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Regional GDP as a moderator between intellectual capital and marketing performance: Evidence from Chinese SMEs

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ABSTRACT

Intellectual capital is a crucial driver of competitiveness; however, its role in shaping the marketing performance of small and medium-sized enterprises (SMEs) across diverse regional contexts remains insufficiently understood. This study utilizes survey data from 78 Chinese SMEs and employs partial least squares structural equation modeling (PLS-SEM) to examine the effects of five dimensions of intellectual capital on marketing performance. Additionally, it investigates the moderating role of regional gross domestic product (GDP). The results indicate that informational and structural capital significantly enhance marketing performance, whereas regional GDP does not exert a moderating effect. These findings suggest that internal intangible resources are more critical than external economic conditions in driving SME marketing success. The study extends research on intellectual capital to include SME and regional contexts and offers practical insights for prioritizing intangible assets within marketing strategies.

Contribution/ Originality: This study contributes to the existing literature by examining intellectual capital in regionally imbalanced Chinese SMEs. It employs a novel estimation methodology based on PLS-SEM. Additionally, this research is among the few studies that investigate how intangible assets influence marketing performance across diverse regional economic contexts.

1. INTRODUCTION

In today's rapidly changing corporate environment, the significance of intangible assets and resources has garnered widespread attention from academia, the business sector, and regulators. The resource-based view (RBV) hypothesis offers an important theoretical framework for understanding how these intangible assets influence organizational performance. It posits that a company's competitive advantage and marketing success are determined by its unique and valuable resources and capabilities, particularly intellectual capital (Jahangir & Sangmi, 2023). As a dynamic and rapidly expanding economy, China's numerous businesses face the challenge of managing and leveraging internal intellectual resources in an era characterized by global competition, technological advancement, and rapidly changing consumer preferences. The significant contribution of Chinese companies to GDP and employment underscores the importance of effectively utilizing various intellectual assets, including human, structural, relational, informational, and social capital (Ibarra-Cisneros, Hernández-Perlines, & Rodríguez-García, 2020).

The increasing emphasis on intellectual capital (IC) as a key driver of competitive advantage and marketing performance has transformed organizational strategies, especially for small and medium-sized enterprises (SMEs) in

China. The country is experiencing an unprecedented surge in SME growth and a rapid shift toward a knowledge-based economy. While the Resource-Based View (RBV) highlights the importance of intangible resources for firm success, there are significant gaps in understanding how these multidimensional components of intellectual capital specifically influence marketing performance within China's unique socioeconomic context. Existing research remains fragmented, with a disproportionate focus on innovation and financing, and lacks detailed insights into the interaction between intellectual capital dynamics and regional economic disparities, such as the moderating effect of regional GDP. This oversight leaves SMEs ill-prepared to tackle challenges like resource limitations and suboptimal cross-regional strategies, thereby hindering their ability to leverage intellectual capital for sustainable growth.

This study aims to investigate the impact of intellectual capital on marketing performance, primarily utilizing the resource-based view theory. Internal resources are crucial in establishing competitive advantages for corporations. By focusing on intellectual capital as the primary research variable, the study explores how businesses can enhance their marketing competitiveness through effective internal knowledge management and capability development. Marketing performance, as a key indicator of corporate competitiveness and sustainable growth, more intuitively reflects a company's success in brand building, customer relationship management, and market expansion. These areas are significant scenarios where intellectual capital can play a vital role in driving organizational success (Tsou, Chen, & Liao, 2016).

Furthermore, the study selected regional GDP as a moderating variable over other potential factors, primarily because regional GDP determines the marketing environment and consumer purchasing power, thereby directly influencing the effectiveness of corporate marketing activities. In a country like China, where regional economic development levels vary significantly, regional GDP as a macro-moderating variable can better explain the heterogeneity of the role of intellectual capital on marketing performance across different economic backgrounds. It also provides a theoretical basis for companies to allocate resources and make strategic decisions based on local conditions (Baikuni, Dafik, Poernomo, & Sisbintari, 2022).

This study addresses these gaps by investigating three critical dimensions: (1) the specific impact of IC subtypes (human, relational, structural, social, and informational capital) on marketing success; (2) the moderating effect of regional GDP in shaping this relationship. By bridging theoretical and practical gaps, the research aims to empower policymakers and business leaders to harness intellectual capital as a catalyst for resilience and competitiveness in China's evolving marketing landscape.

2. LITERATURE REVIEW

2.1. Marketing Performance

Marketing performance, defined as the extent to which organizations fulfill their marketing goals, has been extensively researched in both financial and non-financial terms. However, research relating to intellectual capital and marketing performance remains scattered, which often confronts resource restrictions and operates in turbulent situations (Ahmad, 2025). While research in developed economies has examined how intellectual capital promotes innovation and strategic differentiation, less attention has been paid to its application in emerging economies such as China, where the unique interplay of marketing conditions and policy incentives creates distinct challenges and opportunities.

Marketing performance measures a company's effectiveness in promoting its products, reflected in metrics such as product success, sales growth, and annual profits (Narver & Slater, 1990). Traditionally, financial indicators such as profit and sales were the primary measures; however, modern approaches incorporate non-financial metrics such as customer satisfaction, loyalty, and brand equity (Ambler et al., 2002; Clark, 1999). Companies increasingly focus on intellectual capital, including human, structural, and relational capital, as a driver of marketing performance (Ahangar, 2011). Research suggests that firms with strong intellectual capital tend to achieve higher profitability and innovation levels (Xu & Wang, 2019). Intellectual capital also enhances risk management, customer loyalty, and long-

term sustainability (Shahbaz & Malik, 2025). However, some studies indicate that while human capital contributes positively to firm performance, structural and relational capital may have limited effects. In emerging economies, research on the role of intellectual capital in marketing performance remains limited (Dženopoljac, Kwiatek, & Rauf, 2021). However, evidence suggests that firms leveraging intellectual capital effectively can gain a competitive edge and improve overall performance through innovation and marketing positioning (Kweh, Lu, Tone, & Nourani, 2022).

2.2. Intellectual Capital

Existing research suggests that intellectual capital helps firms overcome resource constraints by encouraging innovation, flexibility, and customer-centric initiatives (Bontis & Fitz-enz, 2002; Youndt, Subramaniam, & Snell, 2004). However, there are still gaps in our understanding of how the various components of intellectual capital such as human, structural, and relational capital interact to influence marketing performance within firms, particularly when regional economic contributions, like gross domestic product (GDP), are considered.

Intellectual capital was once regarded as an intangible asset but has evolved into a key driver of value creation and sustainability. It encompasses non-material factors influencing the economy, including relationships, knowledge, and innovation. Intellectual capital highlights the latent potential of individuals, businesses, and nations in shaping economic, social, and environmental progress (Alvino, Di Vaio, Hassan, & Palladino, 2021). Stewart (1997) defines intellectual capital as the collective reservoir of knowledge, intellectual property, organizational learning, customer relationships, and brand assets contributing to a company's value. Typically, intellectual capital consists of three components: human capital (skills, knowledge, and expertise), structural capital (organizational processes, intellectual property, and systems), and relational capital (external networks and stakeholder relationships). These elements enable businesses to innovate, adapt, and sustain performance in volatile markets.

Human capital refers to employees' expertise and experience, which drive organizational effectiveness, problem-solving, and innovation (Mubarik, Chandran, & Devadason, 2018). Investing in education, health, and training enhances productivity and economic growth (Manzari, Kazemi, Nazemi, & Pooya, 2012). Economists like Schultz and Becker emphasize continuous learning as a source of flexibility and competitiveness (Buşoi, 2014). Studies show a positive correlation between human capital and business success, particularly in firms that prioritize employee development.

Relational capital, which includes relationships with suppliers, customers, and stakeholders, directly affects company performance indicators such as cost reduction and revenue growth. Strong external networks enhance financial performance, customer satisfaction, and loyalty. Companies leverage relational capital through customer relationship management to strengthen brand image and investor confidence. Strategic partnerships foster innovation by facilitating knowledge exchange and risk-sharing.

Structural capital encompasses organizational infrastructure, intellectual property, and systems that support human capital (Hejazi, Ghanbari, & Alipour, 2016). Effective knowledge management and streamlined processes enhance productivity and decision-making. Research indicates that investments in R&D and digital transformation strengthen the impact of structural capital on business performance (Bayraktaroglu, Calisir, & Baskak, 2019). Intellectual property rights provide competitive advantages by protecting innovation.

Informational capital, which includes strategic resources from data and knowledge management, enhances efficiency and decision-making in addition to the conventional intellectual capital framework (Seethamraju, 2015). Companies investing in IT systems gain competitive advantages in data-driven marketing. Social capital, which includes networks and shared values that foster collaboration and trust, influences corporate relationships, reduces transaction costs, and supports long-term business sustainability (Nahapiet & Ghoshal, 1998).

Intellectual capital has become a key factor in business resilience and marketing competitiveness. Research shows that intellectual capital plays a crucial role in helping companies withstand financial crises and sustain growth (Edvinsson, 2013; Haji, 2014). Successful firms, such as Apple and Google, leverage intellectual capital for long-term

marketing leadership. In developing economies like China, intellectual capital influences industry innovation and macroeconomic conditions.

Investing in intellectual capital enhances profitability by optimizing processes and expanding revenue sources through innovation. Digital expertise has become essential for businesses to adapt to technological advancements, particularly in e-commerce and digital marketing.

Governments and investors increasingly recognize the value of intellectual capital, prompting its inclusion in financial reporting in certain industries and regions. Unlike physical assets, intellectual capital appreciates over time when effectively managed, providing firms with sustained competitive advantages and long-term growth potential (Susanne et al., 2013).

2.3. The Moderating Effect of Regional GDP

GDP reflects the overall economic performance of a country or region. In a growing economy with a high GDP, businesses tend to have more resources, consumer confidence is usually higher, and there may be greater demand for goods and services (Van Stel, 2005). Many studies believe that GDP is significantly and positively correlated with corporate performance and has a positive impact on corporate marketing sales under favorable economic cycles and economic growth (Dollar, Hallward-Driemeier, & Mengistae, 2005). At the same time, under favorable economic conditions, the per capita income of consumers will increase, and the variety of goods they purchase will also expand, thereby promoting improvements in marketing performance.

GDP's comprehensive representation of the entire economic landscape makes it a frequently referenced indicator for various economic elements. A strong and stable GDP is conducive to achieving superior firm performance. It measures the growth rate of the overall value of all goods and services produced within an economy for consumption. This indicator is widely used in literature to assess economic growth (Egbunike & Okerekeoti, 2018). During periods of economic uncertainty or downturns, consumers may become more cautious with their spending and prioritize essential purchases. This situation requires marketers to adapt their strategies to meet changing consumer needs and preferences. It is important to note that while GDP can provide an overall economic context, marketing performance is influenced by a multitude of factors beyond GDP alone. These factors include industry dynamics, target market characteristics, competitive strategies, product quality, brand perception, and marketing execution, all of which play significant roles in determining marketing success (Sudirjo, 2023). Therefore, while GDP can serve as a useful indicator, it should be considered alongside other relevant factors to gain a comprehensive understanding of marketing performance. The overall economic conditions of a country, as reflected by GDP, can influence the relationship between intellectual capital and marketing performance (Mutuc & Cabrilo, 2022).

3. RESEARCH HYPOTHESES AND MODEL OF STUDY

3.1. Relationship Between Intellectual Capital and Marketing Performance

3.1.1. Human Capital

Human capital encompasses employees' skills, knowledge, creativity, and expertise, serving as a crucial driver of innovation, service quality, and customer satisfaction. Firms with skilled and motivated employees are more likely to excel in marketing performance by adapting to marketing changes, developing innovative products, and enhancing customer experiences (Hatch & Dyer, 2004; Wright, Dunford, & Snell, 2001). Some studies suggest that excessive or misaligned investments in human capital (e.g., over-training, hiring highly skilled but costly employees) can negatively affect marketing performance due to increased costs, inefficiencies, or a mismatch with marketing objectives (Huselid & Becker, 1996). Human capital often has a positive effect on overall firm performance; however, the effect size varies across different contexts and can be non-significant in specific areas such as marketing performance. The study suggests that the impact of human capital might be diluted by factors such as industry type

or the inability to directly link skills to marketing outcomes, including brand equity or sales growth (Crook, Todd, Combs, Woehr, & Ketchen Jr, 2011). Therefore, we propose the following assumptions:

H_1: Human capital has a significant positive effect on marketing performance.

3.1.2. Structural Capital

Structural capital, encompassing organizational systems, processes, and intellectual property such as patents and trademarks, is a crucial component of intellectual capital. It provides the foundational infrastructure for efficient operations and innovation. Research suggests that firms with strong structural capital optimize internal processes, manage knowledge effectively, and leverage technological advancements, all contributing to improved marketing performance (Subramaniam & Youndt, 2005).

Firms recognize structural capital as essential for supporting employees, optimizing intellectual performance, and enhancing marketing performance. This includes operational systems, manufacturing processes, organizational culture, management philosophy, and intellectual property (Beltramino, García-Perez-de-Lema, & Valdez-Juárez, 2020). However, findings from the Korean manufacturing survey indicate that structural capital has limited direct effects on firm performance. This suggests that manufacturing firms should maintain a clear knowledge strategy, leverage information systems, foster a creative organizational culture, and implement other relevant initiatives. Research highlights that a well-structured organization with knowledgeable staff enhances institutional performance by delivering high-quality, efficient services (Almasarweh, Alnawaiseh, Alsaraireh, & Al Wadi, 2019). It finds that structural capital (e.g., organizational infrastructure) has a non-significant direct impact on new product development (NPD) performance unless mediated by organizational learning. This implies that structural capital's contribution to marketing performance may be weak or negligible without adaptive learning processes to align it with market needs (Hsu & Fang, 2009). Based on this discussion, the hypothesis is as follows:

H_2: Structural capital has a significant positive effect on marketing performance.

3.1.3. Relational Capital

Relational capital, defined as the value inherent in a company's relationships with external stakeholders such as suppliers, customers, and other key constituencies, has been increasingly recognized as a critical component of intellectual capital that can influence company performance (Martini, Corvino, Doni, & Rigolini, 2016). Relational capital likely influences business performance metrics, including revenue growth and cost reduction. Evidence suggests mechanisms such as process improvements, economies of scale, and enhanced customer relationships contribute to these effects. The significance and magnitude of these impacts may vary; some studies indicate a direct correlation with cost reduction, while others demonstrate broader implications for overall financial performance.

Strong relational capital enables firms to build trust, foster collaboration, and create value through strategic alliances and customer loyalty. Research indicates that firms with well-developed relational capital are better positioned to access marketing opportunities, enhance brand reputation, and achieve sustainable competitive advantages (Nahapiet & Ghoshal, 1998; Yli-Renko, Autio, & Sapienza, 2001). Several empirical studies provide insights into the relationship between relational capital and performance indicators. Additional research suggests that SME networks mediate the relationship between relational capital and marketing performance. Relational capital has little direct impact on marketing performance. This indicates that customer capital, supplier capital, and employee networks have an indirect impact on marketing performance (Febrian, Sukresna, & Ghozali, 2020). Customer retention, a component of relational capital, did not have a significant impact on marketing effectiveness among SMEs in Indonesia's Bantul region. This indicates that, under certain circumstances, characteristics of relational capital, such as sales or market share, may be ineffective in enhancing marketing success. (Farida, Nyoman, & Taufiq, 2021). The hypothesis is as follows:

H_3: Relational capital has a significant positive effect on marketing performance.

3.1.4. Informational Capital

Many observers have noted the importance of sharing information for entrepreneurship and economic growth (Dabbous & Tarhini, 2021). The concept of informational capital was proposed in 1962 and gradually developed. In 1962, American economist George J. Stigler pointed out that information is an asset cost, which is generated on the basis of search costs (Lippman & McCall, 1993). In 1977, American information economist Mac Uri Porat proposed that informational capital refers to investments in various types of information equipment related to information services. These services and products can be utilized as part of social information activities or included in information investments as consumables of information (Cortada, 1998). Although open access to information, especially more recently via the internet, offers a variety of communication opportunities, information is critical to the efficient functioning of capital markets and is a potentially important means by which management communicates company performance and governance to outside investors (Healy & Palepu, 2001). Informational capital is often affected by cyber-attacks, marketing competition, and social media. Information spreads like a virus, and businesses benefit from it during the spreading phase. Companies must provide responsive services as digitalization rapidly develops (Purwanto, Purba, Bernarto, & Sijabat, 2023). In 2004, Kaplan and Norton (2004) proposed that informational capital is the raw material for creating value in the new economy, including systems, databases, book resources and network resources. Informational capital consists of two parts: technology infrastructure and applications, which are considered only within the strategic context of value (Melville, Kraemer, & Gurbaxani, 2004).

People can process roughly seven bits of information, according to Miller (1994), but Malhotra (1982) demonstrated that when consumers are presented with ten or more options, information overload can have negative consequences. Customers lack trust in their purchasing judgments when confronted with an abundance of information (Hiltz & Turoff, 1985). Consequently, consumers' assessments of each choice are negatively correlated with the quantity of alternatives available, which ultimately results in less effective decision-making (Keller & Staelin, 1987). However, gaps remain in the research on informational capital in company marketing performance, particularly concerning the externalization of informational capital and its influence on marketing activities and overall marketing performance, which is the focus of this study. Investment in informational capital has not succeeded in boosting marketing success in the short term; instead, it has increased costs (Germann, 2013). Excessive or incorrect use of informational capital may disrupt the execution of marketing initiatives (Wilden & Gudergan, 2015). Therefore, the hypothesis is as follows：

H_5: Informational capital has a significant positive effect on marketing performance.

3.1.5. Social Capital

Social capital is an important component in improving marketing performance (Setini, 2022). It should be noted that the relationship between technical social capital and corporate marketing performance is complex and interrelated and is also affected by factors such as marketing demand, technical capabilities, brand positioning, and competitive environment (Yli-Renko et al., 2001). Bourdieu defined social capital as 1) the relationships that provide resources, and 2) the quality and quantity of those resources, with social capital convertible to economic capital under certain conditions (Madda, 2023). Social capital promotes the creation of new intellectual capital; precisely because of its denser social capital, firms have an advantage over marketing in creating and sharing intellectual capital within certain limits. (Barrutia & Echebarria, 2022). The building blocks of social capital are trust, norms, and networks. A key property of social capital relies on the transitivity of trust. The significance of supplier relationships has increased due to the rapid evolution of technology products, surpassing the iterative capacity of companies. For intricate products, suppliers not only function as partners with leading firms but also autonomously develop and implement new technologies. Uzzi's research on interfirm networks highlights that high levels of social capital (e.g., tight-knit relationships) can negatively affect performance by fostering over-embeddedness. In marketing, this could mean that firms overly reliant on existing social ties fail to reach new customer segments or innovate in their strategies, leading

to suboptimal marketing outcomes (Uzzi, 1997). While it finds a generally positive link, it also notes cases where the relationship with performance outcomes is non-significant, particularly when networks fail to align with strategic goals. In a marketing context, this could imply that internal social capital (e.g., team cohesion) does not always enhance external marketing performance if it does not directly improve customer-facing results (Tsai, 1998). Therefore, my hypothesis is as follows：

H_5: Social capital has a significant positive effect on marketing performance.

3.2. The Moderation Effect of Regional GDP

Although Weckroth and Kemppainen (2016) discovered a substantial correlation between regional GDP and human capital values like autonomy and independent thought, their findings did not directly support the idea that GDP controls market performance and human capital. According to Pelinescu (2017) research, macro-regional GDP growth is significantly positively impacted by human capital. Regional intellectual capital has a greater impact on economic growth than human capital. Furthermore, without mentioning the moderating role of regional GDP, Sabra (2024) stated that human capital management, which includes training, experience, skills, and knowledge, has a large direct impact on marketing success. Additionally, the contribution of human capital investment to enhancing the performance of agricultural enterprises is more significant under active marketing strategies. This suggests that internal corporate strategies, rather than regional GDP, may have a greater influence on the relationship between human capital and marketing performance. The study finds that the direct effect of human capital on performance is robust, but moderation by macroeconomic factors such as GDP growth is often non-significant across contexts (Crook et al., 2011). Therefore, my hypothesis is as follows:

H_6: Regional GDP moderates the relationship between human capital and marketing performance.

According to Januškaitė and Užienė (2018), intellectual and structural capital play a significant role in regional economic development, accounting for 29.9% of GDP growth. Likewise, Tjahjadi, Shanty, and Soewarno (2019) demonstrated that structural capital influences marketing performance, which in turn affects financial performance. This relationship may be indirectly mediated by regional GDP, which impacts company innovation and manufacturing capacities. However, Keelson et al. (2024) showed that macroeconomic variables like GDP do not significantly affect SMEs' market performance; therefore, they do not support regional GDP as a moderating factor. Chen, Cheng, and Hwang (2005) included GDP growth as a contextual variable, but their findings indicate that it has no significant moderating effect on the relationship between structural capital and performance in many models. Consequently, it is hypothesized that regional GDP will moderate the relationship between structural capital and marketing performance.

H_7: Regional GDP moderates the relationship between structural capital and marketing performance.

The contribution of relational capital to business market performance may be impacted by regional economic conditions. Cooke, Clifton, and Oleaga (2005) discovered, for instance, that the usefulness of relational capital differed depending on the regional economic context. The moderating effect of regional GDP was further supported by Agostini, Nosella, and Soranzo (2017), who demonstrated that the relationship between relational capital and customer performance changed with regional economic conditions (GDP). However, Kohtamäki, Vesalainen, Henneberg, Naudé, and Ventresca (2012) noted that internal relationships and investments, rather than external economic conditions such as GDP, are the primary determinants of relational capital's impact on business success. Jardón and da Silva (2023) analysis of the lumber industry revealed that relational capital's effect on company performance was largely constant and unaffected by variations in GDP. Furthermore, Nuryakin and Ardyan (2018) demonstrated that while regional GDP has no discernible impact on market performance, the relational capital of SMEs does. Griffith and Lusch (2007) investigated the impact of relational capital (e.g., customer and partner relationships) on business performance, including marketing outcomes, in both the United States and Japan. GDP growth is included as an institutional factor, but its moderating influence on the relationship between capital and

performance is shown to be non-significant in both samples. This lends credence to the theory that GDP has little effect on marketing performance. Therefore, it is hypothesized that regional GDP will not significantly moderate the relationship between relational capital and marketing performance.

H_8: Regional GDP moderates the relationship between relational capital and marketing performance.

Weckroth and Kemppainen (2016) found that independent thinking and innovative capabilities, the core elements of informational capital, are important indicators of regional GDP. Further supporting the possible moderating effect of regional GDP, Pucci, Simoni, and Zanni (2015) noted that the relationship between marketing assets, intellectual capital, and company performance is influenced by regional economic conditions. Conversely, research that refutes the moderating influence of regional GDP provides evidence to the contrary. Instead of regional GDP, it was found that the enterprise's internal information capital management is the primary factor influencing marketing performance. Additionally, Thompson and Slaper (2016) demonstrated that industry structure and the legislative environment have a greater influence on the role of information capital on marketing performance than does reliance on regional GDP. Therefore, it is hypothesized that regional GDP will moderate the relationship between informational capital and marketing performance, with stronger effects observed in economically developed regions.

H_9: Regional GDP moderates the relationship between informational capital and marketing performance.

According to Thompson and Slaper (2016), certain aspects of social capital, such as citizenship and organizational participation, have a positive impact on GDP growth and employee pay. The moderating effect of regional GDP was further supported by Bronisz and Heijman (2010) analysis of Polish regions, which revealed that the positive influence of social capital on regional economic performance is more pronounced in high GDP regions. Cooke et al. (2005) noted that business networks, not regional GDP levels, are the primary determinant of social capital's effect on corporate performance. Regional GDP does not significantly influence the relationship between social capital (e.g., community organization and trust level) and performance, as demonstrated by Andrews and Wankhade (2015). Furthermore, Pan and He (2010) analysis of Chinese provinces revealed that while social capital has a limited direct interactive relationship with GDP, its effects vary greatly among regions. Thus, the following hypothesis is postulated：

H_{10}: Regional GDP moderates the relationship between social capital and marketing performance.

3.3. The Model of Study

The resource-based view (RBV) helps explain the essence of regional GDP by acting as a moderator between intellectual capital and marketing performance. Wernerfelt (1989) defines company resources as any aspects that reflect the organization's basic competitiveness, including tangible and intangible assets. Barney (1991) extended this concept by emphasizing the importance of strategic choice. He stated that the primary strategic goal of company management is to identify, develop, and deploy critical resources with heterogeneity to maximize operating returns. China exhibits imbalanced regional economic development, which significantly influences the composition of external and internal resources. External factors include geographical variables and policy influences, while internal factors encompass talent resources, relationship networks, and intellectual capital. Based on this understanding, the integration of regional GDP with intellectual capital and marketing performance results in the following effect model:

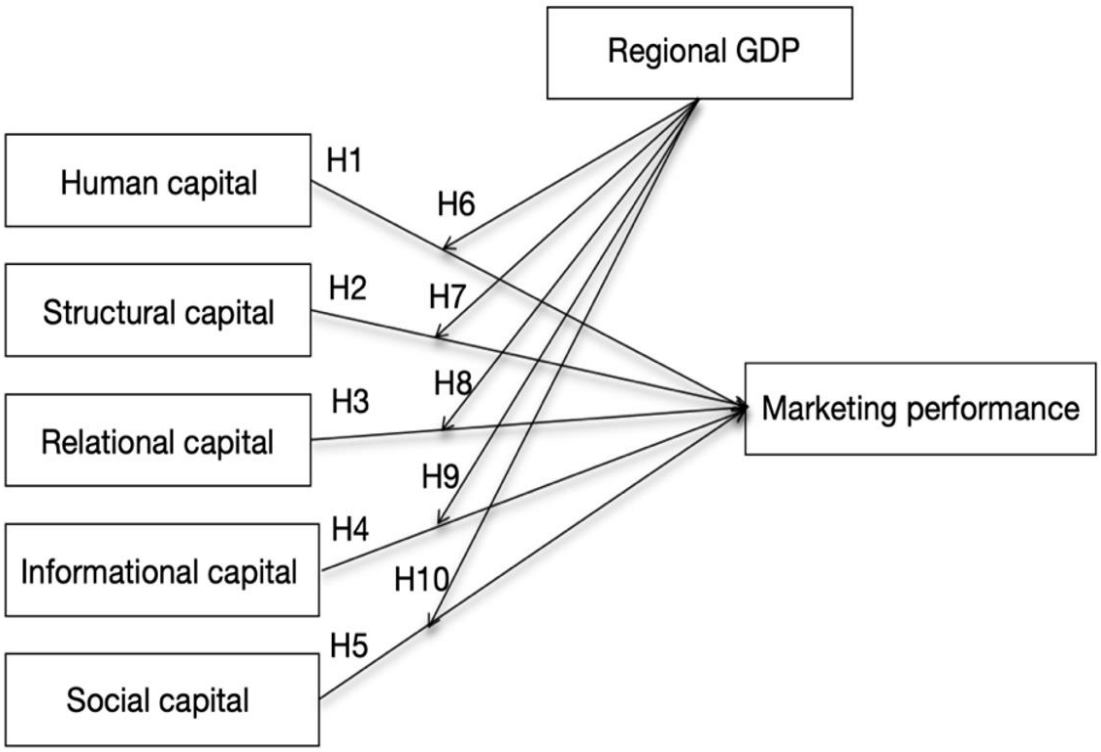

Figure 1. The model of the study.

Figure 1 illustrates the effects of regional GDP on the five dimensions of intellectual capital and marketing performance.

4. METHODOLOGY

4.1. Research Design

This study aims to investigate the impact of intellectual capital (independent variable) on the marketing performance of SMEs (dependent variable), as well as the moderating role of regional GDP in this relationship. The research employs a quantitative methodology and is designed as a cross-sectional survey to assess the levels of intellectual capital and marketing performance among Chinese firms at a specific point in time. Participants primarily include marketing managers or relevant personnel responsible for corporate marketing decisions within Chinese firms, who possess a comprehensive understanding of the composition and application of intellectual capital.

This study employs a convenience sampling approach. Qualified marketing managers from various firms are pre-screened and invited to participate in the survey through industry associations, corporate databases, and online questionnaire platforms. To ensure data diversity and representativeness, participating companies are distributed across different regions to better reflect the moderating effect of regional economic development levels on the relationship between intellectual capital and marketing performance. All participants provided relevant data via a standardized questionnaire that included information on the composition of corporate intellectual capital, marketing performance metrics, and macroeconomic indicators for the company's location.

During the data collection stage, 78 valid questionnaires were gathered, each representing the scenario of a small to medium-sized firm. Despite the limited sample size, we aim to ensure internal consistency and the effectiveness of analysis through careful questionnaire design and data quality control. The research findings can provide preliminary empirical evidence for investigating the impact mechanism of intellectual capital on the marketing performance of small and medium-sized companies, as well as the effect of regional economic regulation. Additionally, these findings offer theoretical support and a methodological basis for future sample size expansion and model validation.

4.2. Measurement Instruments

The questionnaire design is based on well-established academic literature and reliable institutional sources, ensuring conceptual validity and methodological rigor. The core components of human capital dimensions, such as experience (8 items), education/knowledge (3 items), and skills (3 items), were adopted from validated instruments created by Dar and Mishra (2019). Relational capital measurements (12 items) are based on Verde, Castello, and Sánchez (2011) operational framework, whereas structural capital components, which include systems/programs, R&D, and intellectual property rights (30 items), are based on Al-Hawajreh (2013) complete scale. Informational capital measures (4 items) are based on Cui, Hu, and Griffith (2014) validated indicators and are supplemented by Lin and Lu (2011) multidimensional social capital assessment, which includes structural, relational, and cognitive dimensions (10 total items). Marketing performance evaluation incorporates both financial (7 elements) and non-financial variables (7 items), as per Abrokwah-Larbi (2022) and Eneizan (2018). Control variables such as industry classification, organizational size, and economic background indicators were operationalized using established definitions provided by China's National Bureau of Statistics. This multi-source strategy maintains theoretical consistency with existing scholarship while retaining contextual relevance via official statistics benchmarks.

The questionnaire was meticulously designed by integrating theoretical constructs from the literature review with practical insights. The measurement tool was adapted and customized to align with the specific context of this study. During the questionnaire development process, it was anticipated that the responses would provide valuable insights into respondents' understanding of the concept of corporate intellectual capital and its impact on marketing performance. To enhance the quality of the questions, feedback was solicited from nine experts in the field, leading to revisions that improved the clarity, readability, and comprehensiveness of the items. Care was taken to avoid ambiguous, awkward, or leading questions, ensuring the reliability and validity of the instrument.

To further refine the questionnaire, a pre-test was conducted with eight employees from various Chinese companies. This pre-test aimed to identify potential issues related to question wording, structure, or interpretation. The final questionnaire employed a five-point Likert scale, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." Respondents were required to select one of the five options for each question, ensuring consistency in data collection (Sarstedt et al., 2022). To encourage participation and promote honest responses, potential respondents were informed that the study was purely academic in nature and that their confidentiality and anonymity would be strictly maintained. This systematic process of refinement and validation resulted in the final version of the questionnaire.

4.3. Data Collection

Data gathering was primarily conducted via email and online survey platforms. The research team initially contacted the marketing departments of the sample firms, informing them of the academic nature of the study and assuring them that respondents' privacy and personal information would be kept fully confidential. After obtaining consent, data collection commenced with one marketing staff member representing each sample firm. The data collection period lasted one month. During this time, the researcher sent questionnaires to respondents via platform links and issued multiple reminders to complete the survey by the deadline. Ultimately, the researcher received 78 completed surveys, resulting in a response rate of 78%. All respondents held positions as senior, mid-level, or junior marketing managers within Chinese companies. Following a thorough review, all 78 questionnaires met the research criteria and were prepared for further analysis. Table 1 displays the demographic information of the respondents.

4.4. Data Analysis

To test the research hypotheses and validate the conceptual framework, this study adopts an exploratory research design. The partial least squares structural equation modeling (PLS-SEM) technique is employed as the primary analytical tool. PLS-SEM has been widely recognized for its effectiveness in exploratory studies, particularly when

the research aims to predict key target constructs or test newly developed theoretical models. For data analysis, this study utilizes SmartPLS 4, a widely accepted software for PLS-SEM applications. Data collection was conducted using a five-point Likert scale to capture respondents' perceptions, and the collected data were subsequently processed and analyzed using the PLS-SEM software. This approach ensures a robust evaluation of the measurement and structural models, enabling a comprehensive assessment of the hypothesized relationships.

5. RESULTS AND FINDINGS

Seventy-eight responses were obtained from one hundred questionnaires distributed, resulting in a response rate of 78%. All seventy-eight questionnaires were usable, leading to a usability rating of 100%.

Table 1. Respondents' demographic profile

Profile of respondents (SMEs)			
Type of industry			
	Manufacturing	19	24.35
	Service	54	69.23
	Agriculture	5	6.41
Company location	Eastern region	54	69.23
	Central region	21	26.92
	Western region	2	2.56
Profile of respondents (SMEs)			
	Northeastern region	1	1.28
Total employees	< 20 people	16	20.51
	21–300 people	37	47.44
	301–1000 people	9	11.54
	>1001 people	16	20.51
Operating revenue	< 3 million	11	14.1
	301–2000 million	16	20.51
	2001–4000 million	10	12.82
	4000 million	41	52.56

5.1. Descriptive Statistics

The descriptive statistics for this study were analyzed using SmartPLS 4.0. The variables related to intellectual capital including human, structural, relational, informational, and social capital exhibited standardized distributions with means close to zero and standard deviations of approximately one (Mean ≈ 0.000, SD = 1.000), indicating appropriate normalization for multivariate analysis. For the categorical GDP variable (range: 1.000–4.000), the classification was as follows: scores from 1.000 to 1.999 were considered low (corresponding to the median value of 1.000), 2.000 to 2.999 as medium, and 3.000 to 4.000 as high, reflecting a right-skewed distribution (skewness = 1.846). Complete descriptive statistics for all study variables are presented in Table 2.

Table 2. Descriptive Statistics

Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	Excess Kurtosis
Human capital	78	-0.000	0.098	-1.878	1.986	1.000	0.356	-0.361
Structural capital	78	0.000	0.052	-2.589	1.830	1.000	-0.067	0.036
Relational capital	78	-0.000	-0.042	-3.855	1.710	1.000	-0.745	2.018
Informational capital	78	0.000	-0.010	-3.492	1.562	1.000	-0.468	1.104
Social capital	78	-0.000	0.025	-2.447	1.756	1.000	0.052	-0.350
GDP	78	1.359	1.000	1.000	4.000	0.599	1.846	4.083

Note: Std. Dev. = Standard deviation. N = Sample size.

The data for intellectual capital variables (human, structural, relational, informational, and social capital) were normalized (mean ≈ 0, SD = 1) to match the requirements for regression and SEM. GDP, on the other hand, was

kept at its original scale (mean = 1.359, SD = 0.599) as an ordinal variable. Skewness and kurtosis values were usually acceptable (skewness < |1|, kurtosis < |2|), with modest departures in relational capital (kurtosis = 2.018) and GDP (skewness = 1.846), but they did not violate robust statistical assumptions (Kline, 2015). There were no extreme outliers (all values within ±4 SD), making the data suitable for sophisticated modeling.

5.2. Reliability and Convergent Validity

Reliability and convergent validity assess the consistency and accuracy of a measurement model. Reliability provides internal consistency, while convergent validity demonstrates that related constructs correlate well, as evidenced by high factor loadings, composite reliability (CR), and average variance extracted. Table 3 presents the reliability and convergent validity of the constructs. Table 4 displays the Heterotrait-Monotrait (HTMT) ratios for discriminant validity.

Table 3. Reliability and Convergent Validity

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Human capital	0.904	0.909	0.918	0.445
Structural capital	0.959	0.962	0.962	0.459
Relational capital	0.888	0.901	0.908	0.462
Informational capital	0.928	0.929	0.949	0.822
Social capital	0.936	0.937	0.945	0.634
Marketing performance	0.947	0.948	0.953	0.594

Table 4. HTMT for discriminant validity.

Constructs	HC	INC	RC	SC	SOC	GDP	MP
Human capital	—						
Informational capital	0.465	—					
Relational capital	0.776	0.494	—				
Structural capital	0.674	0.477	0.691	—			
Social capital	0.493	0.649	0.560	0.550	—		
GDP	0.199	0.046	0.142	0.160	0.070	—	
Marketing performance	0.534	0.748	0.610	0.683	0.714	0.076	—

Reliability analysis revealed excellent internal consistency, with Cronbach's alpha values ranging from 0.888 (relational capital) to 0.959 (structural capital), all exceeding the recommended threshold of 0.7 (Nunnally, 1978). Composite reliability indices (rho_a and rho_c) were consistently high (0.901-0.962), further confirming scale reliability. Convergent validity was established through average variance extracted (AVE) values. While most constructs exceeded the 0.5 benchmark (social capital=0.634; marketing performance=0.594; informational capital=0.822), human capital (0.445), structural capital (0.459), and relational capital (0.462) showed marginally lower AVE values. However, given their strong composite reliability (>0.9), these constructs still demonstrate adequate convergent validity (Fornell & Larcker, 1981). Discriminant validity was assessed using HTMT ratios (Table 4). All values fell below the conservative threshold of 0.85 (Henseler, Ringle, & Sarstedt, 2015), with the highest observed between structural capital and marketing performance (0.683) and social capital and marketing performance (0.714). Notably, human capital demonstrated particularly strong discriminant validity (HTMT < 0.534 with all other constructs), while GDP showed minimal correlations (HTMT < 0.199), indicating its distinctiveness within the model.

5.3. Hypothesis Testing

The structural model examines the influence of intellectual capital on the marketing performance of Chinese companies and the moderating role of regional GDP.

Table 5. Structural model results.

Hypothesis & Path	Path coefficient	Sample mean	Standard deviation (STDEV)	t-values	P-values	f^2	Decision
H1: Human capital → Marketing performance	-0.083	-0.047	0.136	0.611	0.541	0.008	Not Supported
H2: Structural capital → Marketing performance	0.354	0.347	0.133	2.666	0.008*	0.156	Supported
H3: Relational capital → Marketing performance	0.124	0.109	0.139	0.887	0.375	0.016	Not Supported
H4: Informational capital → Marketing performance	0.409	0.379	0.106	3.847	0.000*	0.288	Supported
H5: Social capital → Marketing performance	0.205	0.238	0.155	1.326	0.185	0.061	Not Supported
H6: GDP × Human capital → Marketing performance	-0.155	-0.114	0.177	0.875	0.381	0.020	Not Supported
H7: GDP × Structural capital → Marketing performance	-0.015	-0.069	0.163	0.095	0.925	0.001	Not Supported
H8: GDP × Relational capital → Marketing performance	0.146	0.134	0.187	0.782	0.434	0.012	Not Supported
H9: GDP × Informational capital → Marketing performance	-0.010	-0.030	0.128	0.078	0.937	0.001	Not Supported
H10: GDP × Social capital → Marketing performance	0.042	0.099	0.177	0.237	0.812	0.002	Not Supported

Note: *$p < 0.05$.

Table 5 presents the results of the structural model analysis, showing the relationships between the five dimensions of intellectual capital and marketing performance, as well as the moderating effect of regional GDP.

The results of this study indicate that structural capital is a key driver of marketing performance ($\beta = 0.354$, $p = 0.008$), thereby supporting Al-Hawajreh (2013)'s theory on the significance of organizational structure and intellectual capital. It is noteworthy that the interaction effects between GDP and each type of capital on marketing performance were not statistically significant, suggesting that the economic environment does not serve as a moderating factor in this context. Furthermore, the moderating effects of human capital, relational capital, and social capital were found to be insignificant, indicating that enterprises should focus on optimizing internal structural resources rather than relying heavily on external environmental factors or short-term social networks.

6. DISCUSSION AND CONCLUSION

This study employs the path analytic method to investigate the mechanism by which the five aspects of intellectual capital (information capital, structural capital, social capital, human capital, and innovation capital) influence marketing performance, as well as the moderating role of regional GDP.

Structural capital has a significant positive impact on marketing performance ($\beta=0.354$, $p=0.008$), supporting Al-Hawajreh (2013) research on the importance of optimizing organizational structure capital for efficient resource allocation in performance. This finding is consistent with the Bontis and Fitz-enz (2002) study, which concluded that structural capital, such as information systems, organizational procedures, and intellectual property rights, is essential for organizations to produce innovation and effective operations. The study by Subramaniam and Youndt (2005) also demonstrated that by increasing organizational effectiveness and resource allocation, structural capital can improve an organization's market performance. Thus, the results of this study provide more evidence for the critical role that structural capital plays in enhancing marketing performance.

The impact of information capital is significant ($\beta=0.409$, $p<0.001$). According to Cui et al. (2014), informational capital positively influences a brand manager's brand management capabilities. Furthermore, Purwanto et al. (2023) research demonstrates that information spreads like a virus and that businesses profit from it while it is being disseminated. Companies' marketing performance can be significantly enhanced through the efficient use and management of information capital. Therefore, the findings of this study confirm the fundamental importance of information capital in marketing performance and support the perspectives found in the existing literature on the subject.

The direct effect of human capital on marketing performance did not reach statistical significance in the present model. This finding aligns with prior research indicating that industry heterogeneity may attenuate human capital's efficacy (Crook et al., 2011), particularly when specialized competencies remain disconnected from tangible marketing outcomes such as brand equity realization or sales growth metrics. Furthermore, the non-significant relationship corroborates (Huselid & Becker, 1996) resource-based paradox, wherein excessive or misaligned human capital investments can generate diminishing returns through suboptimal resource allocation. To enhance analytical robustness, subsequent investigations should expand the sample size to improve statistical power for capturing cross-sector nuances.

The analysis reveals no statistically significant direct relationship between relational capital and marketing performance ($\beta = 0.124$, $p = 0.375$), suggesting that constructs such as customer loyalty, supplier partnerships, and employee networks may exert influence indirectly through mediating mechanisms (Febrian et al., 2020). Customer retention, a fundamental aspect of relational capital, for example, showed no discernible correlation with marketing efficacy in SMEs in Bantul, Indonesia (Farida et al., 2021). On the other hand, although having a positive path coefficient ($\beta=0.205$), social capital failed the significance test ($p=0.185$). This outcome may be related to the limitations of the measuring dimension or the mediation effect. High levels of social capital, such as tight-knit relationships, can negatively impact performance by fostering over-embeddedness, as noted by Uzzi (1997).

Furthermore, there are no substantial moderating effects for human capital, relational capital, social capital, or regional GDP. While Weckroth and Kemppainen (2016) identified correlations between regional GDP and human capital metrics, they found no direct control over marketing outcomes. This pattern is echoed by Sabra (2024), who emphasized human capital's direct effects independent of macroeconomic conditions. Similarly, the efficacy of relational capital appears to be driven by internal investments rather than regional GDP, as demonstrated by Kohtamäki et al. (2012) and Jardón and da Silva (2023), while Griffith and Lusch (2007) corroborate the non-significant moderation across international samples. Thompson and Slaper (2016) prioritized firm-level management over regional GDP dependency for informational capital, whereas Andrews and Wankhade (2015) and Pan and He (2010) found little regional GDP interaction for social capital. Although several studies (e.g., Agostini et al., 2017; Bronisz & Heijman, 2010) have found contextual regional GDP impacts, these were often industry- or region-specific, contradicting the general view that internal tactics outweigh macroeconomic variables. Therefore, the non-significant moderating role of regional GDP in this study aligns with current theoretical and empirical trends.

This study offers a new perspective on the potential influence of social capital, highlights the limitations of regional GDP within the current model, and empirically confirms the critical roles that informational capital and structural capital play in enhancing marketing success. These findings not only contribute to the theory of knowledge capital but also serve as a valuable source of inspiration for businesses' marketing strategies. Future research could explore the mediating role of social capital in greater detail, improve regional GDP measurement techniques, and consider additional moderating factors.

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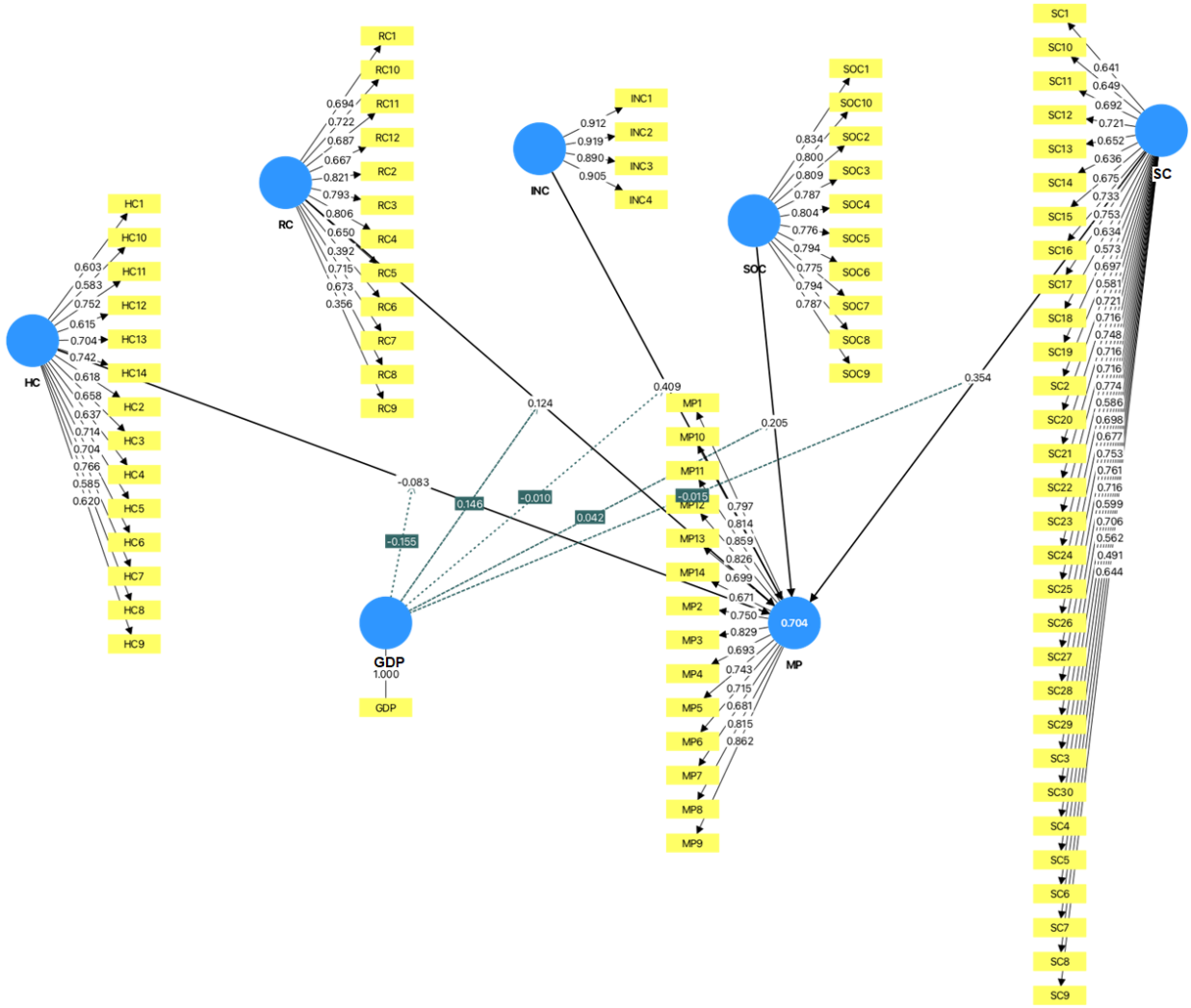

Figure 2. Structural Equation Modeling (SEM) diagram.

Figure 2 shows the Structural Equation Modeling (SEM) diagram of the study.