Intangible assets could reduce a firm’s idiosyncratic risk while enhancing its overall performance. However, due to the inherent challenges associated with valuing the intangible assets, investors may exhibit diverse behavioral bias.

2. Literature Review

Previous research on cross-sectional return analysis has provided evidence suggesting that the market may not perfectly efficient. These finding can be attributed to three key factors. (1) A strong positive correlation between expected return and risk; (2) Accounting measures indicating the presence of information asymmetry; (3) The influence of investor sentiment on stock return.

Firstly, for the stocks with higher idiosyncratic risk or volatility, the investor typically demands for a higher expected return. To compensate for this additional risk, investors usually expect a higher return. Stocks with greater volatility in idiosyncratic return, higher trading costs, and lower ownership by knowledgeable investors are more susceptible to the influence of book-to-market ratio (B/M). Market mispricing causing B/M effects stems from the volatility of arbitrage returns, as the risks

associated with returns hinder arbitrage transactions [12]. The total market variance can be decomposed into two components: average variance and average correlation. Given that the average stock variance is positive, investment portfolios with high idiosyncratic volatility (IV) have lower expected returns compared to the Fama-French (1993) model. Research and development (R&D) expenditures can serve as indicators for the presence of stocks real options [13]. Compared to stock portfolios that have no correlation or minimal correlation with variance risk premium (VRP), portfolios linked significantly to economic uncertainty proxied by VRP exhibit a substantial 8% annualized premium [14].

Secondly, using accounting measure to predict the expected return implies the prevalence of information asymmetry in the market. In the short term, the market may not immediately recognize this inefficiency. However, in the long run, the market will adjust price accordingly. Robert Novy-Marx argues that profitability, as measured by the gross profits-to-assets ratio, can serve as a robust predictor of cross-sectional stock returns. Firms with strong profitability tend to outperform their less profitable counterparts [15]. Investing in a company with research and development capabilities could yield an annual abnormal return of around 11%. However, the market doesn't seem to have appropriately reacted to this company's past research and development capabilities [16]. Aggregate asset growth (AG) has a positive relationship with return momentum. When firms experience an expansion in their total assets, this expansion could serve as a source of momentum profits in stock returns [17].

Thirdly, when the stock is mispriced, the investor sentiment can impact the stock returns. Higher social performance scores are often correlated with lower company returns. Specifically, there's a negative correlation between returns and environmental and community factors. On the other hand, employment indicators show a moderate positive correlation with returns. Investing in least socially desirable stocks can achieve abnormal returns [18]. Compared to stocks with lower arbitrage risk, stocks with higher arbitrage risk typically exhibit higher estimated mispricing. However, if a mispriced stock is exceptionally unique with scarce alternatives, arbitrage (buying undervalued stocks) becomes challenging. Since arbitrageurs, who are typically risk-averse and may not be sufficiently diversified, cannot perfectly hedge against the fundamental risk associated with highly idiosyncratic mispriced stocks, allowing mispricing to persist in the market [19]. Mispricing arises from irrational behavior of investors, which is not easily eliminated through arbitrage activities. Value investing is driven by investor sentiment, whereas momentum investing is negatively impacted by arbitrage limits [20].

In summary, the evidence of asset mispricing can be attributed to three main factors: risk-return compensation, accounting measures associated with information asymmetry and investor sentiment. Some researchers attempt to bridge the gap between efficient markets and asset mispricing by introducing organizational capital into the evaluation of a firm's fundamentals. This approach can help explain the evidence of asset mispricing.

Organization capital represents a company's internal resources, including knowledge, skills, culture, and business process, which can enhance productivity. A higher level of organizational capital could contribute to an increase in Total Factor Productivity (TFP). Organizational capital may have relationship with firm-level risk. Organization capital is embedded within the organization and those intangible assets are prominently featured in financial statements. According to information asymmetry-based theory, in short term, investors tend to underreact to information about organization capital. Due to the inherent difficulty in valuing organization capital, investors may either overprice or underprice the stock. Consequently, investor sentiment plays a significant role in influencing returns.

3. Theory

This study believes that the resource-based view (RBV) can be used to explaining the gap between efficient markets and asset mispricing. Asset mispricing occurs when one or both of the following conditions are met: 1. Investors may either overvalue or undervalue the fundamental of a firm. 2. The true fundamentals may not encompass the intangible assets within the firms. The subsequent section will introduce the resource-based view and elucidate its key characteristics.

3.1. The Resource-Based View

The resource-based view of the firm assumes that a firm can gain a competitive advantage and enhance both its short-term and long-term performance by owning and exploiting valuable and rare resources and capabilities [21]. Competitive advantage refers to superior performance. When a company attains a competitive advantage within the same market, it can generate greater economic value [22]. RBV has four key characteristics: value, rareness, imperfectly mobility and inimitability, each of which can address the issues highlighted in the literature review.

3.1.1. Value

Barney [23] argues that when a company in a particular industry or possesses specific resources and capabilities, it may gain a competitive advantage, thereby enhancing its performance. Thus, the resources and capabilities are valuable. According to the paradigm proposed by Brandenburger and Stuart (1996), businesses can create economic value by generating a positive difference between consumers' willingness to pay and the total cost of producing goods and services. This economic value can be split into two components: economic profit and economic rent. Economic profit can be attributed to the firm's own efforts. Economic rent is captured by the stakeholders who provided the resources and capabilities. Resource-based view (RBV) argues that resources and abilities should be co-specialized as their combination to generate more value than when used individually. Therefore, companies utilize various resources and capabilities to enhance value creation [24].

3.1.2. Rareness

Enhancing a company's competitive advantage primarily depends on the rareness of its combination of resources and capabilities [24]. Several firms within the same industry share valuable resources and capabilities, striving to create positive economic value. However, only one firm's specific combination of resources and capabilities can truly be considered rare, as it generates the highest economic value.

3.1.3. Imperfectly Mobility

A sustained competitive advantage arises when resource is valuable, heterogeneously distributed and imperfectly mobile within the firm. If the resources are perfectly mobile, the competitive advantage becomes temporary because they can change hands.

Therefore, resources can only sustain a competitive advantage when they are valuable, unequally distributed, and not perfectly mobile [25].

3.1.4. Inimitability

According to the resource-based view, if a company's resources and capabilities are difficult to replicate, it can maintain a competitive advantage. As they generate additional economic value, the cost for competitors to replicate them becomes prohibitive [24]. Consequently, successful companies

enjoy a stable competitive advantage relative to competitors when the rivals abandon attempts to adopt their strategies.

A variety of resources are uncertain in their outcomes. Luck can become a pivotal factor in explaining a firm's success. Lucky firm has the ability to learn valuable lesson from failed research and development endeavors, generating higher levels of performance.

In sum, according to the resource-based view, if a company possesses a valuable and rare combination of resources and capabilities that are difficult to replicate and not perfectly mobile, it can attain long-term competitive advantage.

3.2. The Linkage between Resource-Based View (RBV) and Asset Pricing

According to the resource-based view (RBV), if a company possesses valuable, rare resources and capabilities, it has the potential to sustain a competitive advantage. Having a sustained competitive advantage can also lead to a decrease in operational risk. This may be due to the firm's ability to maintain stable operations, command higher prices, or enjoy customer loyalty, all of which can contribute to reduced operational risk. Lower operational risk will be compensated by lower expected return. When a firm have a competitive advantage, it may have higher idiosyncratic volatility, indicating that the firm differs from its peers. This can be used to explain why, compared to the Fama-French (1993) model, the average stock variance exhibits a positive exposure to higher idiosyncratic volatility (IV), resulting in lower expected returns.

3.2.1. Investor Sentiment

For a business, intangible resources such as reputation and unique expertise can provide it with a competitive advantage that is difficult for competitors to replicate. Thus, those intangible assets cannot be recognized in balance sheet. Intangible assets are recognized on the balance sheet if they have been acquired (e.g., through a merger or acquisition). However, internally generated intangible assets, such as research and development costs, are typically expensed as incurred rather than capitalized on the balance sheet. The researchers can neither observe book value nor market or fair value [26]. Those resources attributed to the firm's performance cannot be reflected on the financial statements. This information asymmetry can cause investors to either undervalue or overvalue a firm's fundamentals.

The characteristics of intangible assets is difficult for investors to evaluate. The subject valuation of stocks with characteristics such as low capitalization, younger age, unprofitability, high volatility, lack of dividends, financial distress, or significant growth potential are sensitive to investor sentiment [27]. This sensitivity arises from two reasons. (1) Arbitrage risk: stocks are hard to arbitrage due to high transaction cost, making them costly to buy and sell short. Intangible assets may increase the arbitrage risk. As these mispriced stocks are highly idiosyncratic with scarce close alternatives, arbitrageurs are unable to diversify their holdings to hedge against fundamental risks [19]. (2) Valuation uncertainty: Companies with high uncertainty make investors with difficulties and subjectivity when determining the values. The investors may hold diverse opinions on the valuation, ranging from much too low to much too high. Individual investors with limited knowledge or behavioral bias are reluctant to take short positions, thus overpricing should be more prevalent [28].

3.2.2. Informed Investors

The mispricing phenomenon will eliminate informed traders, including institutional investors, long-term investors, and patient investors. The market will easily be influenced by investor sentiment. To mitigate the asset mispricing, the stock market requires more informed investors to correct asset mispricing.

Long-term investors can benefit corporate decision making. They have the right to prevent financial fraud, accounting misconduct, and managerial earnings manipulation. Additionally, long-term investors can improve innovation efficiency such as patent count, citations, originality. Shareholders can benefit from higher profitability with lower risk [29]. Institutional investors can play a role in correcting mispricing. Institutions tend to buy overvalued stocks with negative ex post abnormal return over a one-year horizon. Institutions also tend to act opposite to normal prescriptions. However, their preference for stocks with poor long-term performance might be institutionally driven, which are generally considered of being smart [30]. Short-term institutional investors play a significant role in providing valuable information in the stock market. Institutional ownership is positively correlated with future stock returns, indicating that investors engaged in short-term investments are more knowledgeable and adept at leveraging informational advantages. They may possess private information related to future earnings [31].

Individual investors with limited knowledge are susceptible to be influenced by investor sentiment. Consequently, the stock market is prone to mispricing with investors overvaluing or undervaluing assets. To address this issue of asset mispricing, the market requires informed investors who can contribute valuable information to enhance market efficiency.

4. Discussion

In the literature review, we have examined evidence that suggests a consistent relationship between cross-section returns analysis and risk-return compensation, accounting measures associated with information asymmetry and investor sentiment. From the perspective of the resource-based view, this study believes that a firm's resource which possess four key characteristics (value, rareness, imperfectly mobility and inimitability), can explain the gap between efficient markets and asset mispricing. While tangible assets are straightforward to comprehend and evaluate, intangible assets are difficult to comprehend and evaluate. Nevertheless, within a firm, intangible assets are of great importance as they significantly contribute to the firm's growth and provide a competitive advantage. According to character-based investing, resources owned by a company can be viewed as characteristics that drive expected returns. The consideration of intangible assets into the analysis can offer insights into predicting expected stock returns.

From a resource-based view, resources can enhance both a firm's short-term and long-term performance [21]. Intangible assets within a firm can improve production efficiency, consequently enhancing the firm's overall performance. However, these assets are often not recognized on the balance sheet and are difficult to determine their book value or fair value [26]. If intangible assets were accurately measured and included on the balance sheet, the true fundamental value of a firm's assets can be reflected in its stock price. Intangible resources can be divided into three types: (1) organizational capital. Operational cost including payroll, education, management team compensation, employee welfare. (2) brand capital. Brand capital plays a pivotal role in building and enhancing a company's reputation. As a result, customers are more inclined to pay a premium for products associated with a reputable brand, thereby increasing the company's economic profit. (3) knowledge capital. Knowledge capital can provide a competitive advantage to a firm as it can be used to develop new products to attract new customers and gain market share [25]. In formal terms,

Proposition 1: Intangible assets that can be accurately measured have the potential to positively influence stock returns.

Since intangible assets are difficult for individual investors with limited knowledge or behavioral bias to evaluate, arbitrage risk and valuation uncertainty can make stock valuation sensitive to investor sentiment [28]. When the investors hold a favorable view of a stock, it can have a positively impact on its returns, whereas when investors hold a negative view of the stock, it can have a negative impact on its returns. In formal terms,

Proposition 2: Investor sentiment can moderate the relationship between intangible assets and returns.

Informed investors, including institutional investors, long-term investors, and patient investors, can mitigate asset mispricing. They are adept at exploiting informational advantage and provide valuable information in the stock market to enhance market efficiency. Long-term investors can benefit corporate decision making, resulting in higher profitability for shareholders [29]. Additionally, they may possess private information about future earnings [31]. In formal terms,

Proposition 3: Informed investors can moderate the relationship between intangible assets and returns.

These three propositions establish a framework for the valuation of intangible assets (see Figure 1).

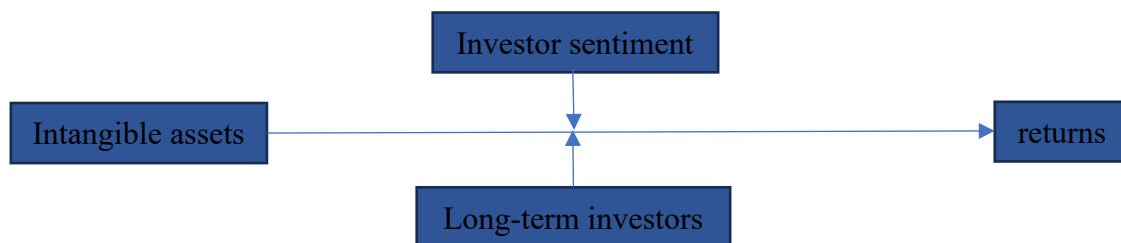


Figure 1: Framework of Valuation of Intangible Assets

5. Conclusion

In an efficient market, the stock prices often reflect all available information about the underlying firm [1]. However, some evidence suggests that certain investors may earn abnormal returns based on predictive returns signals [3]. This mispricing of asset can be attributed to two conditions: (1) prices may be undervalued or overvalued relative to the fundamentals. (2) fundamentals may not contain all the valuable resources of the company.

The introduction of the resource-based view (RBV) can help narrow the gap between efficient market and asset mispricing. According to RBV, the resources possessing four key characteristics (value, rareness, imperfectly mobility and inimitability) can give the company competitive advantage and improve the performance in the short term and long term [21]. Accurate measurement of intangible assets will have a moderating impact on a company's stock returns. When investors lack knowledge, stock valuations could be either overvalued or undervalued. However, long-term investors can exploit valuable information and benefit the corporation decision [29].

This study can help investors construct their investment portfolios. Both long-term and short-term improvements in company performance can be achieved through intangible assets. However, intangible assets are difficult to value and are often overlooked by investors with limited knowledge, leading to the undervaluation of the firm. When investing in a firm with relatively high intangible assets compared to its industry peers, investors may potentially earn abnormal returns in the short term. Sustainable firms with higher intangible asset tend to have lower operational risk and lower idiosyncratic risk. Therefore, investing such companies can help diversify the portfolio.

In the standard asset pricing model, the Capital Asset Pricing Model (CAPM) measures expected return of an asset or a portfolio, determined by risk-free rate plus risk premium based on asset's beta. However, in traditional CAPM, it is assumed that risk and expected returns are constant over time, which may not reflect market dynamics. From the perspective of the RBV, intangible assets could bring about competitive advantages to firms and enhance their performance. Unfortunately, intangible assets are often underrepresented in financial statements and difficult to evaluate. When introducing intangible assets into evaluation, investors with limited knowledge may have behavioral bias.

Nevertheless, for long-term investors, the recognition of intangible assets could play a role in correcting mispricing.

Higher levels of risk are often compensated by higher returns. Unique intangible assets, including knowledge, skills, culture, and business process, can provide a competitive advantage to a firm. This advantage enables the firm to reduce its operational risk, which is a contributing factor to idiosyncratic risk. When intangible assets are integrated into asset pricing, a firm can reduce its idiosyncratic risk.

Long-term investors may positively influence company decisions by enhancing governance and restraining inappropriate managerial behaviors. They can improve the productivity of intangible assets and innovation efficiency. Long-term investors can increase profitability while reducing risk [29].

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