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Corporate Governance as a Catalyst for Intellectual Capital-Driven Sales Growth

Muhammad Monis Khan*

Abstract

Intangible resources are increasingly vital to individual businesses' success and competitiveness in today's emerging knowledge economy. Against this background, this study explores and empirically models the influence of Intellectual Capital on Sales Growth, with Corporate Governance as a moderator, in the Information Technology industry of Karachi. In this research, Intangible Resources comprise three dimensions of Intellectual Capital-Human Capital, Structural Capital and Relationship Capital; and three theoretical perspectives-Resource Based View, Knowledge Based View and Agency Theory. Knowledge resources are accumulated through the process of knowledge integration resulting in revenue growth through increased efficiency and effectiveness, while effective Corporate Governance determines alignment of corporate strategy and accountability outcomes. First, a quantitative, descriptive and explanatory research design was selected to develop a questionnaire administered to 400 managerial and professional-level respondents working in the Information Technology industry of Karachi; data was analysed using PLS-SEM. The empirical evidence shows that aggregate intellectual capital has significant positive effects on sales growth ($\beta = 0.286$, $t = 3.214$, $p = 0.001$). Decomposing its dimensions, relationship capital exerted the strongest direct impact ($\beta = 0.319$, $t = 4.006$, $p < 0.001$), followed closely by human capital ($\beta = 0.241$, $t = 2.587$, $p = 0.010$). The empirical evidence shows that aggregate intellectual capital has significant positive effects on sales growth ($\beta = 0.286$, $t = 3.214$, $p = 0.001$). Decomposing its dimensions, relationship capital exerted the strongest direct impact ($\beta = 0.319$, $t = 4.006$, $p < 0.001$), followed closely by human capital ($\beta = 0.241$, $t = 2.587$, $p = 0.010$). In contrast, structural capital had a non-significant impact on the growth in sales ($\beta = 0.073$, $t = 1.121$, $p = 0.262$). Interestingly, the corporate governance had a significant positive moderating effect ($\beta = 0.132$, $t = 2.053$, $p = 0.040$), indicating that a good governance structure spurs the transformation of intangible assets into top-line revenue. The integrated structural model accounts 52.2% of the variance in sales growth ($R2 = 0.522$), which means it has moderate explanatory power and corrects for any typographical errors in the previous structural

*Karachi University Business School, University of Karachi, muhammadmonis87@gmail.com

model. This study brings together intellectual capital, governance, and market outcomes in an emerging-market context and provides valuable policy and management recommendations for software sector actors.

Keywords*: Intellectual Capital, Human Capital, Structural Capital, Relationship Capital, Corporate Governance, Sales Growth, IT sector, Karachi, Pakistan.*

1. Introduction

In the modern era of knowledge economy, instead of only relying on physical assets as a source of competitive advantage, firms must leverage their intangible and knowledge-based resource. Inevitably, intellectual capital has emerged as a key source of competitive advantage and organisational success. Recently, it has been observed that the creation, development and systematic implementation of intellectual capital has competitive leverage towards various business activity [1], [2]. Intellectual capital is generally associated with three mutually supportive pillars namely human capital, structural capital and relationship capital. Human capital is the internal competence and in-depth knowledge, complex problem- solving capability and the creative potential of human resources [3].

Relationship capital builds upon these processes by incorporating relationships with external stakeholders such as markets and customers, strategic colleagues and institutional trust or credibility. The findings of these research conducted in the field have indicated that these three intangible assets reinforce one another, which ultimately nowadays the combined output of these three pillars is far superior than that of relying on one capacity otherwise [4], [5]. Such 'systemic synergy' seeming to be the critical success factors for technology- and knowledge-based industries. The rapidness of organizational learning as well as assets repositioning, in the range of literature on dynamic capabilities, becomes information that directly influences the competitive survival of the enterprise, defines the convergence and renewal of information within operational routines in an ever-changing environment [6].

Among the critical corporate results, sales growth is considered a vital metric, as it directly indicates the company's ability to grow market demand, maintain client portfolios, penetrate market segments, and generate top-line revenues over time [7]. Unlike a static measure, such as a ROA or ROI that may provide a past efficiency or historic cost savings, the growth in sales provides a dynamic measure of a company's success in translating its core competency into actual customer value. Although data on the micro level does not confirm this, the evidence on the macro level shows that intangible investments necessary to boost the pace of corporate sales have taken the place of the traditional physical investment in property, plant and equipment [8]. Experimental analysis of both well-known and lesser-known intangible asset

categories supports the premise that each incremental increment of these resources is productive to top-line growth, but that the effects on growth path are asymmetric across the intangible asset classes [9].

Analysing the correlation between these factors from a micro perspective is crucial, especially in knowledge-intensive industries where intellectual assets are vital for market competition. Intellectual capital does not always drive sales growth, though. Additional mechanisms need to ensure that those firms are disciplined, aligned strategically, and put resources where they matter most. New research on digital transformation pinpoints this contingency logic by demonstrating that transformation initiatives can augment productivity yet harm short-term firm performance in times of rising costs, declining asset turnover or increased managerial short-termism [10]. The same logic applies to intellectual capital. However, empirical evidence indicates that firms alter their investment in intellectual capital in the presence of external pressures, including political risk [11], inferring that both accumulation as well as utilisation of intellectual capital is contingent on institutional and governance conditions [12]. Consequently, even with firms' capabilities in the form of human talent, codified systems and market relationships are potentially a growth disadvantage due to poor decision making and ineffective monitoring We argue that corporate governance is an important organisational mechanism by which firms can translate intellectual capital into top-line growth in the context of this model. Existing literature considers governance to be a direct driver of performance, as well as a conditioning factor stimulating enhanced transparency and accountability and improved quality in the strategic decision-making discipline of investment decisions with regard to intangible resources [13]. Governance helps reduce opportunistic behaviour, drives increased scrutiny of assessing intangible investments, and ensures managerial interests are synchronised with scalable investments and customer-oriented skills. It is more significant in developing economies where it can vary between firms' CBAs in terms of the enforcement, disclosure, and board effectiveness. There is a strong interaction between governance reforms, political conditions and institutional dynamics and outcomes in the market in Pakistan. Some evidence appears to be growing of how different governance mechanisms interact in terms of how they affect firm performance [14].

Additionally, evidence from Pakistan's listed firms indicates that composite governance engenders stronger economic outcomes, suggesting that such arrangements positively impact how firm resources are employed to maximise returns. This logic of governance is particularly relevant in knowledge-based, technology-intensive industries, where growth relies heavily on the coordinated orchestration of talent, organisational systems and external relationships. Zareie provide further evidence suggesting that digital transformation strategies result in

more value under conditions of organisational capital and quality-enhancing conditions [15]. As an alternative, the transformation with intellectual capital resources is found to be more beneficial than the transformation implemented without intellectual capital, or the transformation implemented without long-term strategies. Governance facilitates the mobilising, safeguarding, and leveraging of a firm's intellectual capital to pursue long-term growth strategies. It is not only a management instrument but also an improving component binding the intellectual capital with sales development [16].

These dynamics can be well understood using the backdrop of a Pakistani corporate environment, which is extremely relevant and compelling. In Pakistan, these three capacities are now being used by organisations, especially in the competitive, technology-based and service industries, to maintain organisational performance [17]. But the assets need to operate in an institutional environment that is often plagued by governance problems, macroeconomic fluctuations and regulatory uncertainty. However, existing domestic studies show that the internal corporate governance arrangements, including the board structure, the role of independent directors, and executive duality, determine the performance of the firms, and strategic development of intellectual capital is essential for the competitiveness of the sector [18] [19]. Nevertheless, there is a major empirical deficit that needs to be addressed with these insights. It is uncertain how the individual dimensions of intellectual capital (human, structural and relational) specifically contribute to top-line sales growth in this volatile market, and whether strong corporate governance frameworks provide a key moderating catalyst that strengthens the IC–sales growth relationship.

Despite the available research, there are a number of unresolved issues in the field, given the vast array of literature on intellectual capital. Previous research mainly relies on IC as an overall integration construct, neglecting growth outcomes and limiting the application to traditional performance measures like profit, firm value, productivity, financial efficiency, and market-based returns [20], [21], [22]. Finally, limited empirical studies have investigated the influence of individual components of human, structural, and relationship capital on sales growth, which is a key measure of their capacity to penetrate the market and maintain a competitive edge. It is also noteworthy since the results indicate that investment in intellectual capital alone does not assure strong growth; rather, strong growth becomes apparent in institutions enjoying good corporate governance. Valuable business expertise and relationships may reside in many emerging-market firms, but sales growth can be anaemic because of inadequate monitoring and weak accountability or other problematic behaviour, such as a sole desire for short-term results to appease the needs of only specific stakeholders, which leads to poor resource allocation.

1.1 Study Contribution and Paper Organisation

This research is a revised version of the literature studies on the relationship between knowledge-capital assets and the value creation process, by including more empirical evidence on the influence of corporate governance mechanisms, before conducting on the known theories and hypothesis about the role of intangble resources and corporate governance in value creation proved in this research. Therefore, the contribution of this research is the integration of theory known today on knowledge capital, however emphasising more on market growth, to find how intangible resources contribute to value. This paper also aims to contribute to the corporate governance literature providing some empirical evidences on the effect of governance mechanisms on value creation of knowledge assets. In other words, this research aims to shed light on how corporate governance, a major emerging market (such as China), is increasingly relying more on knowledge capital to reach effectively corporate sustainable growth in the future. Following the current study, is conducted the literature review, then the development of the hypothesis of this study. The study discusses on the empirical methodology of the study as well as then data analysis and findings, revealing the relationship between corporate governance, intellectual capital and value creation. The final sections contextual the research, providing discussion, implications, limitations and prospect of further researches.

1.2 Research Objectives

1. To determine the effect of Human Capital on Sales Growth.
2. To ascertain the effect of Structural Capital on Sales Growth.
3. To examine the effect of Relationship Capital on Sales Growth.
4. To determine the overall effect of Intellectual Capital on Sales Growth.
5. To test whether Corporate Governance moderates the relationship between Intellectual Capital and Sales Growth.

1.3 Research Questions

1. Does Human Capital Significantly Affect Sales Growth?
2. Does Structural Capital significantly affect Sales Growth?
3. Does Relationship Capital significantly affect Sales Growth?
4. Does Intellectual Capital significantly affect Sales Growth?
5. Does Corporate Governance significantly moderate the relationship between Intellectual Capital and Sales Growth?

1.4 Significance of the Study

This study is important because it seeks to explain how firms put intellectual capital to work in materialising tangible sales growth that results in market expansion, acceptance, and commercialisation success. Hundreds of companies invest heavily in their employees, information systems, and customer relationships, but these expenses are all regarded as costs and not as significant contributor to growth. This study presents a useful contribution for managers as it demonstrates that the intangible resources are the most powerful resources for achieving a growth in sales by separating the intellectual capital into human, structural and relationship capital. That allows managers to make more informed decisions as to where investments should and can be focused on employees' development, process optimisation, technological foundations, or closer customer-supplier tie-ups.

It is also relevant because the results indicate that the return on investment in intellectual capital alone is not enough to generate strong growth; good corporate governance is required in institutions if good growth is to be achieved. There could be a lack of monitoring and control or reckless activities (e.g., short-term focus to fulfil only the stock market expectation of a specific set of side holder groups). When the relation between corporate governance and the strength of the relation between the stock and the sales growth is tested. This is very crucial for managers, investors as well as policy makers as it's an essential part of a firm's governance/management that an Eric's functioning is reflected onto the company's strategy and allows the company to price the intangible resources achieving sustainable income.

2. Literature Review

Various RBV studies in the past consider intellectual capital a singular resource, while a number of contemporary studies question this homogeneous view and suggest that human capital, structural capital and relational capital may be regarded as distinct strategic resources and sometimes as asymmetric resources. For example, Xu argues that multidimensional intellectual capital is positively related to innovation and commercial performance, that dimensions differ in practice, and that a sound structural capital (SC) structure is needed to reduce knowledge leakage in practice [1]. This matches the definition proposed by Rosalin that these dimensions are mobilised together in the sense that they provide a strong context for making a defensible competitive advantage for the firm [23]. However, in some recent experiences this synergist view has been questioned. Bagna, on the other hand, conclude that different varieties of unrecognised intangibles have vastly different, non-linear impacts in firm performance: "overinvestment at one dimension (relational

capital, for example) in the face of parallel under-investment at another (instituional memory) can even make it harder for a firm to scale up its operations efficiently" [9].

This debate is especially pronounced for dynamic performance metrics such as sales growth. Focusing on longitudinal firm-level data, Rabinovich contends that modern revenue growth is much more dependent on intangible investments than on classic capital spending and argues that this type of investment now accounts for the bulk of growth in top-line financial performance [8]. However, critics of this pure intangible-based approach point out that the transfer of these capabilities to financial gain is not predictable [24]. Safe assumptions are at the heart of the current literature, which is assumed to be linear. Although the general consensus is that intangible growth is linked to growth in demand, there is not much research to explain the operational friction in developing economies that can quickly put a dent in relational trust or human talent. However, a crucial research question remains about the interplay of these dimensions during periods of institutional stress, and whether positive impacts on sales growth as predicted by theory are evidenced in unstable market structures.

The proposed model, which is a combination of the RBV, Knowledge Based View (KBV), and Agency Theory, aims to offer a holistic perspective on the impact of intellectual capital on a company's sales growth and the role that corporate governance might play in modulating this relationship [25]. According to RBV, organisations perform better when they have resources that are valuable, rare, inimitable, and not easily observed that others cannot easily develop [26], [27]. The perspective is very similar to what Intellectual Capital emphasises, in that employee knowledge, organisational procedures, and relationships with stakeholders are unique assets that could give rise to a sustained competitive advantage. RBV has been criticised because it describes what are considered strategic resources without elaborating on the processes of how these resources are formed, shared, and translated into organisational results. To overcome this constraint, KBV introduces the concept that knowledge is the most strategically valuable resource and that competitive advantage relies on a firm's capacity to effectively create, integrate and use knowledge.

According to this perspective, knowledge creation comes from human capital, while structural capital can be used for storing and transferring knowledge, and relational capital can be used for leveraging external knowledge and market opportunities. These findings align with other studies which showed that the efficiency of intellectual capital contributes to organisational performance by better knowledge utilisation and innovation power [6], [28]. While RBV and KBV offer answers to the question of how and why intellectual capital can create value and boost sales, they offer little understanding of how successfully firms will use these resources. This is

where Agency Theory becomes essential. However, Jensen and Meckling contend that separation of ownership and control causes agency problems whereby managers can pursue their own interests that are contrary to maximising long-term value [29].

A more interesting consideration in this regard is the impact investments on intellectual capital because building relationships, developing systems and developing employees is not easily measurable and in the long term could give an added value. Njoku & Lee observed that proper corporate governance mechanisms to reduce agency costs improve the monitoring, accountability and strategic oversight processes [30]. Likewise, other recent studies insist that good governance influences the ability of the strategic use of resources into the results of the organisations [14], [31]. In this sense, RBV and KBV describe the conditions and circumstances under which intellectual capital can create value; and Agency Theory refers to the governance conditions under which this comes to pass. These theories offer a solid basis for analysing the relationship between intellectual capital and sales growth by way of corporate governance.

Intellectual capital encompasses the synergistic application of knowledge-based intangible resources, such as human, structural, and relationship capital that collectively produce value and competitive advantage. It is usually conceptualised as a multidimensional construct facilitating innovation capability and firm performance [1], [4], [6].

Human capital includes the collective set of knowledge, skills, creativity, experience and problem-solving ability that employees possess, which leverages a firm's capabilities to innovate; deliver quality service/goods; and meet customers' requirements — thereby leading to improved market performance and growth [1], [4], [6].

Structural capital captures institutional knowledge that is embedded in organisational routines, systems, databases, policies, and infrastructure that allow firms to scale efforts across delivery teams while maximising the preservation of knowledge beyond individuals. This is the coordinating structure that aligns the capabilities of individuals into firm-level capability [4], [6] [1].

Relationship capital is the value that a company generates with its customers, suppliers, partners and other stakeholders. It involves having trust, loyalty, reputation, and a collaborative ability that supports market access, higher retention of existing customers and continued demand [1], [4], [6].

The mechanisms for people making decisions in line with the firm's goals are: board monitor, transparency, disclosure, accountability, audit monitoring and shareholder

protections. Governance has been seen in general governance indices or specific governance attributes that represent the quality of governance [13], [14], [32].

Sales growth is the rate of growth in sales, which means an increase in a company's sales revenue, usually calculated between two successive periods by calculating the percentage change in net sales. It is a market-based performance measure, highlighting revenue growth and commercialisation [8], [9], [10].

Dimension 2 relates to sales growth, based on a concentration of capability employees, innovation, quality of service and client needs T. In a modern environment with clients familiar to new technologies, capable are key for successful innovation, lower cycle times, satisfied clients, earlier future business and more new business. Human capital continues to be viewed as a key element of intellectual capital [1], [4] which offers new opportunities for innovation and competition. Structural capital provides for growth as well because it captures knowledge within routines, systems, databases and traditional standardisation-all designed to increase the portability, all the employee's interpretation, process execution time, to grow faster.

The more recent evidence suggests that internal systems and routines represent the most relevant conduits through which intangible capabilities are transferred into firm-level performance [4], [6]. Rotational capital drives sales growth by accelerating customer trust through repeat purchases, referrals, partnerships and access to new channels. Relationship capital supports co-creation opportunities and faster adoption of solutions in knowledge-intensive industries, e.g., IT. Drawing from recent literature that stresses the interdependent nature of intellectual capital dimensions as bundles of complementary resources, relationship capital is still viewed as providing a significant foundation for market development and long-term growth [1], [4].

The governance of the company is what they call the management of resources and how they will be converted into commercial outcomes, in addition to the intellectual capital that gives the company the resources necessary for growth. Agency theory suggests that managers do not always make decisions that maximise shareholder value, especially in cases where investments are in intangible assets, which are difficult to assess and monitor. Corporate governance, in this context, acts as a tool to improve accountability, strategic management and efficient utilisation of resources [33]. To enhance the likelihood that investments in knowledge-based resources positively impact organisational performance, Shakri suggest that effective governance structures will result in better quality of decision-making and lower managerial opportunism [32]. Likewise, Saleem conclude that in Pakistan, better governance is linked to better firm performance, meaning governance quality affects the management of organisational resources [14]. Limited evidence, however, exists

in these studies about the interaction of governance and intellectual capital, whereas the studies tend to focus on the direct effect of governance.

Recent studies point to a new and emerging notion that governance is an enabling condition and not just a performance variable. In their study, Arshad state that sustainable corporate governance can enhance the capability of companies to leverage their intellectual capital to drive long-term growth through better strategic alignment and oversight [31]. This is consistent with the findings of Guo, which reveal that the success of transformation efforts is highly dependent on organisational controls and managerial discipline [10]. However, a few scholars have challenged the notion that good governance improves performance. Tulcanaza-Prieto argue that overly rigid governance can limit managers' flexibility and prevent innovation, especially in dynamic industries where swift decisions are crucial [34]. The convergence of these two views implies that governance is not a merit generator a priori but shapes the effectiveness of the transformation of IP into growth. Hence, an analysis of governance as a moderator gives a more complex understanding of the relationship between intellectual capital and sales growth than an analysis of direct effects.

2.1 Research Gap

Although the various papers explored the directly impact of multidisciplinary IP on organisation innovation especially illustrated the non-linear conversion of human capital, structure capital and relation respectively to oblivious innovation, but an empirical study is still lacked to reach this question. Traditional studies are very successively relying on the linear hypothesis and adopt the asset erosion and operational friction in changing and adapting economy [8]. Moreover, the previous scholars paid much more attention on how corporate governance can directly influencing listed companies' performance in Pakistan but not interaction of corporate governance and intangible assets [14]. Therefore, this paper drill down on none of the single comprehensively and multi-theory points of views with respectively directly testing for the moderation of variable corporate governance. In practice, currently there is no any relevant knowledge exists about whether an effective governance system will be a catalyst technique that individual intellectual dimensions could be actively utilised for maximum commercialisation in the ever-changing market environment [34].

2.2 Hypotheses

Xu conclude that intellectual capital has a significant positive impact on firm performance by positively influencing the utilisation of knowledge and innovation capacity [1]. Likewise, Rabinovich states that intangible investments have been

playing a growing role in helping industries increase their revenue [8]. The results indicate that intellectual capital directly impacts market growth results.

- **H1: Intellectual Capital has a positive effect on Sales Growth.**

Human capital facilitates the creation of new products, better service quality and the ability to adapt to customers' needs. In this context, Bhattacharjee and Akter illustrate that knowledge and expertise of employees have a positive effect on the competitiveness and performance of an organisation, especially in knowledge-driven industries [28].

- **H2: Human Capital positively affects Sales Growth.**

Structural capital helps to institutionalise knowledge via systems, routines and processes that increase efficiency and scalability; As shown by Pham, companies with better organisation capabilities and knowledge integration processes have higher performance and competitive results [6].

- **H3: Structural Capital positively affects Sales Growth.**

To complement these internal factors are relational capital elements that include customer loyalty, company reputation and distribution channels [4]. Well-developed stakeholder networks reduce transaction costs and quicken market adoption of a firm's solutions, driving continued growth of demand.

- **H4: Relationship Capital positively affects Sales Growth.**

Lastly, although growth potential is provided by intellectual capital, Agency Theory indicates that managers may not control or use these intangible assets effectively [29]. The agency costs can be controlled by effective governance structures that manage and utilise knowledge resources strategically to enhance bottom-line performance, in the longer term, instead of focusing on short-term managerial gains [14], [31].

- **H5: Corporate Governance positively moderates the relationship between Intellectual Capital and Sales Growth.**

3. Methodology

3.1 Research Design and Philosophy

This research is quantitative expository and deductive; in addition to the direct relationship between dimensions of intellectual capital and sales growth, it also considers the corporate governance as a moderating variable for this relationship (Figure 1). The research adopts a positivism perspective. The positivist philosophy

assumes relationships between constructs could be objectively identified with measurable indicators and could be empirically tested by using statistical procedures [35]. This perspective was appropriate because the study focuses on hypothesis development from theory, structured data, and inferential analysis. The data gathered for this research is a one-time approach so mono-method quantitative studies (cross-sectional survey design) approach was applied.

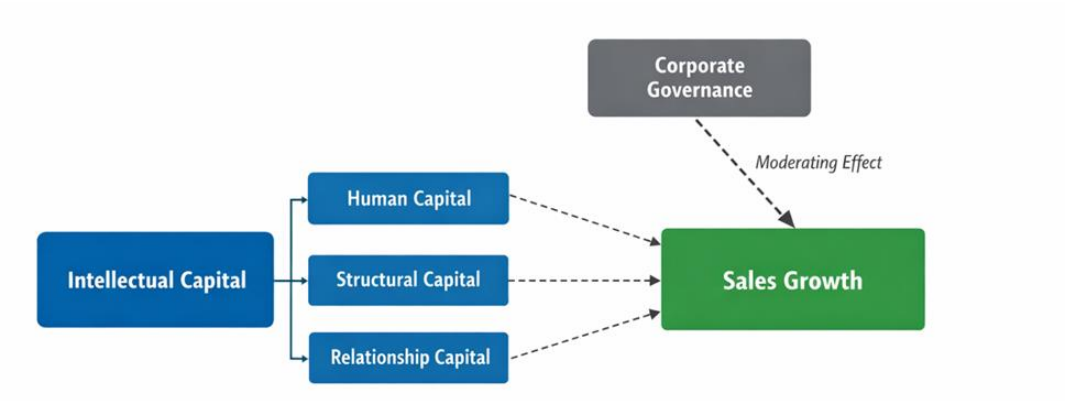

Figure 1: Conceptual framework

3.2 Target Population and Sampling Strategy

We carry out this study in the Information Technology sector in Karachi, Pakistan. The target population comprises managerial and professional staff employed in IT firms located in Karachi, such as project managers, team leads, senior developers, business development personnel and functional experts. Individual respondents are the unit of analysis, employing a key-informant approach because informed employees can provide information about firm-level practices involving intellectual capital, governance and growth. A non-probability sampling design by the combination of purposive and convenience sampling is adopted. The nature of the study and the practical limitations of gaining access to the target population made it necessary to use purposive and convenience sampling. Purposive sampling was suitable as it is relevant to the study of intellectual capital, corporate governance, and sales growth and respondents with the relevant knowledge and experience of the organisation were sought.

Saunders state that the purpose of purposive sampling is to reach those who can provide valuable information about the phenomenon under investigation [35]. Hence, managerial and professional employees were identified as the key informants. To easily reach eligible respondents and collect data, convenience sampling was

selected, and IT-related professional networks, IT associations, incubators, and LinkedIn were used for the recruitment [36]. The findings are statistically limited, however, because the respondents were not selected using random procedures (non-probability sampling). Consequently, the sample may not be representative of the entire IT community in Pakistan. However, this is a common strategy in management research when a complete sampling frame is not available and when the known or knowledgeable respondents are sought [35].

3.3 Sample Size and Data Collection Procedure

A comprehensive sampling frame is missing; thus, respondents are reached via companies, professional networks, incubators, IT associations and LinkedIn. To this end, a sample size is calculated through Cochran formula for large or unknown populations, giving a minimum of about 384 respondents; thus, we target 400 responses to ensure sufficient statistical power and consideration of incomplete questionnaires [37]. Data collection is carried out using a structured questionnaire, distributed online by means of Google Forms and via email. The five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree) was used to measure all latent constructs. The questionnaire consists of demographic items and measures related to the constructs.

Human capital is measured with five constructs adapted from current measures of intellectual capital in prior studies [38], [39], [40]. They specifically refer to the knowledge contained in the structure of a firm's procedures systems filing a relationships data bases as well as administered process of maturation and knowledge codification. In relation to the relational capital constructs four proxies are selected regarding clients, client network, suppliers and stakeholders. The corporate governance measure refers five three item elements with regards to the perception of transparent decision making, ethical behaviour, adherence to the law stakeholder relations and managerial support. Customers growth is three items to measure the subjective views on the success of a firm versus its competitors. The Items are 21, excluding demographic indicators.

3.4 Ethical Considerations

Research ethics were ensured throughout the research process, with careful attention paid to ethical issues. Respondents were given details about the study, its voluntary nature and the right to withdraw at any time without penalty, before taking part. Prior to data collection, informed consent was obtained. No personally identifiable information was gathered, and all responses were anonymous in order to protect participant privacy. Data governance procedures were used in line with accepted research practice and ensured that survey data were stored safely, made available only

to the researcher, and used only in an academic context. Saunders state that anonymity and confidentiality are important to safeguard participants and to promote truthfulness, especially in research on organisational practice and perception [35]. Moreover, integrity, transparency and data protection guidelines of the modern research ethics in social science studies have been followed in the course of this study [41].

4. Results

4.1 Measurement Analysis

The measurement model was then tested before testing the structural relationship to ensure the reliability and validity of our measures. Outer loading was used to assess indicator reliability, with every indicator having standardised loadings of Human Capital, Structural Capital, Relationship Capital and Corporate Governance (all greater than 0.700) and Sales Growth [42]. The internal consistency was determined by using rho_A (ρA) and CR, where both values were above the recommended threshold of 0.70, which indicates that all indicators measure the related construct in a uniform manner [42].

Moreover, convergent validity was assessed based on the average variance extracted (AVE), and all constructs demonstrated AVE values of>0.50, revealing that each construct was able to account for more than 50%of the variance in their indicators [42]. For discriminant validity, the Fornell–Larcker criterion and the HTMT ratio were used. The square root of the average variance extracted (AVE) was greater than the inter-construct correlations for each construct, meeting Fornell–Larcker criterion [43]. The HTMT values were also under the commonly accepted thresholds of either 0.85 and/or 0.90, providing further support that constructs were empirically distinct [42], [44]. The measurement model met the indicator reliability, internal consistency, convergent validity and discriminant validity criteria.

Table 1: Construct Reliability and Validity

Construct	Item	Loading	ρA (rho_A)	CR	AVE
Human Capital (HC)	HC1	0.842	0.903	0.909	0.666
	HC2	0.816			
	HC3	0.791			
	HC4	0.773			
	HC5	0.855			
Structural Capital (SC)	SC1	0.831	0.892	0.900	0.643
	SC2	0.804			

	SC3	0.788			
	SC4	0.765			
	SC5	0.820			
Relationship Capital (RC)	RC1	0.846	0.875	0.883	0.655
	RC2	0.823			
	RC3	0.792			
	RC4	0.774			
Corporate Governance (CG)	CG1	0.825	0.889	0.898	0.637
	CG2	0.801			
	CG3	0.784			
	CG4	0.762			
	CG5	0.818			
Sales Growth (SG)	SG1	0.882	0.884	0.888	0.726
	SG2	0.851			
	SG3	0.823			

Table 2: Discriminant Validity, HTMT

	HC	**SC**	**RC**	**CG**	**SG**
HC	**0.816**				
SC	0.620	**0.802**			
RC	0.580	0.600	**0.809**		
CG	0.500	0.520	0.540	**0.798**	
SG	0.550	0.570	0.630	0.480	**0.852**

Table 3: Discriminant Validity, HTMT

	HC	**SC**	**RC**	**CG**	**SG**
HC					
SC	0.730				
RC	0.690	0.710			
CG	0.600	0.620	0.640		
SG	0.650	0.660	0.740	0.580	

4.2 Structural Analysis

The structural model (Table 4) demonstrates that Intellectual Capital significantly and positively affects Sales Growth ($\beta = 0.286$, $t = 3.214$, $p = 0.001$), 95% confidence

interval (CI) is [0.112, 0.460], with a small to medium effect size ($f^2 = 0.112$), thus proving hypothesis H1. Regarding the specific components, the results showed that Relationship Capital had the strongest significant effect on the growth of sales ($\beta = 0.319$, $t = 4.006$, $p < 0.001$, 95% CI [0.162, 0.476], $f^2 = 0.145$), hence supporting hypothesis H4. The second in terms of significance is Human Capital ($\beta = 0.241$, $t = 2.587$, $p = 0.010$, 95% CI [0.059, 0.423], $f^2 = 0.088$), therefore, supporting H2. On the other hand, the contribution of Structural Capital in predicting Sales Growth was not significant ($\beta = 0.073$, $t = 1.121$, $p = 0.262$) and its CI was within the limits of the zero value (−0.054 to 0.200), the effect size was weak ($f^2 = 0.007$); therefore, H3 was rejected.

This lack of significance means that formalised processes, databases and internal infrastructure are not necessarily correlated to top-line revenue growth within the surveyed environment. In volatile markets or rapidly changing industries like Information Technology, heavy coding and strict workflows can lead to less agility and bureaucratic delays that prolong the time for products to go to market or customers to go to market. In addition, the internal systems are basic necessities that enable the company to run, but do not directly create new market demand or attract customers. Rather, commercial growth is dependent upon the individuals who use those systems and their market networks. Corporate Governance demonstrated a significant positive moderating effect ($\beta = 0.132$, $t = 2.053$, $p = 0.040$, 95% CI [0.006, 0.258], $f^2 = 0.028$), supporting H5. This again mirrors that good governance helps to turn intellectual capital into revenue. Sales Growth was the third variable, explaining 52.2% of the variance, which is considered moderate ($R2 = 0.522$; Table 5).

Table 4: Path Analysis

Hyp.	Relationship	Path Coeff. (β)	t-Value	p-Value	95% CI Lower	95% CI Upper	Effect Size (f2)	Decision
H1	Intellectual Capital → Sales Growth	0.286	3.214	0.001	0.112	0.460	0.112	Accepted
H2	Human Capital → Sales Growth	0.241	2.587	0.010	0.059	0.423	0.088	Accepted
H3	Structural Capital →	0.073	1.121	0.262	-0.054	0.200	0.007	Rejected

	Sales Growth							
H4	Relationship Capital → Sales Growth	0.319	4.006	< 0.001	0.162	0.476	0.145	Accepted
H5	Corp. Governance → Sales Growth	0.132	2.053	0.040	0.006	0.258	0.028	Accepted

Table 5: R Square

Endogenous construct	**R^2**	**Interpretation**
Sales Growth (SG)	0.522	Moderate explanatory power

5.Discussion

The findings show that the impact of intellectual capital is significant on the growth of sales in this research context ($\beta = 0.286$; $t = 3.214$; $p = 0.001$) and determines a moderate share of the variance of sales growth ($R^2 = 0.522$). This reinforces the case for the centrality of knowledge-based resources to value creation in a modern IT-driven economy. Previous research also indicates that intellectual capital positively impacts firm outcomes through increased innovation potential and market responsiveness [1], [8], [32]. The results also show that the relationship is not equal along all dimensions, suggesting a less straightforward pattern of the effects of intellectual capital than is typically found in studies at the aggregate level. Based on the IT industry case of Pakistan, firms that have more internal ICT resources appear to be better equipped to benefit from opportunities, adapt to a changing environment and sustain growth.

Human capital significantly and positively affects sales growth ($\beta = 0.241$, $t = 2.587$, $p = 0.010$), further emphasising that the skills and creativity of employees play a dominant role in competitive performance. This is consistent with Cabrilo, who claim that well-trained workers improve the output of innovation and responsiveness to customers in knowledge-intensive industries [4]. The results also align with Xu, who show that companies with more robust human capital can deliver better business performance [1]. In the IT industry, this translates to the fact that the number of

salespeople is significantly linked to their skills. It does highlight, however, an important implication for firms: that human capital can become too important to neglect and that the use of complementary organisational structures can substantially constrain scalability. In contrast, the level of structural capital did not have a significant impact on sales growth ($\beta = 0.073$, $t = 1.121$, $p = 0.262$), in conflict with the assumption of previous literature on the direct performance benefits of codified systems and routines.

The findings of present would imply these benefits to be more market-oriented than internal as expected by Shakri concerning structural capital [32]. First, a considerable number of companies in IT sector use more or less standard digital systems, flexible work approaches and clearly established procedures, thus state-of-the-art access to structural capital's competitive potential tends to be already relatively low and consequently their sales-outcomes' effect less. Instead, it could be more of a supporting factor strengthening human capital and relational capital and therefore indirectly increasing revenue. Second, the link between the positive external result-outcome effect and presence of structural capital, however, is not sufficient unless combined with high customers research interest or potential to implement innovation [13]. Therefore, the missing relationship may be explained by non-significant human capital and relational capital process.

Relationship capital turns out to be the most significant predictor of sales growth ($\beta = 0.319$, $t = 4.006$, $p<0.001$), indicating the influence of external networks, customer trust, and partnership quality. This aligns with Rabinovich focus on the newfound significance of relational assets for expanding revenue in competitive markets [8]. Likewise, Bagna conclude that intangible relational assets are strongly linked to the growth of the company, especially in-service businesses [9]. The results indicate that in the Pakistani IT industry, the growth in sales relies significantly on the ongoing relationship with the client and market embeddedness.

Finally, the relationship between intellectual capital and sales growth is still significantly moderated by corporate governance ($\beta = 0.132$; $t = 2.053$; $p = 0.040$), strengthening the assumption of agency theory. This reaffirms agency theory and recent literature on governance, which says that transparency, accountability and disciplined decision making are boundary conditions to maximise strategic value-facilitating function of firm resources [13], [14], [32]. However, the relatively small effect size ($f^2 = 0.028$) suggests that governance reinforces but does not control the link between intellectual capital and performance, meaning that governance is more of a factor to enable than a factor to lead to the growth outcome.

6. Implications of the Research

This study contributes to the literature by integrating intellectual capital, corporate governance, and sales growth into one framework within the emerging-market context of Karachi's IT sector. A major theoretical contribution is the finding that corporate governance strengthens the impact of intellectual capital on sales growth, extending earlier work that examined these variables separately. This supports Agency Theory and the Resource-Based View by showing that governance improves the efficient deployment of valuable resources and reduces managerial inefficiencies [27], [29]. The study also contributes by showing that human capital and relationship capital are the strongest drivers of sales growth, while structural capital alone may not directly increase revenue.

This refines prior intellectual capital literature by demonstrating that different IC dimensions do not contribute equally to market-based outcomes and may depend on complementary mechanisms to create growth [4]. From a practical perspective, the findings suggest that IT firms in Karachi should prioritise investment in skilled employees, continuous learning, and innovation capabilities. At the same time, firms should strengthen relationship management through customer engagement, trust-building, after-sales support, and strategic partnerships. The results also highlight the importance of governance structures that promote accountability, transparency, and long-term decision-making, which can improve both internal discipline and investor confidence.

In order for the deemed management teams of the Karachi IT Industry to realise the value application they will need to do the followings. Firstly, the managers will have to shed the conventionally sales pipeline models in bring black box IT method by institutionalising a KAM program on codified customer centric CRM analytics to determine the customers health scores and repeat referral. Also, since there are no staunch structural capital limits that bind the organisational human capital it will not need to addresses past inequities by move downwards through the definition of processes via the hierarchical adoption of the agile project team model outsourcing the part time web developers for flexibility for time-sensitive delivery. Lastly to union governance with performance IT executive should establish technological screening structure with centres of excellence to monitor project resource allocations by linking the executive level KPIs with the project top line build out in the Long run rather than the project immediate budget savings.

7. Policy Implications

The results have significant policy implications for bolstering the technology sector in Pakistan. Human capital development through education, specialisation, IT

training and skill-building activities should be promoted through public policy. Firms can enhance their ability and growth by investing in employee development and innovation. Besides, relationship capital fosters sales, policymakers should promote export promotion, international cooperation and market linkages to enable IT firms to grow outside. The study also indicates a need to continue governance reforms. Promoting transparency, accountability, ethical behaviour and robust regulation in the business will help increase firm credibility and support the efficient use of intellectual capital. Furthermore, enhanced digital infrastructure, cybersecurity regulations, and IP protection can further assist companies in converting intangible assets into better sales results.

8. Limitations and Future Research

This study has several limitations. First, its cross-sectional design limits causal interpretation because the data capture relationships at only one point in time. Future studies should adopt longitudinal designs to examine how intellectual capital and governance influence sales growth over time. Second, the study focuses only on Karachi's IT sector, which limits generalisability to other cities, industries, or countries. Future research may compare Karachi with other Pakistani cities such as Lahore and Islamabad, or with other emerging economies and sectors such as manufacturing, finance, or healthcare. Third, the use of purposive and convenience sampling may reduce external validity. Future studies may apply probability-based or stratified sampling techniques and may also use interviews or mixed methods to provide richer evidence.

Fourth, corporate governance was measured broadly, while governance itself is multidimensional. Future research may examine more specific governance mechanisms such as board structure, audit committees, executive compensation, shareholder rights, and ownership structure. Finally, future studies may test additional moderators and mediators such as leadership style, organisational culture, market dynamism, and external shocks, including technological disruption, regulatory change, and economic crises. These factors offer a broader and more dynamic understanding of how intellectual capital and corporate governance jointly shape firm performance in fast-changing business environments [4].

9. Conclusion

The purpose of the study was to analyse the mediating role of intellectual capital in the link between sales growth of IT firms in Karachi and the role of corporate governance. The results indicate that intangible resources play an integral role in firm performance in the knowledge intensive industries, but that is not the case in all aspects. Human capital and relationship capital were also identified, suggesting that

the quality of personnel and external connections are important factors in enabling companies to expand their sales and market presence. However, structural capital did not have a direct impact, indicating that internal systems and processes do not automatically result in market outcomes and must be validly tied to people and relationships. Corporate governance was shown to bolster the relationship between intellectual capital and sales development, indicating that accountability, transparency, and structured decision-making are linked to intellectual capital and firms' business outcomes.

The study has implications for the broader society, in addition to organisational performance. In developing countries like Pakistan, the IT industry plays a vital role in job creation, skill enhancement and economic modernisation. Indirectly, investment in human capital and effective governance practices benefits workforce development and professional capacity building within society. However, more developed relationship networks can also help boost business ecosystems through facilitating cooperation between businesses, clients and international markets, thereby fostering wider economic integration. Furthermore, better governance practices lead to higher levels of trust and good behaviour and to institutional stability, which are integral to the long-term development of society. Overall, the study shows that with good governance and strategic implementation, intellectual capital can serve not only as a driver for the firm's growth, but also for general socio-economic change.

References

[1] J. Xu, M. Haris, and F. Liu, "Intellectual capital efficiency and firms' financial performance based on business life cycle," *Journal of Intellectual Capital*, vol. 24, no. 3, pp. 653–682, 2023. doi: https://doi.org/10.1108/JIC-12-2020-0383

[2] A. Di Vaio, A. Zaffar, and M. Chhabra, "Intellectual capital through decarbonization for achieving Sustainable Development Goal 8: A systematic literature review and future research directions," *Journal of Intellectual Capital*, vol. 25, no. 7, pp. 54–86, 2024. doi: https://doi.org/10.1108/JIC-05-2024-0131

[3] D. Darmawan, "Human capital development in knowledge-based organization and continuous learning," *International Journal of Service Science, Management, Engineering, and Technology*, vol. 7, no. 1, pp. 1–6, 2025. doi: https://doi.org/10.62754/joe.v3i5.3938

[4] S. Cabrilo, S. Dahms, and F. S. Tsai, "Synergy between multidimensional intellectual capital and digital knowledge management: Uncovering innovation performance complexities," *Journal of Innovation & Knowledge*, vol. 9, no. 4, Art. no. 100568, 2024. doi: https://doi.org/10.1016/j.jik.2024.100568

[5] B. Tjahjadi, N. Soewarno, A. A. P. Sutarsa, and J. Jermias, "Effect of intellectual capital on organizational performance in the Indonesian SOEs and subsidiaries: Roles of open innovation and organizational inertia," *Journal of Intellectual Capital*, vol. 25, vol. 2-3, pp. 423–447, 2024. doi: https://doi.org/10.1108/JIC-06-2023-0140

[6] C. V. Pham, S. F. Liu, and S. H. Chen, "Corporate ESG performance and intellectual capital: International evidence," *Asia Pacific Management Review*, vol. 29, no. 3, pp. 306–346, 2024. doi: https://doi.org/10.1016/j.apmrv.2023.12.003

[7] L. Santioso, "The Effect Of Profitability, Company Size, Sales Growth And Leverage On Firm Value," *International Journal of Application on Economics and Business*, vol. 3, no. 1, pp. 299–309, 2025. doi: https://doi.org/10.24912/ijaeb.v3i1.299-309

[8] J. Rabinovich, "Tangible and intangible investments and sales growth of US firms," *Structural Change and Economic Dynamics*, vol. 66, pp. 200–212, 2023. doi: https://doi.org/10.1016/j.strueco.2023.05.001

[9] E. Bagna, E. C. Ramusino, S. Denicolai, and R. Strange, "Intangible assets and firm performance: The relative effects of recognized and unrecognized assets," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 10, no. 3, Art. no. 100356, 2024. doi: https://doi.org/10.1016/j.joitmc.2024.100356

[10] X. Guo, M. Li, Y. Wang, and A. Mardani, "Does digital transformation improve the firm's performance? From the perspective of digitalization paradox and managerial myopia," *Journal of Business Research*, vol. 163, Art. no. 113868, 2023. doi: https://doi.org/10.1016/j.jbusres.2023.113868

[11] A. Owolabi, M. M. Mousavi, G. Gozgor, and J. Li, "The impact of firm-level political risk on eco-innovation: The moderating effect of CEO power," *Business Strategy and the Environment*, vol. 34, no. 2, pp. 2650–2666, 2025. doi: https://doi.org/10.1002/bse.4124

[12] N. Huynh, Q. N. Le, and Q. T. Tran, "Firm-level political risk and intellectual capital investment: Does managerial ability matter?," *International Review of Financial Analysis*, vol. 91, Art. no. 103020, 2024. doi: https://doi.org/10.1016/j.irfa.2023.103020

[13] P. Gupta and S. Chauhan, "Dynamics of corporate governance mechanisms-family firms' performance relationship-a meta-analytic review," *Journal of Business Research*, vol. 154, Art. no. 113299, 2023. doi: https://doi.org/10.1016/j.jbusres.2022.113299

[14] A. Saleem, M. A. Sandhu, A. M. Hashmi, and A. Jamil, "The composite governance mechanisms and sustainable economic performance of Pakistan's textile industry," *PLOS ONE*, vol. 20, no. 2, Art. no. e0316388, 2025. doi: https://doi.org/10.1371/journal.pone.0316388

[15] M. Zareie, N. Attig, S. El Ghoul, and I. Fooladi, "Firm digital transformation and corporate performance: The moderating effect of organizational capital," *Finance Research Letters*, vol. 61, Art. no. 105032, 2024. doi: https://doi.org/10.1016/j.frl.2024.105032

[16] D. H. Vo and N. P. Tran, "Does digital transformation moderate the effect of intellectual capital on firm performance?," *Journal of the Knowledge Economy*, vol. 16, no. 2, pp. 9266–9288, 2025. doi: https://doi.org/10.1007/s13132-024-02270-8

[17] F. Masood, K. A. Channa, and S. M. M. Shah, "Knowledge sharing process and organizational performance: Mediating role of intellectual capital," *Knowledge and Process Management*, 2026. doi: https://doi.org/10.1002/kpm.70097

[18] M. Nadeem and A. Ejaz, "Corporate Governance Mechanism and Firm Performance: Evidence from Pakistan," *Social Science Review Archives*, vol. 3, no. 4, pp. 893–904, 2025. doi: https://doi.org/10.70670/sra.v3i4.1180

[19] F. Ahmad, "The relationship between intellectual capital, financial stability, firm performance, market value, and bankruptcy risk: Empirical evidence from Pakistan," *Journal of the Knowledge Economy*, vol. 16, no. 1, pp. 1347–1395, 2025. doi: https://doi.org/10.1007/s13132-024-02055-z

[20] C. C. Amitrano, M. Hani Gheith, C. Troise, and F. Cappa, "Individual and organizational intellectual capital, ESG dimensions and competitive advantage: A focus on Italian SMEs," *Journal of Intellectual Capital*, vol. 27, no. 1, pp. 89–109, 2026. doi: https://doi.org/10.1108/JIC-12-2024-0411

[21] C. Bettinelli, A. Sangermano, M. Bergamaschi, and M. Bennedsen, "Family firms' boards: A systematic review and research agenda," *Corporate Governance: An International Review*, vol. 33, no. 5, pp. 926–945, 2025. doi: https://doi.org/10.1111/corg.12631

[22] P. Thi Lan Anh and D. Thi Hai Yen, "Unpacking the moderating role of corporate governance in the foreign ownership and corporate risk-taking relationship:

Insights from fsQCA," *Cogent Business & Management*, vol. 12, no. 1, Art. no. 2468370, 2025. doi: https://doi.org/10.1080/23311975.2025.2468370

[23] S. Rosalin, K. Raharjo, H. N. Utami, and A. Prasetya, "Optimizing competitive advantage of Indonesian startups: A study on the relationship between managerial capability, digital marketing, and business resilience," *Cogent Business & Management*, vol. 13, no. 1, Art. no. 2672812, 2026. doi: https://doi.org/10.1080/23311975.2026.2672812

[24] P. T. Tam, "Applied Data Science for Testing the Impact of Intangible Resources on Business Performance of SMEs," *Journal of Applied Data Sciences*, vol. 7, no. 1, pp. 458–474, 2026. doi: https://doi.org/10.47738/jads.v7i1.1137

[25] A. U. Musawir, "Revisiting the principal–agent framework in the context of projects: Drawing parallels with corporate governance," *Project Management Journal*, vol. 56, no. 1, pp. 41–56, 2025. doi: https://doi.org/10.1177/87569728241270572

[26] B. Wernerfelt, "A resource-based view of the firm," *Strategic Management Journal*, vol. 5, no. 2, pp. 171–180, Apr.–Jun. 1984. doi: https://doi.org/10.1002/smj.4250050207.

[27] J. B. Barney, "Firm resources and sustained competitive advantage," *Journal of Management*, vol. 17, no. 1, pp. 99–120, Mar. 1991. doi: https://doi.org/10.1177/014920639101700108.

[28] S. Bhattacharjee and R. Akter, "Intellectual capital efficiency and firm performance: Evidence from an emerging knowledge-economy," *International Journal of Learning and Intellectual Capital*, vol. 19, no. 1, pp. 30–52, 2022. doi: https://doi.org/10.1504/IJLIC.2022.119284.

[29] M. C. Jensen and W. H. Meckling, "Theory of the firm: Managerial behavior, agency costs and ownership structure," *Journal of Financial Economics*, vol. 3, no. 4, pp. 305–360, Oct. 1976. doi: https://doi.org/10.1016/0304-405X(76)90026-X.

[30] O. E. Njoku and Y. Lee, "Agency Costs, Ownership Structure, and Cost Stickiness: Implications for Sustainable Corporate Governance," *Sustainability*, vol. 17, no. 11, Art. no. 5144, 2025. doi: https://doi.org/10.3390/su17115144

[31] M. U. Arshad, R. U. R. Memon, W. Anwar, F. H. Tunio, and P. J. Silveira Ferreira, "Nexus between intellectual capital and sustainable growth: Moderating roles of military-experienced CEOs and sustainable corporate governance," *Sustainability*, vol. 16, no. 23, Art. no. 10533, 2024. doi: https://doi.org/10.3390/su162310533

[32] I. H. Shakri, J. Yong, and E. Xiang, "Corporate governance and firm performance: Evidence from political instability, political ideology, and corporate governance reforms in Pakistan," *Economics & Politics*, vol. 36, no. 3, pp. 1633–1663, 2024. doi: https://doi.org/10.1111/ecpo.12303

[33] K. Akinsola, "The role of corporate governance in strengthening compliance frameworks," SSRN, Paper 5126938, 2025. doi: https://dx.doi.org/10.2139/ssrn.5126938

[34] A. B. Tulcanaza-Prieto, Y. Lee, and W. Anzules-Falcones, "The moderating role of corporate governance in the relationship between leverage and firm value: Evidence from the Korean market," *Risks*, vol. 12, no. 1, Art. no. 11, 2024. doi: https://doi.org/10.3390/risks12010011

[35] M. N. K. Saunders, P. Lewis, and A. Thornhill, *Research Methods for Business Students*, 8th ed. New York, NY, USA: Pearson, 2019. [Online]. Available: https://www.perlego.com/book/971477/research-methods-for-business-students-pdf

[36] J. Novielli, L. Kane, and A. R. Ashbaugh, "Convenience sampling methods in psychology: A comparison between crowdsourced and student samples," *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement*, vol. 57, no. 3, Art. no. 229, 2025. doi: https://psycnet.apa.org/doi/10.1037/cbs0000394

[37] W. G. Cochran, *Sampling Techniques*, 3rd ed. New York, NY, USA: Wiley, 1977.

[38] M. Subramaniam and M. A. Youndt, "The influence of intellectual capital on the types of innovative capabilities," *Academy of Management Journal*, vol. 48, no. 3, pp. 450–463, 2005. doi: https://doi.org/10.5465/amj.2005.17407911

[39] N. Bontis, "Intellectual capital: An exploratory study that develops measures and models," *Management Decision*, vol. 36, no. 2, pp. 63–76, 1998. doi: https://doi.org/10.1108/00251749810204142

[40] M. A. Youndt, M. Subramaniam, and S. A. Snell, "Intellectual capital profiles: An examination of investments and returns," *Journal of Management Studies*, vol. 41, no. 2, pp. 335–361, 2004. doi: https://doi.org/10.1111/j.1467-6486.2004.00435.x

[41] M. R. Islam, "Research ethics in social science: An overview," in *Ethics in Social Science Research: Current Insights and Practical Strategies*, Cham, Switzerland: Springer, 2025, pp. 1–19. doi: https://doi.org/10.1007/978-981-97-9881-0_1

[42] J. F. Hair Jr, G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, and S. Ray, "Evaluation of reflective measurement models," in *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*, Cham, Switzerland: Springer International Publishing, 2021, pp. 75–90. doi: https://doi.org/10.1007/978-3-030-80519-7_4

[43] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18, no. 1, pp. 39–50, 1981. doi: http://dx.doi.org/10.2307/3150980

[44] M. R. Ab Hamid, W. Sami, and M. H. Mohmad Sidek, "Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion," in *Journal of Physics: Conference Series*, vol. 890, no. 1, Sep. 2017, Art. no. 012163. doi: https://doi.org/10.1088/1742-6596/890/1/012163