Intellectual Capital and Stock Performance of US High-Tech Acquiring Firms

Cynthia Arthur
University of Denver

Irina Khindanova
University of Denver

This paper examines the impact of intellectual capital on the stock performance of US high-tech acquiring firms between 2010 and 2016. Intellectual capital is characterized as the knowledge that assists companies in creating value and enhancing profitability. The study finds that impacts of intellectual capital on stock performance around the announcement date and in the short run depend on the intellectual capital measure and the industry type. When the overall sample is considered, the VAIC measure indicates that intellectual capital is positively related to stock performance for the 3-year window around the announcement date, while the Tobin's Q measure suggests a negative impact.

Keywords: technological acquisitions, intellectual capital, stock performance, high-tech firms, acquiring firms

INTRODUCTION

This paper examines the impact of intellectual capital on firms' stock performance in technological acquisitions. An analysis is based on the resource-based view (RBV) framework, which conceptualizes a firm as a collection of resources that enables it to compete in its product markets and ultimately determine its value (Testoni, 2022). The RBV of the firm highlights the relevance of maintaining a strategically valuable portfolio of resources for long-term competitive advantage and superior performance (Wernerfelt, 1984). Consistent with this view, the most acknowledged reason that acquirers pursue technological acquisitions is to obtain specific products owned or under development by the target firm (Ranft & Lord, 2000). Technological acquisitions have become a prominent means of complementing the internal and acquired resources of the target firm by successfully leveraging their technological synergies to obtain justifiable competitive advantages (McCarthy & Aalbers, 2016). Acquiring external technological resources is a paramount mechanism by which firms enhance their technical capabilities and products, thereby increasing their market power and achieving strategic regeneration (Graebner et al., 2010). A closely related reason that acquirers undertake technological acquisitions is to gain capabilities embedded in the knowledge of individuals and groups within the acquired company (Graebner & Eisenhardt, 2004; Ranft & Lord, 2000; Graebner, 2004). The resource-based view posits that those resources throughout the firm's governance network influence post-acquisition performance (Popli et al., 2017). The knowledge that high-tech acquirers hope to gain through acquisition is often complex, tacit, and based on accumulated experience, as well as embedded in relationships and ways of communicating among multiple individuals

(Ranft & Lord, 2002). These characteristics amplify the strategic advantage the knowledge can provide (Eisenhardt & Martin, 2000). The short-term goal is gaining access to potential blockbusters, and the long-term goal is acquiring know-how that would enhance the acquirer's growth strategy (Schweizer, 2005). Technological acquisitions are viewed as ways for firms to maintain and upgrade their portfolios of strategically valuable resources. The concept of intellectual capital has recently emerged to describe the organization's strategic intellectual and knowledge-based resources (Schiuma et al., 2007). Intellectual capital refers to intangible resources (resources, capabilities, and competencies) that create firm value (Ashton, 2005) by giving the firm a competitive edge (Stewart, 1997). Intellectual capital is recognized as the most eminent type of capital (World Bank, 2006) in knowledge economies. As the economies develop, the critical step in value creation ascends into an intellectual stairway.

Previous studies (Djamil et al., 2013; Safitri et al., 2024) have established that intellectual capital, although not directly impacting current stock returns, is a key driver of stock return growth. These results suggest that changes in stock returns are predominantly influenced by external factors such as inflation, exchange rate, and socioeconomic conditions. However, intellectual capital affects stock returns through financial performance. The statistical analysis results indicate that indirect influence is greater than the direct influence of intellectual capital on stock returns.

Two papers by do RosÃ & Vaz (2006) and Beattie & Smith (2013) demonstrate that intellectual capital is positively associated with the wealth creation. Zeghal & Maaloul (2010) demonstrate that capital employed remains a central determinant of financial and stock performance, although it has a negative impact on economic performance.

Despite the considerable development of the acquisition's literature, critical issues still need to be solved. A few works focus explicitly on technological acquisitions, intellectual capital, and stock performance. Key issues regarding the poor stock performance of acquiring firms still need to be clarified. Technological acquisitions tend to underperform the stock market in the long run (McCarthy & Aalbers, 2016). To fill the gap in the literature, this study will investigate how intellectual capital may influence the firm's stock performance in technological acquisitions. Introducing intellectual capital as a critical factor in the investigation will help establish the answer to the efficient market anomaly around the firm's stock performance of technological acquisitions.

The research analyzes the technological acquisitions of US companies for the period from 2010 to 2016, highlighting the impact of intellectual capital on the firm's stock performance. The principal contribution of this paper to the existing literature is to refine the concept of intellectual capital using six different measurements. Measuring intellectual capital is particularly important and can be utilized as forewarning signs or indicators that corrective actions are required to enhance the firm's financial position. The information provided from the intellectual capital measures may also allow managers to make strategic plans and track their progress relative to the firms or industry objectives. The paper examines this testable research question, "Under what circumstances does intellectual capital enhance or diminish the stock performance of technological acquisitions?"

The study considers the following intellectual capital measures: Tobin's Q, Economic Value Added (EVA), Value Added Intellectual Coefficient (VAIC), Adjusted Value Added Intellectual Coefficient (A-VAIC), Modified Value Added Intellectual Coefficient (M-VAIC), and Market Value Add (MVA). An analysis of the security price reaction is completed using the event study approach for the entire sample of acquisitions and by industry.

The analysis has established that intellectual capital enhances the overall stock performance of US technological acquisitions around the announcement date, which aligns with prior research by Aminu & Mahmood (2015), Obeidat et al. (2021), and Karchegani et al. (2013). This implies that US-acquiring companies reflect a greater level of gains. Organizations should oversee and strengthen their intellectual capital from a consolidative perspective.

The paper is organized as follows: the second section contains the literature review and the formulation of hypotheses. The third section describes the methodology and data. The fourth section illustrates the analysis and results. The fifth section summarizes the paper.

LITERATURE REVIEW AND HYPOTHESES FORMULATION

This section will discuss the development of hypotheses focusing on how intellectual capital influences the firm's stock performance around the date of technological acquisition announcement and in the short-term period, considering industry type as a moderating factor.

Intellectual Capital and Stock Performance

Intellectual capital has been proposed as a key factor in maintaining organizational survival, competitive strength, and firm performance. Although there needs to be more theoretical debate about the relevance of intellectual capital to many existing companies, there is no agreement on what incorporates this critical concept and how best it can be computed, reported, and empirically tested (Juma & Payne, 2004).

According to the resource-based view (RBV), if all firms within an industry share the same resources, they cannot sustain a competitive advantage (Barney, 1991). If a firm can conceive of and implement strategies to improve its performance, other firms can do the same, as they possess everything in common. Thus, the source of performance for a firm in an industry is to control heterogeneous, intangible, valuable, rare, inimitable, and non-substitutable resources used in implementing a strategy that rival firms are not simultaneously implementing and that is also challenging to duplicate by current or potential competitors (Barney, 1991). Resources are essential antecedents to products and, ultimately, to companies' performance. These resources are perceived as the strength or weakness of a given firm and may consist of tangible and intangible assets conjoined semi-permanently to an establishment (Wernerfelt, 1984).

The resource-based view theory addresses the issue of how to achieve competitive performance in an organization, and it may be used to illustrate the relationship between intellectual capital dimensions and stock performance. If intellectual capital components retained by a company are truly valuable, rare, and inimitable, then the resource-based point of view projection would be that firm performance would likely reflect the value of such resources. Intellectual capital can be viewed as a resource because investment in intellectual capital differentiates the firm from competitors, making it difficult for competitors to imitate its strategic profile. Intellectual capital is perceived as part of the unique resource base emphasized by RBV. They are the fundamental components upon which an organization can build its strategy. Intellectual capital has been identified as a strategic resource for organizations to achieve competitive advantage and superior performance through value creation (Marr et al., 2003; Bayraktaroglu et al., 2019). Therefore, to achieve superior performance, organizations must identify and develop their intellectual capital, utilizing it efficiently (Marr et al., 2003).

Pew Tan et al. (2007) used the Public framework to evaluate 150 publicly listed companies between 2000 and 2002. The study examined the relationship between the four elements of companies' intellectual capital and their stock returns; the findings indicate that intellectual capital and companies' returns are positively correlated. Furthermore, intellectual capital is correlated with future company returns; the growth rate of a company's intellectual capital is positively correlated with the company's performance, and the contribution of intellectual capital to company returns varies by industry. Previous studies have established that intellectual capital is a crucial determinant of firm performance (Shrader & Siegel, 2007; Truong et al., 2023). Some RBV theoreticians argue that critical resources, which are not easily replicated by competitors, may result in firm success (Wernerfelt, 1984), while others suggest that the processes employed by the firm directly impact its performance. Thus, according to the RBV, treating organizational resources within the context of the firm's competitive sphere may impact performance (Wefald et al., 2010).

Amyulianthy and Murni (2015) examined 140 companies in the manufacturing and non-manufacturing industries in 2014 to evaluate the average growth of intellectual capital and firm performance. The results showed that intellectual capital significantly affects firm performance when firm performance is proxied by the Return on Asset (ROA), not by Return on Equity (ROE). Furthermore, the average growth of intellectual capital has a significant impact on firm performance, as measured by ROE and ROA.

Zeghal and Maaloul (2010) analyzed the role of intellectual capital and its effect on stock market performance using 300 companies from 2005 divided into three industries: high-tech, traditional, and

services. The results show that companies' intellectual capital has a positive impact on economic performance. However, the association between intellectual capital and stock market performance is merely significant for high-tech enterprises. The outcomes also demonstrate that capital employed remains a principal determinant of stock market performance, even though it negatively impacts economic performance. The authors considered that the increasing gap between a company's market value and book value could result from the omission of intellectual capital from fiscal statements. This gap generally indicates that investors perceive intellectual capital as a source of value for a company, even though it is not present in its book value. In this context, Chen et al. (2005) suggested that investors place higher value on companies with more intellectual capital if the market is efficient. This assumption is also shared in other studies, including Youndt et al. (2004), who stated that intellectual capital-intensive companies are valued more in the stock market than others. The study by Yalama and Coskun (2007) also noted that, on average, portfolios that use the intellectual capital measure as an input yield higher returns than other portfolios constructed. The study by Bashir (2017) posits that companies must explore more intellectual resources to align the business process capability for superior performance outcomes.

Authors like Zeghal and Maaloul (2010) consider that, from a value creation perspective, investors are more open to companies with greater intellectual capital. On the contrary, some existing studies have also argued that having resources does not make much difference in stock, but rather how managers allocate and deploy resources significantly affects stock performance (Vanacker et al., 2017). Singh et al. (2009) explored the connection between intellectual capital disclosures in initial public offerings and post-issue stock performance. The analysis' central outcome is an adverse relationship between the level of intellectual capital in the IPO prospectus and post-issue stock performance. The negative association persists regardless of industry type, but is more pronounced for small IPOs than for their larger counterparts.

Intellectual Capital and Cumulative Abnormal Returns

Because intellectual capital is unique, it is challenging for competitors to copy, enabling them to produce abnormal returns. Estimating intellectual capital significantly explains firms' equity valuation (Hao, 2016). Yu et al.'s (2009) study employed Ohlson's (1995) valuation benchmark to examine the value relevance of intellectual capital disclosed by information technology (IT) companies. Several significant findings are documented, including the fact that IT companies tend to focus more on human and process capital than on innovation and relational capital; a favorable relationship exists between IT companies' accounting rates of return and the consistency of abnormal returns. A possible reason for this result is that these companies have substantially increased their sales over time; intellectual capital disclosure is relevant to the business valuation of IT companies. More importantly, intellectual capital captures a significant portion of the unexpected returns; using a constant discount rate may be unsuitable for assessing the Ohlson model, as it generates biased abnormal returns that may dilute the value relevance of intellectual capital during the organization's valuation process.

Kim et al. (2021) investigated the stock returns of acquirers of firms holding registered intellectual capital, specifically patents. The authors find that acquiring targets with registered intellectual capital, such as patents, is associated with significantly positive stock performance compared to acquiring targets with non-registered patents. Specifically, acquirers of registered intellectual capital—patents — enjoy higher announcement and interim period abnormal returns. Acquirers of registered intellectual capital - patents also enjoy higher post-acquisition returns, but only in settings where the acquirer's and target's industry are unambiguously close; that is, they share the same SIC code, signifying that when the acquirer has knowledge and proficiency in that industry, the acquirer can exploit the target firm's patents better. Furthermore, the study concluded that the degree of an acquirer's revolution may be critical to their post-acquisition stock performance; those acquirers holding at least one patent of their own prior to the acquisition enjoy significantly higher post-acquisition abnormal returns, and this advantage is not contingent on the registered patents of the target firm.

Paradesia et al. (2016) study examined the effect of intellectual capital on abnormal stock returns. The abnormal stock return was measured by cumulative abnormal return (CAR) and average abnormal return (AAR); the study sample covered data from 2011 to 2015. The results showed that significant intellectual

capital has a positive and significant effect on the abnormal stock return, as measured by CAR and AAR. Overall, this research found that structural capital contributes the most to creating value for the company. Dumay & Tull's (2007) study showed that, by using the event study methodology for the 2004 to 2005 fiscal year, the elements of intellectual capital are employed to categorize price-sensitive organization information and to investigate any affinity between the disclosure of intellectual capital and the incremental abnormal return of a company's share price. They also concluded that the disclosure of intellectual capital elements in price-sensitive company announcements could affect the cumulative abnormal return of a company's share price over a period of time.

Hemmati and Zamani (2011) examined the relationship between intellectual capital, value-added, and cumulative abnormal returns. They concluded that as firms' intellectual capital increases, the value added of the capital also increases, while their cumulative abnormal returns decrease. Another study by Arthur and Khindanova (2023) shows that acquirers' abnormal returns tend to dissipate over the three-year horizon. Kohers and Kohers (2001) demonstrate that investors tend to be overly confident about the future performance of acquirers in high-tech takeovers, particularly when the acquirer is a well-known and reputable company. Companies that engage in acquisitions tend to perform poorly in the post-acquisition period, and their long-run abnormal returns are generally negative (Loughran & Vijh, 1997; Rau & Vermaelen, 1998; Malmendier & Tate, 2008; Kohers & Kohers, 2001).

The literature review above suggests different views on intellectual capital and stock (cumulative abnormal returns) performance in technological acquisitions. Combining these constructs with the RBV Theory suggests that intellectual capital will be associated with superior stock performance. Thus, the following hypotheses:

Hypothesis 1: *Intellectual capital improves stock performance around the announcement date in technological acquisitions.*

Hypothesis 2: *Intellectual capital improves the short-run stock performance in technological acquisitions.*

Moderating Condition of Industry Type

Companies in diverse industries encounter unique external environmental conditions and internal contingencies. Because of this, different junctions must be emphasized to achieve organizational success. Research conducted by economists has long suggested the impact of specific industry structural characteristics on both individual firms and overall industry performance levels. For example, industry type explained 10 percent of the average variance of stock returns, and the relative significance of functioning areas differs by industry type (Hitt et al., 1982). Additionally, a relationship exists between long-range planning and economic performance that varies across firms in different industries (Hitt et al., 1982). The differences in structural characteristics among various industries account for a portion of the variance in business unit performance, and an industry's structural characteristics determine certain firms' critical success factors.

Industrial organization situates the determinants of firm performance with the firm's conduct. This may also be the premise of RBV of the firm (Barney, 1991; Wernerfelt, 1984). Several studies have been conducted to provide empirical evidence for the relative importance of the industry type in determining firm performance. Some existing studies have shown that no firm effects exist, while industry effects account for the variance in industry rates of return on resources (Adetunji & Owolabi, 2016). The importance of considering industry type as a significant determinant of firm-level performance is well recognized, and both industry effects and firm characteristics have a substantial influence on growth and profitability dimensions (Shergill & Sarkaria, 1999). Some extant studies draw on the research paradigm of relevant scholars to further examine the moderating effect of industry type, for instance, high-tech and non-high-tech industries (Daradkeh, 2023). It is expected that the higher the industry concentration, the less competition there is in the industry; therefore, firms controlling the industry are more likely to have superior performance. It can also be argued that the industry to which a firm belongs will affect its performance (Adetunji & Owolabi, 2016).

The moderating effect of industry type may improve performance (Shouyu, 2017). Because firms tend to compete within industries, the long-held belief is that industries have become constraining forces within which firms adapt or perish. The role of industry structure has been shown to affect firms in their management of licensing activities, strategic decisions made by firms in regulated and unregulated firms within the same industry, the decision to internationalize firm's economizing behaviors, product versus market growth decisions, risk reduction factors organizational learning orientations and in the growth of firms in emerging economies. Furthermore, the resources used within a specific industry can be utilized to assess the success of certain competitive firm activities (Wefald et al., 2010). Because intellectual capital also exhibits a multifaceted performance in different industries, it may behave differently in various environments. For example, the implementation of intellectual capital may also be resisted, including internal corporate and market boycotts, so the impact on firm performance will likely not be affected.

In a stable competitive environment, the industry's principals hardly revolutionize first to destroy the existing environment; however, to cultivate the market and pave the way for new products to be launched steadily. In a dynamic environment, intellectual capital plays a decisive role in stock performance, and in a dynamic industry, change is the norm. The dynamic climate allows new entrants to the industry to gain growth and profits (Shouyu, 2017). The rapid technological change over the last three decades, the condensed product life cycles, globalization, and the blurring of industry boundaries have made the business environments progressively dynamic. Therefore, industry executives must have the capabilities to help address dynamic settings. Intellectual capital is a crucial engine for firms to adapt to and shape the climate in which they operate, serving as a mechanism that influences their capabilities. Industries operating in a dynamic environment may develop new products that secure their competitive advantages, and exploiting these opportunities may require businesses to be equipped with robust capabilities and continuous modernization (Helfat & Raubitschek, 2018).

Some studies have shown that the relationship between intellectual capital and stock performance is not direct, as it is influenced by the impact of the competitive environment, and that the relationship among these attributes may be flexible. It may be influenced by internal and external market conditions and environmental factors. In a stable environment, change may not be an attractive venture within a specific industry; hence, an industry's strategies may negatively impact its stock performance and may also differ by industry (Singh et al., 2009; Hemmati & Zamani, 2011; Pew Tan et al., 2007).

Intellectual capital is likely beneficial if the industry is willing to adapt to the existing state. Companies adhering to current standards or norms push innovative firms into adverse competitive positions. The structure's inflexibility and companies' inaction may also suppress such activities and affect the entire industry (Shouyu, 2017).

A comprehensive treatment of the effects of industry type on corporate performance has been provided by Porter (1980), where he proposed that an industry's structure enormously impacts the kinds of strategies available to the company and the reason why external forces influence all companies within a particular enterprise, organizational effectiveness may be an effect of the company's ability to cope with these pervasive forces. Therefore, Porter suggests that various functional areas are crucial in implementing strategies within a particular industry. The literature indicates a relationship between certain critical industry-type functional areas and firm performance, which may moderate this relationship (Hitt et al., 1982). Industries configuring their resources through intellectual capital should be associated with improved stock performance. Thus, the positive relationship between intellectual capital and stock performance is moderated by industry type in the context of technological acquisitions, both around the announcement date and during the post-acquisition period.

The evidence above suggests different views on the moderation effect of industry type on intellectual capital and stock performance in technological acquisitions. This paper suggests the following hypotheses:

Hypothesis 3: *The positive relationship between intellectual capital and stock performance around the announcement date is moderated by industry type in technological acquisitions.*

Hypothesis 4: *The positive relationship between intellectual capital and short-run stock performance is moderated by industry type in technological acquisitions.*

METHODOLOGY AND DATA

The study examines the impact of intellectual capital on US-acquiring firms' stock performance in technological acquisition. The research techniques for the study will be event study methodology and regression analysis. This section discusses the event study methodology and the dependent, independent, and control variables. In addition, this section will discuss the sample selection and data sources.

An event study is the standard method for calculating the security price reaction to an event. Additionally, it provides a clear picture of the speed at which prices adjust to new information. The event study methodology is employed to examine security price behavior in the vicinity of specific events. It is the standard method of measuring security price reactions to announcements or events. This approach predates the researchers' ability to accurately pinpoint the information event under investigation (Liargovas & Repousis, 2011). The analysis will be grouped around the announcement date and post-acquisition periods for the acquirers in high-tech industries. The market's response to the acquisition will be estimated utilizing the daily stock return data to derive the abnormal stock returns, and this assumes market efficiency, in that share prices respond impartially and judiciously, and the degree of the gain mirrors the firm in the imminent periods (Malkiel & Fama, 1970; Roberts, 1967).

Cumulative abnormal returns (CARs) are calculated following the definition and the formula in Arthur and Khindanova (2023). The high-tech industry sphere is distinguished by industries that have elevated strengths in Science, Technology, Engineering, and mathematics (STEM) professions (Wolf & Terrell, 2016). The short run analysis evaluates the 24-day CARs after the acquisition completion date.

The paper considers six measures of intellectual capital: Tobin's Q, Economic Value Added (EVA), Value Added Intellectual Coefficient (VAIC), Adjusted Value Added Intellectual Coefficient (A-VAIC), Modified Value Added Intellectual Coefficient (M-VAIC), and Market Value Add (MVA). They are calculated using the following formulas:

- Tobin's Q = (Market Value of Equity + Book Value of Liability)/Book Value of Total Assets (Wang, M. C. (2013).
- VAIC = ICE + CEE or HCE + SCE + CEE, where CEE = VA/CE, HCE = VA/HC, SCE = SC/VA, VA = Operating Profit + Depreciation + Amortization + Employees' Salaries and Wages, CE = Total Assets - Total Liabilities, HC is Employees' Salaries and Wages (Xu & Liu, 2020).
- M-VAIC = HCE + SCE + RCE + CEE, where CEE = VA/CE, HCE = VA/HC, SCE = SC/VA, RCE=RC/VA, VA = Operating Profit + Depreciation + Amortization + Employees' Salaries and Wages, CE = Total Assets - Total Liabilities, HC is Employees' Salaries and Wages, RC = Marketing Cost (Ulum et al., 2014).
- A-VAIC = HCE + INVCE + CEE, where VA = NI + LC + I + T + DP + R&D,

NI is Net Income, LC is Labor Cost, I is Interest, T is Taxes, DP is Depreciation and Amortization, and R&D is Research and Development. HCE = VA/HC. INVCE = VA/INVC. Innovation Capital (INVC) is represented by R&D Investment and Copyrights. CEE = VA/CE, and CE is the Book Value of Total Assets (Nadeem et al., 2019).

- EVA = Net Sales - Operating Expenses - Taxes - Capital Charge (Chen et al., 2004).
- MVA = Firm's Market Value – Equity Book Value (Obeidat et al., 2021).

The control variables, which have the potential to influence stock performance, will consist of the value of the acquisition deal, spending on research and development (R&D), size of the acquirer, and gross domestic product (GDP) growth rate (Dynan & Sheiner, 2018; Arthur & Khindanova, 2023; Rehman et al., 2022).

The empirical model for analyzing the firm's stock performance around the announcement date and post-acquisition period will take the following general form:

$$CAR_{i,k,l} = \alpha + \beta_1 ICM_i + \beta_2 SACQ_i + \beta_3 RDSP_i + \beta_4 ACQD_i + \beta_5 GDP_i + \beta_6 ICM_i * HTIND + \varepsilon_i \quad (1)$$

In this equation, $CAR_{i,k,l}$ represents the cumulative abnormal return around the announcement dates for acquirer *i* during the event periods *k,l* (k = −1 and l = +*1*, k = −3 and *l* = +3, *i* =1, …N; α is an intercept coefficient. ICM_i is the value of acquirer i's intellectual measure. $RDSP_i$ is the value of the acquirer*'s* research and development expenses/sales. $SACQ_i$ is the size of the acquirer. $VACQD_i$ is the value of the acquisition deal, and $GDPGR_i$ is the gross domestic product (GDP) growth rate. ICM_i * *HTIND* is the moderating condition of intellectual capital measure and high-tech industry type, ε_i is an error term.

The sample for the study includes technological acquisition data from 2010 to 2016. Acquisitions are identified as US High-Tech acquisitions if an acquirer and a target have high-tech three-digit SIC codes (for example, 283 – Drugs; 367 - Electronic Components and Accessories, 382 - Laboratory, Optic, Measure, Control Instruments; 384 - Surgical, Medical, Dental Instruments) described in the study by Kile and Phillips (2009). The authors attributed firms to a suitable category established on the firms' business characterization disclosures and utilized industry classification to evaluate how effectively distinct SIC codes identify high-tech firms. The data will be categorized into three parts to assess the impact of intellectual capital on the firm's stock performance (pre-acquisition, announcement, and post-acquisition periods).

The stock price information is obtained from the Electronic Data Gathering, Analysis, and Retrieval System (EDGAR), the Center for Research in Security Prices (CRSP), and Compustat, via the Wharton Research Data Services (WRDS) platform, for the periods 2010 through 2016. The acquisition information, including company names, announcement and completion dates, deal values, and SIC codes, is sourced from the Zephyr database. The following criteria for pulling the acquisition-specific data are used:

- The transaction amount must be $1 million or greater for a deal to qualify for inclusion in the sample.
- The acquirer ought to be publicly traded and domiciled in the US.
- The target ought to be publicly traded and domiciled within the US.
- Acquiring companies must fall under the high-tech industries classification SIC codes.
- The acquirers' final stake in the target must be equal to or greater than 51 percent.
- The deal must be denoted as completed and confirmed.

262 acquisitions met the selection criteria. Table 1 below provides a breakdown of industries and their respective numbers of deals. Computer programming had the highest number of deals - 95. It was followed by surgical, medical, and dental instruments, with 41 deals. The drug industry had 31 total deals. The deal value ranges from $1 million to $130 million, and the acquirer size varies from $0.3 million to $354.4 million. Tobin's Q changes from $ 0.47 to $1422.3. EVA values are between -$ 330.17 million and $313 million. VAIC fluctuates from -$1203.1 million to $ 3.344 million. M-VAIC varies from -$1203.1 million to $6.796 million. A-VAIC ranges from -9325.5 million to $ 127.6 million. MVA values are from -$93.8 million to $138 million. The R&D expenses to sales ratio move from 0 to 30.7%. The lowest GDP growth rate is 3.63%, while the highest rate is 4.20%. The statistics of the explanatory variables by industry are available upon request.

TABLE 1
ANALYZED HIGH-TECH INDUSTRIES

SIC Code	Industry Description	Number of Deals
283	Drugs	31
355	Special Industry Machinery	3
356	General Industry Machinery and Equipment	1
357	Computer and Office Equipment	13
362	Electrical Industrial Apparatus	1
364	Electric Lighting, Wiring Equipment	1
366	Communication Equipment	16
367	Electronic Components and Accessories	25
382	Laboratory, Optic, Measure, Control Instruments	18
384	Surgical, Medical, Dental Instruments	41
482	Miscellaneous Communication Services	3
489	Communication Services, NEC	6
737	Computer Programming, Data Processing	95
873	Research, Development, and Testing Services	8
		262

The correlation coefficients for all the independent variables in the study are shown in Table 2.

TABLE 2
CORRELATION MATRIX FOR INDEPENDENT VARIABLES

	Tobin's Q	EVA	VAIC	MVAIC	AVAIC	MVA
Tobin's Q	1.0000					
EVA	-0.0303	1.0000				
VAIC	-0.9939*	0.0284	1.0000			
MVAIC	-0.9939*	0.0285	1.0000*	1.000		
AVAIC	-0.9213*	0.0217	0.9559*	0.9559*	1.000	
MVA	-0.0470	0.0223	0.0412	0.0412	0.0164	1.000

Note: The symbols *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

The correlation coefficient between VAIC and MVAIC is positive 1, indicating a functional relationship. Also, VAIC had a strong positive correlation coefficient with AVAIC and MVAIC of 0.9559. There was a very low correlation between VAIC & MVA, MVAIC & MVA, and AVAIC & MVA. Tobin's Q, on the other hand, had a negative correlation coefficient with VAIC, MVAIC, and AVAIC of -0.9939, -0.9939, and 0.9213, respectively, indicating a strong negative relationship. There was a low negative relationship between Tobin's Q and MVA. In the case of EVA, there was a low correlation with VAIC, MVAIC, AVAIC, and MVA. Because of the high correlation among VAIC, MVAIC, and AVAIC, the impacts of these indicators of intellectual capital on stock performance are similar.

RESULTS AND DISCUSSION

This section presents the results of a performance analysis conducted around the announcement date and following the acquisition completion date. The sample comprises 262 US high-tech firms that engaged in technological acquisitions of US high-tech targets between 2010 and 2016. The cumulative abnormal return (CAR) around the event day was calculated using the market model. The CARs for US companies' technological acquisition activities were calculated for three windows: [-1 to +1], [-3 to +3], and [+24] - one month after acquisition completion.

Table 3 shows derived CAR values. The t-statistics of CARs *around the announcement date* indicate that CAR values are statistically insignificant, except the Electronic Components and Accessories. The announcement of technological acquisitions by US firms does not impact its stock performance over the specified event windows. This is consistent with a study by Sirower (1994). An acquirer has an insignificant abnormal return if its bid activity has been dormant for less than a year and may earn a positive abnormal return if it has been inactive for over a year. Leeth and Borg (2000) achieved positive cumulative abnormal returns in their study on US acquisitions. However, studies by Frank et al. (1991) and Healy et al. (1992) demonstrate that the US had a negative cumulative abnormal return around the announcement date.

For three days around the announcement date (i.e., W1: [-1, +1]), Laboratory, Optic, Measure, Control Instruments, Surgical, Medical, Dental Instruments, Research, Development, Testing Services, and Combined industries (Special Industry Machinery, General Industry Machinery and Equipment, Electrical Industrial Apparatus, Electric Lighting, Wiring Equipment, Miscellaneous Communication Services, and Communication Services, NEC) acquiring firms' stocks gained statistically insignificant positive CARs. It appears that acquirers in these industries overperformed over the three-day periods around the announcement date. The Electronic Components and Accessories industry displayed a statistically insignificant negative CAR, indicating that acquirers in this industry underperformed over the three-day periods surrounding the announcement date.

In a seven-day period around the announcement (i.e., W2: [-3, +3]), the Electronic Components and Accessories industry has a significantly negative average CAR, implying that this industries' stocks underperformed expected returns. The acquiring firms' stocks in three industries showed positive outcomes: Laboratory, Optic, Measure, and Control Instruments; Surgical, Medical, and Dental Instruments; and Computer Equipment.

A post-acquisition completion analysis of stock performance over the 1-month period (24 trading days) produced a statistically significant negative CAR of -0.0035% for the overall sample. This is consistent with a study by Walker (2000). An acquirer has a significantly negative abnormal return if shareholder losses are primarily limited to those acquisitions based on diversification strategies, particularly when the acquiring firm cites potential overlap with its existing operations.

The CAR 24 days after the acquisition completion date [+24] showed that drugs-acquiring firms' stocks had a negative, significant outcome, whereas Computer and Office Equipment, Computer Equipment, Electronic Components and Accessories, and Computer Programming and Data Processing displayed statistically insignificant negative values. In the short term, technological acquisitions by US firms yield returns below expectations.

Hypothesis 1 proposed that intellectual capital improves stock performance in technological acquisitions around the announcement date. This study assumes that intellectual capital is a crucial factor for organizational survival and maintaining competitive strength, as companies with higher intellectual capital have a competitive advantage. The paper presents regression results with four measures of intellectual capital: Tobin's Q, EVA, VAIC, and MVA. An analysis of the influence of these intellectual capital proxies and other factors on CARs around the announcement dates is based on regressions of the overall sample.

TABLE 3
CUMULATIVE ABNORMAL RETURNS

SIC Code	Industry	N	CAR	[-1,+1]	[-3,+3]	[+24]
	Overall	262	AVG, %	0.2574	-0.3800	-0.0035***
			T-Stats	0.5183	-0.7264	-2.37
283	Drugs	31	AVG, %	0.0125	-0.0030	-0.0125***
			T-Stats	0.9287	-0.1939	-2.1592
357	Computer and Office Equipment	13	AVG, %	-0.0322	-0.0204	-0.0036
			T-Stats	-1.2518	-0.6410	-1.0360
366	Computer Equipment	16	AVG, %	0.0057	0.0064	-0.0105
			T-Stats	0.1885	0.2317	-1.0603
367	Electronic Components and Accessories	25	AVG, %	-0.9573	-2.5443**	-0.0021
			T-Stats	-0.8058	-1.7485	-0.6936
382	Laboratory, Optic, Measure, Control Instruments	18	AVG, %	1.6113	1.4829	-0.0005
			T-Stats	1.0694	0.7858	-0.11667
384	Surgical, Medical, Dental Instruments	41	AVG, %	0.8551	0.7659	0.0004
			T-Stats	0.8299	0.6985	0.1648
737	Computer Programming, Data Processing	95	AVG, %	-0.0051	-0.0093	-0.0026
			T-Stats	-0.6026	-1.0448	-0.9836
873	Research, Development, and Testing Services	8	AVG, %	3.9916	-1.9044	-0.0055
			T-Stats	1.2768	-0.8046	-0.91842

Table 4 illustrates the impacts of intellectual capital on stock performance around the announcement date for the overall sample. T-statistics are based on the robust standard errors. The R-Square value for all the regression results varies from 0.68 to 0.86, which is moderate enough not to cause concern regarding the goodness of fit. Tobin's Q coefficient for CAR [-1, +1] has a statistically significant negative value, implying that intellectual capital negatively impacts stock performance in the 3-day period around the announcement date. In the [-3, +3] window, Tobin's Q had a statistically insignificant coefficient. In contrast, the VAIC coefficient is statistically significant at the 0.05 level, suggesting that intellectual capital has a positive impact on stock performance in the 3-day period surrounding the announcement date. Regressions with the M-VAIC and A-VAIC indicators also yielded positive impacts of intellectual capital on stock performance near the announcement date.

Regressions for the EVA and MVA measures of intellectual capital yielded statistically insignificant coefficients for both windows around the announcement date. Thus, EVA and MVA do not demonstrate the impacts of intellectual capital on stock performance around the announcement date.

In all regressions for six intellectual capital indicators, the mean-variance inflation factor (VIF) was less than 10. Hence, the analysis is not prone to multicollinearity problems.

TABLE 4
IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE AROUND THE ANNOUNCEMENT DATE. OVERALL SAMPLE

Variable	Tobin's Q		VAIC	
	[-1, +1]	[-3, +3]	[-1, +1]	[-3, +3]
Intellectual Capital Indicator	-.00002	.00002	.00002	-.00003
	(-1.67)*	(1.34)	(1.78)*	(-1.33)
R&D Expenses to Sales Ratio	.0015	-.0048	.0015	-.0048
	(1.29)	(-6.66)***	(1.28)	(-6.66)***
LN (Acquirer Size)	-.0035	.0013	-.0035	.0013
	(-2.06)**	(1.07)	(-2.06)**	(1.04)
LN (Deal Value)	.0011	.0005	.0011	.00046
	(0.71)	(0.38)	(0.71)	(0.39)
GDP Growth Rate	-.0119	.0009	-.0118	.0007
	(-0.98)	(0.12)	(-0.98)	(0.10)
Constant	.0722	-.01988	.0720	-.0191
	(1.61)*	(-0.71	(1.62)	(-0.68)
R^2	0.68	0.86	0.68	0.86

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

Evaluations of the influence of intellectual capital on stock performance around the announcement date depend on the specific intellectual capital measure. However, it is definite that intellectual capital has an impact on stock performance over a 3-day window around the announcement date. The coefficient of intellectual capital (VAIC) for the overall sample over the [-1,+1] window around the announcement date is positive and significant, while the coefficient of intellectual capital (Tobin's Q) is negative and significant. The VAIC result supports Hypothesis 1 and validates the prediction that intellectual capital is positively related to stock performance and aligns with a similar theoretical rationale posited by Diyanty et al. (2019), Marzo and Bonnini (2018), and Soewarno & Tjahjadi (2020) argued the intellectual capital positively affects stock or market performance. The study by Marzo and Bonnini (2018) showed that the impact of intellectual capital on stock performance tends to have a positive result and a significant overall association.

Hypothesis 2 posits that intellectual capital positively enhances *short-term stock performance* in technological acquisitions. The prior fiscal year closest to the acquisition completion date is utilized for the regression analysis data. Regressions on the overall sample produce statistically insignificant coefficients of all six indicators of intellectual capital (Tobin's Q, EVA, VAIC, M-VAIC, A-VAIC, and MVA) for the window CAR [+24]. It appears that intellectual capital does not impact stock performance over the 1-month period after the acquisition completion of high-tech companies.

These findings, which are of crucial interest to the field, have implications for understanding the relationship between intellectual capital and stock performance in technological acquisitions. The regression results do not fully support the suggestion of Hypothesis 2 that intellectual capital has a positive

impact on the short-term stock performance in technological acquisitions. The paper's results are consistent with those documented in previous studies by Marzo and Bonnini (2018), Singh et al. (2009), and Hadyan and Makaliwe (2021). Marzo and Bonnini (2018) argue that market value and other financial metrics show an insignificant association with intellectual capital, as measured by VAIC. Research conducted by Hadyan and Makaliwe (2021) indicates that intellectual capital, as measured by the A-VAIC, does not influence returns. Zeghal and Maaloul (2010) note that the association between intellectual capital and stock market performance is only marginally significant for high-tech enterprises. Furthermore, there appears to be a negative correlation between the level of intellectual capital and stock performance. This negative relationship persists across various industries but is more pronounced in smaller companies compared to larger ones.

Hypothesis 3 of the study posits that industries that configure their resources through intellectual capital achieve a competitive advantage, which may be associated with improved stock performance on the day of the acquisition announcement. Therefore, the positive relationship between intellectual capital and stock performance around the announcement date is moderated by industry type. Tables 5 to 8 present regression results on the impacts of intellectual capital on the short-run stock performance by industry.

TABLE 5
IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE AROUND THE ANNOUNCEMENT DATE. ELECTRONIC COMPONENTS AND ACCESSORIES INDUSTRY

Variable	Tobin's Q		VAIC		MVA	
	[-1, +1]	[-3, +3]	[-1, +1]	[-3, +3]	[-1, +1]	[-3, +3]
Intellectual Capital Indicator	.0195	-.01650	-.0574	.0446	.0041	-.0041
	(3.21)***	(-8.99)***	(-4.00)***	(9.96)***	(1.87)*	(-3.26)***
R&D Expenses to Sales Ratio	.0563	-.0161	.1105	-.0602	.0512	-.0088
	(0.69)	(-0.42)	(1.53)	(-1.89)*	(0.58)	(-0.18)
LN (Acquirer Size)	-.0110	.00671	-.0064	.0030	-.0068	.0035
	(-1.41)	(1.74)*	(-0.95)	(0.74)	(-0.91)	(0.82)
LN (Deal Value)	.0094	-.0033	.0103	-.0041	.0084	-.0020
	(1.18)	(-0.84)	(1.40)	(-1.02)	(1.13)	(-0.49)
GDP Growth Rate	-.0538	.0146	-.0562	.0190	-.0590	.0177
	(-1.35)	(0.65)	(-1.57)	(0.97)	(-1.49)	(0.83)
Constant	.2023	-.0655	.2651	-.1242	.2258	-.0865
	(1.36)	(-0.75)	(1.95)*	(-1.65)*	(1.57)	(-1.04)
R^2	0.70	0.93	0.74	0.94	0.67	0.91

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5 shows the results for the Electronic Components and Accessories Industry. The industry had 25 acquisitions over the 2010-2016 period. The R-Square value varies from 0.67 to 0.94, which is high enough not to cause concern regarding the goodness of fit. Tobin's Q coefficient for CAR [-1, +1] is positively statistically significant, and for CAR [-3,+3] - negatively statistically significant. The VAIC coefficient has opposite signs: negative for the [+1, -1] window and positive for the [-3, +3] window. As shown in Table 5, the M-VAIC and A-VAIC coefficients have the same signs as the VAIC coefficient, while the MVA coefficients have the same signs as Tobin's Q coefficient. All Tobin's Q, VAIC, M-VAIC, A-VAIC, and MVA coefficients are statistically significant for the [-1,+1] and [-3,+3] windows. However, the EVA coefficients are statistically insignificant. The Electronic Components and Accessories Industry's mean-variance inflation factor (VIF) for all regression outcomes is below 10. Hence, the analysis has no multicollinearity problem. The White test (White, 1980) was utilized to see whether there was

heteroscedasticity in the residuals. The null hypothesis is that there is no heteroskedasticity. The probability value of the chi-square statistics was above 0.1. This means that the null hypothesis cannot be rejected.

Tobin's Q and MVA measures suggest that intellectual capital has a positive impact on the stock performance of acquirers in the Electronic Components and Accessories industry over the 3-day period surrounding the announcement date, but it has a negative impact on stock performance over the wider 7-day period. The VAIC, M-VAIC, and A-VAIC measures yield opposite conclusions: intellectual capital has a negative impact on the stock performance of acquirers in the Electronic Components and Accessories industry over the 3-day period surrounding the announcement date. However, intellectual capital affects stock performance positively over the wider 7-day period. Similar to the conclusions of the overall sample analysis, evaluations of the influence of intellectual capital on the stock performance of acquirers in the Electronic Components and Accessories industry around the announcement date vary depending on the chosen intellectual capital measure. Also, the impact of intellectual capital on stock performance around the announcement date is certain.

TABLE 6
IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE AROUND THE ANNOUNCEMENT DATE. SURGICAL, MEDICAL, DENTAL INSTRUMENTS INDUSTRY

Variable	[-1, +1]	[-3, +3]
MVA	-.0029	.0049
	(-1.28)	(2.18)**
R&D Expenses to Sales Ratio	-.0239	-.0026
	(-1.62)*	(-0.23)
LN (Acquirer Size)	.0004	-.0049
	(0.13)	(-1.89)*
LN (Deal Value)	-.0033	.0066
	(-0.99)	(2.34)**
GDP Growth Rate	.0095	-.0165
	(0.44)	(-1.03)
Constant	-.0108	.0502
	(-0.13)	(0.79)
R^2	0.87	0.92

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6 presents the results for the Surgical, Medical, and Dental Instruments industry, which underwent 41 acquisitions during the analyzed period of 2010-2016. The R-Square values of 0.87 and 0.92 indicate high goodness of fit. The MVA coefficient for CAR [-1, +1] is statistically insignificant, although it is positively statistically significant for CAR [-3, +3]. However, the coefficients for Tobin's Q, EVA, VAIC, A-VAIC, and M-VAIC are statistically insignificant for both [-1, +1] and [-3, +3] windows. The mean-variance inflation factor (VIF) for all regressions in the Surgical, Medical, and Dental Instruments industry is below 10. Hence, the analysis has no multicollinearity problem. The White test (White, 1980) showed no heteroskedasticity. Based on the MVA measure, intellectual capital positively impacts stock performance around the announcement day over the 7-day period.

TABLE 7
IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE AROUND THE ANNOUNCEMENT DATE. LABORATORY, OPTIC, MEASURE, CONTROL INSTRUMENTS INDUSTRY

Variable	[-1, +1]	[-3, +3]
A-VAIC	-.0052	-.0025
	(-3.73)***	(-2.09)*
R&D Expenses to Sales Ratio	-1.0243	-.5225
	(-4.73)***	(-4.40)***
Constant	.1074	.0474
	(5.94)***	(3.64)***
R^2	0.88	0.96

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7 demonstrates the results for the Laboratory, Optic, Measure, and Control Instruments industry with 18 deals. The A-VAIC coefficients for CAR [-1, +1] and [-3, +3] are statistically significant at the negative level. Not shown in Table 4.4, the coefficients for Tobin's Q, EVA, VAIC, M-VAIC, and MVA are statistically insignificant for both CAR windows [-1, +1] and [-3, +3]. The industry's mean-variance inflation factor (VIF) for all the regressions is below 10. Hence, the analysis has no multicollinearity problem. The White test (White, 1980) did not reject the hypothesis that there is no heteroskedasticity in residuals. The A-VAIC results suggest that intellectual capital negatively influences the stock performance of acquirers from the Laboratory, Optic, Measure, and Control Instruments industry around the announcement date.

TABLE 8
IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE AROUND THE ANNOUNCEMENT DATE. COMPUTER PROGRAMMING, DATA PROCESSING INDUSTRY

Variable	EVA		MVA	
	[-1, +1]	[-3, +3]	[-1, +1]	[-3, +3]
EVA	0.00000	-0.000001	.000121	.000222
	(1.39)	(-1.97)**	(0.65)	(1.82)*
R&D Expenses to Sales Ratio	-.01488	-.0332	-.01937	-.0260
	(-0.30)	(-0.93)	(-0.39)	(-0.73)
LN (Acquirer Size)	-.0018	.0049	-.0008	.0029
	(-0.53)	(1.87)*	(-0.28)	(1.21)
LN (Deal Value)	-.0005	.0001	-.0005	.0008
	(-0.14)	(0.02)	(-0.13)	(0.32)
GDP Growth Rate	-.0022	.0075	-.0026	.0085
	(-0.10)	(0.50)	(-0.12)	(0.57)

Constant	.0248	-.0646	.0204	-.0608
	(0.30)	(-1.20)	(0.25)	(-1.15)
R^2	0.67	0.86	0.67	0.86

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8 presents the results for the Computer Programming and Data Processing industry, which underwent 95 acquisitions, the largest number among the analyzed high-tech industries. The EVA coefficient for CAR [-3, +3] is negatively statistically significant, although very close to zero. On contrary, the MVA coefficient for CAR [-3, +3] is positively statistically significant. Not reported in Table 4.5, the coefficients for Tobin's Q, VAIC, M-VAIC, and A-VAIC are statistically insignificant for both windows CAR [-1, +1] and [-3, +3]. Tests do not show multicollinearity and heteroskedasticity problems. Following the MVA results, intellectual capital has a positive impact on the stock performance of acquiring companies in the Computer Programming and Data Processing industry around the announcement date over a 7-day time period.

In the Drugs industry regressions, the coefficients for all six indicators of intellectual capital (Tobin's Q, EVA, MVA, VAIC, M-VAIC, and A-VAIC) were statistically insignificant for both CAR windows [-1, +1] and [-3, +3]. It implies that intellectual capital does not influence the stock performance of companies in the Drugs industry that acquire around the time of acquisition announcements.

Regressions result for industries neither validate nor reject Hypothesis 3 which proposes that industries configuring their resources through intellectual capital achieve improved stock performance around the acquisition announcement day. The direction in which intellectual capital impacts stock performance around the announcement date depends on the chosen measures of intellectual capital. The stock performance of most industries around the announcement date is influenced by intellectual capital. The coefficients of intellectual capital (Tobin's Q, VAIC, and MVA) for the Computer and Office Equipment, Computer Programming, Data Processing, Laboratory, Optic, Measure, Control Instruments, Surgical, Medical, Dental Instruments, and Electronic Components and Accessories industries around the announcement date are significant, with signs changing from the [-1,+1] to [-3, +3] windows. The [-1, +1] Tobin's Q and MVA coefficients validate Hypothesis 3 for the Electronic Components and Accessories industry: intellectual capital is positively related to stock performance around the announcement date. The [-1,+1] VAIC coefficient does not validate Hypothesis 3 for the Electronic Components and Accessories industry This the findings fully validate the prediction and are consistent with the theoretical rationale advanced by De Man and Duysters (2005); Kohers and Kohers (2000); Shergill and Sarkaria (1999); Zeghal and Maaloul, (2010); Kim et al. (2021); and Desai and Jain, (1999). To deal with the high-growth nature of the high-tech industry, high-technology firms embrace acquisitions as an effective tool to enhance resources and capabilities; support the findings by showing that the Industry's abnormal returns are positive in the short-run and there is much support for creating value in the high-tech Industry (De Man & Duysters, 2005; Kohers & Kohers, 2000). In the same vein, Shergill and Sarkaria (1999) argued that the prominence of considering industry type as a significant determinant of firm-level performance is well recognized, and both industry effects and firm characteristics significantly influence growth and profitability dimensions. Additionally, abnormal returns during the announcement period are significantly and positively associated with changes in direction; thus, financial performance may corroborate the stock market performance results (Desai & Jain, 1999). Companies' intellectual capital positively impacts economic performance. Additionally, the association between intellectual capital and stock market performance is only marginally significant for high-tech enterprises (Zeghal & Maaloul, 2010). Kim et al. (2021) argued that in settings where the acquirer's and target's Industry are unambiguously close that is, they share the same SIC code, signifying that when the acquirer has knowledge and proficiency in that Industry and that intellectual capital is associated with significantly positive stock performance.

Next, the paper investigates whether intellectual capital impacts short-run stock performance depending on the industry type following Hypothesis 4. Table 9 shows the one-month stock performance regression results by industries.

TABLE 9
SHORT-RUN IMPACTS OF INTELLECTUAL CAPITAL ON STOCK PERFORMANCE

Industry	**Drugs**	**Surgical, Medical, Dental Instrum.**	**Computer and Office Equipment**	**Commu-nication Equipment**	**Electronic Compo-nents and Accessories**	**Computer Programm, Data Processing**
Variable	**VAIC**	**MVA**	**VAIC**	**VAIC**	**M-VAIC**	**MVA**
Intellectual Capital Measure	-.0056	.0023	.0969	.2040	-.0272	.0004
	(-4.72)***	(2.68)**	(2.51)**	(6.56)***	(-2.40)**	(1.92)*
R&D Expenses to Sales Ratio	-.0026	-.0031	-.0275	.3367	-.0066	.0206
	(-7.43)***	(-0.77)	(-0.95)	(2.15)**	(-0.37)	(0.80)
GDP Growth Rate					-.0030	
					(-0.68)	
Constant	-.0062	-.0014	-.1032	-.2471	.0381	-.0056
	(-1.07)	(-0.04)	(-2.55)**	(-4.96)**	(1.90)*	(-1.53)
R^2	0.1821	0.1044	0.1511	0.7674	0.1214	0.0221

The t-statistics are in parentheses below the coefficients. The superscripts *, **, and *** mark statistical significance at the 10%, 5%, and 1% levels, respectively.

The R-Square values in Table 4.7 change between 0.0221 and 0.7674. The VAIC (Drugs) and M-VAIC (Electronic Components and Accessories**)** coefficients for CAR [+24] are negatively statistically significant. The MVA (Surgical, Medical, Dental Instruments), VAIC (Computer and Office Equipment), VAIC (Communication Equipment), and MVA (Computer Programming, Data Processing) coefficients are positively statistically significant for window CAR [+24]. These results imply that the 1-month stock performance of the Drugs and Electronic Components & Accessories industries is negatively affected by intellectual capital, whereas the short-run stock performance of the Surgical & Medical & Dental Instruments, Computer and Office Equipment, and Computer Programming & Data Processing industries is positively influenced by intellectual capital.

The coefficients of intellectual capital (VAIC and MVA) for the Surgical, Medical, Dental Instruments, Computer and Office Equipment, Communication Equipment, and Computer Programming Data Processing industries are positive and significant. These results confirm Hypothesis 4 and validate the prediction of the positive relationship between intellectual capital and short-run stock performance. However, the coefficients for the Drugs and Electronic Components and Accessories industries are negative and significant, implying that intellectual capital negatively affects the stock performance of these industries in the short run. The moderation effects help us understand how the influence of intellectual capital on stock performance varies across different industries, thereby providing a more nuanced view of the relationship.

IMPLICATIONS AND CONCLUSION

The various measurement proxies employed in the study indicate that there is no uniform measurement for intellectual capital, and that the industry factor is a key consideration when investigating intellectual capital measures. Furthermore, the hypotheses present outcomes that support both the positive and negative impact of intellectual capital on stock performance. Also, the study reaffirms that different proxies may measure intellectual capital, improving overall performance within the high-tech Industry. These results are consistent with the existing literature, which demonstrates that intellectual capital has a positive role in enhancing stock performance around the announcement date, in the short term, and in the post-acquisition period. Based on the main findings discussed above, the research question initially posed in connection with the hypotheses can be confirmed to be true, indicating that intellectual capital enhances the overall and some industry stock performance of technological acquisitions, as measured by a few key indicators of intellectual capital.

The intellectual capital Tobin's Q measure's impact is consistent with the studies by Wang (2013), Chung and Pruitt (1994), and Robert et al. (2006), which show that Tobin's Q positively relates to firm value. The overall high-tech industries, including electronic components and accessories, as well as computer and equipment industries, displayed improved stock performance around the announcement date period but a diminished performance after the acquisition completion period. The remaining sectors – Drugs, Surgical, Medical, Dental Instruments, Laboratory, Optics, Measurement, Control Instruments, Computer Programming, Data Processing, and Communication Equipment - show an adverse relationship between Tobin's Q and stock performance around the announcement date period. All sectors show an adverse relationship between Tobin's Q and stock performance during the post-acquisition period.

The intellectual capital EVA measure effect is substantiated with the study by Chen et al. (2004), showing that EVA is found to have a significant relationship between EVA and stock performance around the announcement date but with no relationship during the after-acquisition completion period, which establishes the validity and rationality of the intellectual capital measurement model overall. The respective industries – Drugs, Electronic Components and Accessories, Surgical, Medical, Dental Instruments, Laboratory, Optics, Measurement, Control Instruments, and Communication Equipment - displayed an unfavorable relationship between EVA and stock performance around the announcement date and after the acquisition completion period. However, while employing the EVA measure, the Computer Programming, Data Processing, and Computer and Office Equipment industries displayed improved stock performance around the announcement date. Additionally, the Computer and Office Equipment industry exhibited improved stock performance following the acquisition completion period. The empirical study further establishes an astonishing relationship between EVA and stock performance. Thus, organizations should oversee and strengthen their intellectual capital from a consolidative perspective.

The intellectual capital MVA measure influence is in agreement with the study by Brennan (2001) and Obeidat et al. (2021), showing that MVA has a statistically significant positive effect on market performance. The results of the analysis showed the relationship between MVA and market performance. The overall and respective industries, such as Drugs, Laboratory, Optic, Measure, Control Instruments, Computer and Office Equipment, and Communication Equipment, displayed an unfavorable relationship between MVA and stock performance around the announcement date. The after-acquisition completion period showed an unfavorable overall performance in all industries except for the Surgical, Medical, Dental Instruments, and Computer Programming Data Processing industries. Electronic Components and Accessories, as Well as the Surgical, Medical, Dental, and computer programming and data processing industries, displayed improved stock performance around the announcement date. The surgical, Medical, Dental, and Computer Programming Data Processing industries showed favorable stock performance after the acquisition completion period, as indicated by the MVA measure. This indicates that companies should focus more on intellectual capital.

The impact of the intellectual capital VAIC measure aligns with Xu and Liu's (2020) contribution to the intellectual capital literature, suggesting that intellectual capital is a critical driver of value creation in high-tech industries. The overall high-tech sector and Electronic Components and Accessories industries

displayed improved stock performance around the announcement date, as indicated by the VAIC measure. Furthermore, Drugs, Surgical, Medical, Dental Instruments, Laboratory, Optic, Measure, Control Instruments, Computer Programming, Data Processing, Computer and Office Equipment, and Communication Equipment displayed an unfavorable relationship between VAIC and stock performance around the announcement date. The acquisition completion period revealed an unfavorable relationship between stock performance and intellectual capital overall, with all sectors, except for Computer and Office Equipment and Communication Equipment, achieving a favorable outcome.

The effect of the intellectual capital M-VAIC measure corroborates the findings of Ulum (2015) and Ulum et al. (2017), which shows that M-VAIC positively influences current and future stock performance. It signifies that MVAIC can be used to predict the future of stock performance. The overall high-tech industries, including Electronic Components and Accessories, and Communication Equipment, displayed improved stock performance around the announcement date period, as measured by the M-VAIC. Furthermore, Drugs, Surgical, Medical, Dental Instruments, Laboratory, Optic, Measure, Control Instruments, Computer Programming, Data Processing, and Computer and Office Equipment displayed an unfavorable relationship between M-VAIC and stock performance around the announcement date. The post-acquisition completion period revealed an unfavorable relationship between stock performance and intellectual capital overall, as well as in all sectors. The findings extend the understanding of the role of intellectual capital in generating corporate value and creating sustainable advantages for corporations in emerging markets.

The A-VAIC measure is employed in the study by Nadeem et al. (2019), which shows that intellectual capital, as measured by A-VAIC, indicates a significant positive connection between intellectual capital and stock performance. The overall and high-tech industries, which comprise Electronic Components and Accessories, Computer and Office Equipment, Surgical, Medical, Dental Instruments, Laboratory, Optical, Measuring, and Control Instruments, displayed improved stock performance around the announcement date period while employing the A-VAIC measure. Furthermore, industries such as Drugs, Computer Programming, Data Processing, and Communication Equipment showed an unfavorable relationship. The after-acquisition completion period revealed an unfavorable relationship between stock performance and intellectual capital overall, with all sectors, except Communication Equipment, achieving a favorable outcome. Consequently, the A-VAIC model can be applied with certainty to measure intellectual capital, indicating that A-VAIC can serve as a crucial suggestion for both the academic world and commerce in relation to the dimension of intellectual capital.

Resources are valuable when they capacitate companies to apprehend or execute strategies that enhance efficiency and effectiveness. To view competitive advantages, valuable firm resources must be rare, implying competitors or prospective competing firms do not highly acquire the resources to implement the value-creating strategy. Intellectual capital is a useful visible resource that drives a firm's growth and provides superior value for stakeholders. Hence, the study links intellectual capital to an organization's ability to create and sustain a competitive advantage from a resource-based viewpoint. This study is consistent with Edvinsson and Sullivan's (1996) findings, which suggest that corporations utilize intellectual capital resources to create value. This declaration implies that the implicit knowledge embedded in the resources may necessitate supportive infrastructure regarding organizational methods and documentation, technology systems, company branding, and creativity to spur organizations to reach their full potential. In addition, the capabilities through resources may influence companies' status and enhance performance within a particular industry.

The findings suggest that realizing superior stock performance depends on a firm's intellectual capital and industry type. Intellectual capital may contribute to healthy stock performance in technological acquisitions. The present findings expand our understanding of the necessary reforms for enhancing measurement proxies of intellectual capital in the context of high-tech industries. This study presents a valuable technique for practitioners, scholars, and policymakers to follow, evaluating measurement proxies that can indicate reasons for the relationships between intellectual capital and stock performance among acquiring companies and high-tech industries that significantly impact organizational and financial policies. The study revealed that intellectual capital requires a greater focus on strategic reporting in various high-

tech industries. This has demonstrated the potency of corporations to generate returns and, as a result, attract investors in the market and other stakeholders. Companies may formulate their business strategies to increase the efficiency of their resources and gain a competitive advantage over their competitors.

The paper highlighted some important managerial implications of the relationship between intellectual capital and stock performance, representing a fundamental connection among the three concepts. In addition, this study provides broad evidence to encourage the development of intellectual capital in their respective industries. The suggested conceptual framework would facilitate their acquisition of reasonable and practical measurements to determine intellectual capital in multidimensional relationships. This study will also provide insight to investors and managers as it helps them evaluate the various measurement proxies under what circumstances intellectual capital may generate value for acquiring companies. Additionally, this research may help select and employ the most suitable measurement proxies of intellectual capital to enhance the organization's stock performance. Subsequently, shareholders and executive managers should be aware of the importance of investing, managing, and preserving intellectual capital to accelerate future growth, primarily through various forms of strategy modification and internationalization, often the chosen growth strategy.

This study better understands how intellectual capital shapes the firm's stock performance. As the global economy becomes increasingly knowledge-based, acquiring and developing superior intellectual capital appears to be fundamental to an organization's capability and success. For managers, this study suggests that to achieve high firm stock performance, organizations may need to acquire and nurture intellectual capital, such as the best and brightest human capital available, and retain it within the organization. This study confirms that the intellectual capital elements are strong predictors of competitive advantage and account for a significant percentage of variation in competitive advantage. Nevertheless, the order of the significance of these variables explains the variance in competitive advantage in the high-tech industries. The outcomes can help management increase initiatives to advance elevated insight and recognition of the concept of intellectual capital, which improves competitive superiority in high-tech industries.

For researchers, the results suggest that the RBV theory has correctly identified the importance of intellectual capital, particularly as a critical determinant of firm success; however, not all intellectual capital is equal, and not all benefits accrue to the acquirer. This study lays the groundwork for future researchers to build theories about additional possibilities surrounding intellectual capital and stock performance relationships. The overall consistency of this study's findings provides a degree of confidence that, among these high-performing acquisitions, companies' experience was significantly related to the competitive advantages pursued by these companies

A consistent theme throughout these findings was the importance of high-tech firms; technical skills are critical to success regardless of their strategies. This research constitutes an important step in examining the relationship between intellectual capital components and competitive advantage. In addition, robust conclusions could have practical implications for managers seeking to enhance new venture performance by leveraging intellectual capital across applicable corporate teams. Such intellectual capital would be helpful for those whose job is to select and develop upper-level managers. It would also benefit policymakers trying to predict competitors' moves and countermoves. This paper discovered the current literature on intellectual capital and its power on stock performance. The conceptualization of intellectual capital is closely correlated with certain fundamental principles of stock performance.

The literature reviews show that reasonably strong evidence demonstrates that the blend of intellectual capital augmentation in organizations promotes innovativeness and more excellent stock performance. Studies also clearly confirm that stock performance is impacted by intellectual capital. In light of this, converting the entire workforce into the most valuable assets for the organization should be considered to pave the way for superior achievements. Henceforth, corporations should develop effective plans, especially in investing in various aspects of intellectual capital, as this not only enables firms to achieve superior performance but also ensures companies can maintain a competitive advantage for their long-term existence.

In summary, multiple high-tech acquisitions may enhance innovation output, but strategic considerations, adequate integration, and alignment are essential for maximizing the benefits that may improve performance (Arthur & Khindanova, 2023).

This study examines the impact of intellectual capital on the stock performance of 262 U.S. acquiring companies that engaged in technological acquisitions between 2012 and 2016. It contributes to the intellectual capital literature by presenting empirical research using the various measures of Tobin's Q, EVA, VAIC, M-VAIC, A-VAIC, and MVA.

This paper has limitations. The first disadvantage is the small sample size (262 acquisitions), which could compromise the robustness of the results. Secondly, the dataset, which comprises targets from a single country, limits the external validity (generalizability) of the findings. Hence, further studies could conduct several robustness checks and utilize data from other countries to determine whether the conclusions of this single-country study are applicable to other emerging economies.

In summary, this paper supports the notion that technological acquisition transactions have a positive impact on the firm's stock performance around the announcement date. It is recognized that a firm's intellectual capital plays a significant role in creating a competitive advantage. However, at this point, there may still be room for experimentation in quantifying and reporting on intellectual capital. Given the potential for both complication and multiplicity, developing intellectual capital measures in reporting practices that are comparable between industries remains one of the critical challenges. A wide range of precedent principles is currently available to assist in managing the firm's intellectual capital, drawing on various disciplines and other perspectives.

In addition, the results of this study provide further empirical evidence on the contribution of intellectual capital to the current and future performance of acquiring companies. Thus, how well acquiring companies do in applying expertise will become a competitive factor. Managers, especially those in high-tech industries, need to understand the importance of intellectual capital, a critical factor affecting a corporation's ability to remain viable in the international market. For intellectual capital to be managed successfully and effectively, it is essential to classify it, understand its components, measure it correctly, and link it to the company's strategy. Intellectual capital management and performing research on its relationship with firm performance indicate the need for it to be measured as precisely as possible. By separating the various intellectual capital measurement proxies and then reevaluating existing theoretical and empirical evidence supporting such proxies, this paper has established a starting point from where we would like to reassure scholars to pick up the themes identified in the study to further the pitch of intellectual capital measurements proxies and how each of the proxies' influence the firm's stock performance in non-high-tech industries.

Researchers may focus on discussing the influence of intellectual capital on stock and performance by employing standalone or combined measurement proxies, as discussed in this study. Future research may suggest that intellectual capital plays a direct or indirect role in examining a firm's stock performance. It is crucial to note that the intellectual capital research stream is a refining area that will connect profoundly with underlying corporate issues of this era.

Looking ahead, future research inspired by our study's findings could reveal fascinating insights into long-term stock performance, showing that outcomes vary significantly across different industries. Therefore, this study suggests that scholars must revisit how acquisition performance is analyzed. The potential impact of this reevaluation on future research is significant, inspiring scholars to contribute to this evolving field. Stock performance should be examined only around the announcement date, as there tends to be much noise in the market in the long run. There may be instances where evaluating long-run stock performance may be crucial when the industry is analyzed.

In summary, this paper supports the idea that intellectual capital has the power to enhance corporations' competitive advantage and positively improve the firm's stock performance around the announcement date and in the short run after the acquisition completion period of technological acquisitions for some industries.

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