Intellectual property protection and entrepreneurship among ethnic minority youth in Vietnam's Northern Midlands and Mountains

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A R T I C L E   I N F O

A B S T R A C T

The aim of this research is to examine how intellectual property (IP) protection affects the entrepreneurial activities of ethnic minority youth in Vietnam's Northern midland and mountainous regions, where access to innovation resources and markets is limited. Based on institutional theory, the resource-based view, and intellectual capital theory, the study develops and tests a conceptual model that considers both direct and indirect effects of IP protection. Survey data were collected from 386 youth-led enterprises, cooperatives, and startups, and Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for analysis. The results indicate that IP protection has a significant positive effect on intellectual capital, entrepreneurial motivation, and innovation capability. However, only intellectual capital and innovation capability positively influence startup outcomes, while entrepreneurial motivation shows no significant effect. In addition, the moderating effects of social network cohesion and local policy support are not confirmed, suggesting a limited role of local interventions. Overall, the findings show that IP protection is effective mainly when it is transformed into knowledge-based resources and innovation capacity. The study recommends increasing IP awareness, simplifying IP registration processes, and strengthening capacity-building programs.

1. Introduction

Entrepreneurship has long been regarded as a fundamental driver of economic growth, innovation, and social transformation (Oosterbeek et al., 2010). For ethnic minority youth, entrepreneurial activity represents not only a pathway to income generation and employment but also a mechanism for preserving cultural identity and integrating traditional livelihoods into modern market systems. In Vietnam's Northern Midland and Mountainous Region, where economic development lags behind the national average and institutional voids remain pervasive, promoting entrepreneurship among ethnic minority youth has become both a strategic policy priority and a critical development challenge. Against this backdrop, a fundamental question arises*:* How do institutional mechanisms,

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particularly intellectual property (IP) protection, shape entrepreneurial potential and outcomes in such disadvantaged environments? This issue has received limited empirical attention in existing literature.

Theoretical and empirical research consistently highlights the pivotal role of IP protection in fostering innovation and entrepreneurship. Endogenous growth theory posits that IP rights provide incentives for knowledge creation, diffusion, and commercialization (Autio and Acs, 2010). Meanwhile, institutional theory emphasizes that in contexts characterized by institutional voids, such as transition economies or peripheral regions, formal legal mechanisms interact with informal networks, trust, and cultural practices to influence entrepreneurial behavior (Puffer et al., 2010). For ethnic minority entrepreneurs, whose ventures often rely on traditional knowledge, indigenous resources, and cultural heritage, IP protection functions as both an economic safeguard and a cultural preservation mechanism (Dana and Morris, 2007). Nevertheless, the effectiveness of these formal protections is often undermined by limited awareness, weak enforcement, and barriers to IP registration

(Blakeney and Mengistie, 2011). Consequently, a persistent gap exists between the potential and realized benefits of IP protection, particularly in Vietnam's Northern Midland and Mountainous Region, where educational, financial, and infrastructural constraints constrain innovation.

Beyond its legal function, IP protection plays a transformative role in enhancing intellectual capital (IC)-the combination of human, structural, and relational resources that enable entrepreneurs to generate and exploit knowledge (Autio and Acs, 2010). In disadvantaged regions, IC serves as a key mediating channel through which IP protection contributes to entrepreneurial performance and innovation capability. For ethnic minority youth, IC embodies both modern entrepreneurial knowledge and embedded traditional wisdom, enabling them to translate protected cultural assets into viable market offerings. Moreover, entrepreneurial motivation (EM) and innovation capability (IV) are central behavioral mechanisms that transform institutional support into tangible outcomes (Dana and Morris, 2007; Etzkowitz, 2003). However, as previous research suggests, high motivation alone may not guarantee success under structural constraints such as capital shortages, poor infrastructure, and limited digital connectivity-conditions common in the region. Understanding these mediating and moderating pathways is thus critical to explaining why institutional interventions, including IP policies, often produce uneven outcomes.

Accordingly, this study examines the impact of IP protection on the entrepreneurial activities of ethnic minority youth in Vietnam's Northern Midland and Mountainous Region. Integrating insights from endogenous growth theory, institutional theory, and ethnic minority entrepreneurship literature, we develop and empirically test a conceptual model that captures both the direct and indirect effects of IP protection. Specifically, we investigate how IP protection influences startup outcomes through the mediating roles of intellectual capital, entrepreneurial motivation, and innovation capability, while also evaluating the moderating effects of social network cohesion and local policy support. By focusing on this unique demographic and geographic context, the study contributes to filling a major gap in the entrepreneurship and IP literature, revealing how institutional mechanisms interact with social and cognitive resources to shape entrepreneurial success in under-researched, institutionally fragile environments.

2. Literature review and theoretical foundation

The protection of intellectual property rights (IPR) has long been acknowledged as a critical institutional catalyst for innovation, economic growth, and entrepreneurial activity. Thompson and Rushing (1999) argued that IPR not only incentivizes technological advancement but also facilitates the diffusion of knowledge across the economy. Subsequent research reinforces this role, showing that patents and related IP mechanisms enable startups to mitigate imitation risks, attract venture capital investment, and signal technological legitimacy to external stakeholders.

In transitional and developing economies, the role of IPR extends beyond innovation incentives. It serves as a trust-building mechanism, enhancing market credibility and facilitating participation in "markets for ideas." Gans and Stern (2003) emphasized that such markets allow new ventures to strategically choose between competition and collaboration with established firms, leveraging formal IP protection to negotiate knowledge-sharing and technology transfer agreements. However, the practical value of IP in these settings often depends on the strength of supporting institutions and the capacity of entrepreneurs to convert legal rights into competitive advantage- a dimension that remains underexplored in emerging contexts such as Vietnam's Northern Highlands.

Intellectual capital (IC), comprising human, structural, and relational dimensions have been widely recognized as a core mediating asset that translates institutional mechanisms into tangible entrepreneurial performance (Bontis, 1998). Later research extends this view by emphasizing IC as the foundation of sustainable competitive advantage in knowledge-based economies (Kaufmann and Schneider, 2004). Etzkowitz (2003) conceptualized the "entrepreneurial university" as a generator of IC, where research groups function as quasi-firms, creating and disseminating knowledge at multiple societal levels.

For ethnic minority youth entrepreneurs, IC is shaped not only by formal education and technical know-how but also by traditional knowledge systems, cultural identity, and community-based relationships. These forms of capital enable entrepreneurs to transform indigenous resources into commercialized innovations, particularly in sectors linked to agriculture, OCOP (One Commune One Product) initiatives, and geographical indication-based branding (Campi and Nuvolari, 2021). Within such contexts, IP protection acts as a complementary institutional force that helps codify and commercialize these intangible assets, turning cultural capital into marketable intellectual capital.

Entrepreneurial motivation (EM) functions as a psychological and behavioral conduit that transforms ideas into entrepreneurial action. However, its effects vary across institutional and cultural settings. Oosterbeek et al. (2010) found that entrepreneurship education in Europe yielded limited or even negative impacts on motivation, reflecting contextual dependencies. By contrast, Autio and Acs (2010) demonstrated that EM is strongly shaped by institutional quality, social capital, and perceived market opportunities, factors that are especially salient in transitional economies.

Among ethnic minority youth, EM often arises from necessity-based entrepreneurship rather than opportunity-driven motives. It reflects aspirations to escape poverty, improve livelihoods, and preserve

cultural identity (Dana and Morris, 2007; Ramadani et al., 2014). Yet, while motivation is an important driver, it may not always translate into successful outcomes due to structural constraints such as a lack of capital, inadequate infrastructure, and limited access to innovation ecosystems. This highlights the need to understand EM not as an isolated variable but as part of a broader institutional-resource framework that interacts with IP protection, intellectual capital, and innovation capability.

The literature on ethnic entrepreneurship underscores the substitutive role of social capital in environments characterized by weak formal institutions (Dana and Morris, 2007; Ramadani et al., 2014). Puffer et al. (2010) showed that in Russia and China, where institutional voids persisted, relational networks such as guanxi and blat provided essential support for entrepreneurial survival and growth. These informal systems compensated for deficient market mechanisms by enabling access to resources, legitimacy, and information.

In Vietnam's Northern Midland and Mountainous Region, social networks similarly facilitate access to finance, labor, and materials, while maintaining trust and reputation for products tied to geographical indications or collective trademarks. However, recent evidence suggests that these networks often deliver strong social cohesion but weak market leverage, providing emotional and cultural support but limited capacity for commercialization or innovation diffusion. This may explain why social networks sometimes fail to moderate the relationship between institutional mechanisms (such as IP protection) and entrepreneurial outcomes in resource-constrained regions.

Although the existing literature provides valuable insights into the nexus between intellectual property (IP) protection, innovation, and entrepreneurship, several critical gaps persist. First, prior studies have consistently emphasized that IP protection acts as a fundamental institutional mechanism that legitimizes and safeguards intellectual assets, thereby stimulating innovation and entrepreneurial activity (Hall et al., 2014; Autio and Acs, 2010; North, 1990). However, the majority of this evidence stems from developed economies with well-established legal and innovation ecosystems, leaving the dynamics of IP protection in emerging and transitional contexts largely underexplored. Second, intellectual capital (IC) and social capital (SC) have been widely recognized as pivotal mediating mechanisms through which IP protection enhances firm-level innovation and performance (Puffer et al., 2010). Yet, the interaction between these intangible assets remains theoretically fragmented, particularly in institutionally weak environments where formal and informal institutions coexist (Ramadani et al., 2014). Third, entrepreneurial motivation and policy interventions are often conceptualized as potential moderators in the IP-innovation- performance relationship. Nonetheless, empirical results remain inconclusive and context-dependent (Krueger et al., 2000; Ren et al., 2017), suggesting the need for context-sensitive frameworks that account for behavioral, institutional, and resource-based contingencies.

Most critically, the entrepreneurial behavior of ethnic minority youth in developing economies remains underrepresented in scholarly discourse. Little is known about how institutional structures (e.g., IP regimes) interact with psychological factors (e.g., motivation) and social dynamics (e.g., network cohesion and policy support) to shape entrepreneurial success in resource-constrained and culturally diverse ecosystems (Dana and Morris, 2007; Wiklund and Shepherd, 2003).

In summary, while existing studies confirm the foundational role of IP protection and the mediating influence of intellectual capital, empirical understanding remains limited regarding how these mechanisms function within institutionally weak, socially embedded, and economically peripheral regions. Addressing this research gap requires an integrated theoretical framework that synthesizes institutional theory, the resource-based view (RBV), and social capital theory. Such a model should explicitly account for the roles of entrepreneurial motivation, innovation capability, and contextual moderators such as social networks and local policy support. The next section elaborates on this theoretical foundation and develops the proposed conceptual model and hypotheses for empirical validation.

Institutional theory posits that formal rules, legal frameworks, and social norms fundamentally shape the behaviors and strategic choices of individuals and organizations (North, 1990). Within the entrepreneurial domain, institutions-especially those governing intellectual property (IP) protection-serve as essential mechanisms that transform innovative ideas into viable ventures and facilitate the mobilization of critical resources (Autio and Acs, 2010). In weak institutional environments, however, these mechanisms often fail to function effectively. Puffer et al. (2010) demonstrated that in contexts such as Russia and China, where formal institutions were underdeveloped, informal systems-including trust-based relationships and social networks-emerged as substitute institutions supporting entrepreneurial activity.

In the Vietnamese context, particularly in ethnic minority and mountainous regions, IP protection performs a dual institutional function: It enhances entrepreneurs' confidence to commercialize innovations while legitimizing products derived from traditional knowledge and cultural heritage. Thus, IP protection operates not only as a legal safeguard but also as a signal of institutional credibility, fostering trust between entrepreneurs, investors, and consumers in an economy still characterized by institutional voids.

The resource-based view (RBV) provides a complementary perspective by explaining how firms achieve sustainable competitive advantage through the acquisition and effective utilization of resources that are valuable, rare, inimitable, and non-

substitutable (VRIN) (Barney, 1991). In this framework, intellectual property constitutes a critical intangible resource that embodies VRIN characteristics by securing exclusive ownership of ideas, technologies, and creative outputs.

Empirical studies show that IP ownership enhances startups' ability to attract financing, access partnerships, and sustain competitive advantage. For ethnic minority youth entrepreneurs, IP protection represents both a strategic asset and a capability-building mechanism. It enables the transformation of indigenous knowledge and traditional products into market-differentiated goods, thereby linking local innovation with broader market competitiveness. RBV thus provides the theoretical basis for conceptualizing IP as a strategic input that fuels intellectual capital accumulation and innovation capability.

Intellectual Capital (IC) Theory emphasizes that human, structural, and relational capital collectively form the foundation of organizational knowledge and innovation (Bontis, 1998; Nahapiet and Ghoshal, 1998). IC not only drives firm performance but also mediates the relationship between institutional mechanisms and entrepreneurial outcomes (Hall et al., 2014). In developing or peripheral regions, the accumulation of IC is particularly dependent on the presence of supportive institutional conditions-such as IP protection-that encourage knowledge creation, sharing, and commercialization.

In the case of ethnic minority entrepreneurship, IC encompasses both formal competencies (skills, management knowledge) and informal assets (indigenous experience, community-based relationships). These dimensions enable entrepreneurs to convert traditional cultural practices into codified intellectual resources protected by IP regimes. Hence, IC functions as a bridge between institutional structures (IP systems) and individual entrepreneurial performance, aligning with both institutional and RBV perspectives.

Social network theory complements these frameworks by recognizing that economic activities are embedded within social structures (Granovetter, 1985). Networks facilitate information flow, trust-building, and access to capital, serving as informal institutions that compensate for formal institutional deficiencies (Ramadani et al., 2014). In contexts with weak infrastructure and limited access to external markets, such as the Northern Midland and Mountainous Region of Vietnam, social cohesion and relational embeddedness play a critical role in entrepreneurial survival.

However, network effects are context-contingent. While cohesive networks may enhance collaboration and knowledge exchange, excessive reliance on closed community ties can limit exposure to external opportunities and market-based innovation. Accordingly, in this study, social network cohesion is conceptualized as a moderating variable that can either amplify or constrain the relationship between IP protection and intellectual capital development,

depending on whether networks provide economic leverage or merely social support.

Drawing upon these four complementary theoretical perspectives, the conceptual framework of this study rests on the following foundations. Institutional theory explains how IP protection functions as a formal institutional mechanism that enhances legitimacy, reduces uncertainty, and promotes entrepreneurial confidence. Resource-based view (RBV) highlights IP and intellectual capital as strategic intangible resources that provide sustainable competitive advantages when effectively leveraged. Intellectual capital theory elucidates the mediating pathways through which IC and innovation capability transmit the effects of IP protection to entrepreneurial outcomes. Social network theory provides insight into how social cohesion and local policy support act as contextual moderators, strengthening or weakening the influence of IP protection depending on institutional and social configurations.

By integrating these perspectives, the proposed research model situates IP protection at the intersection of institutional support and resource utilization, illustrating how formal rules, intangible assets, and social structures interact to shape the entrepreneurial success of ethnic minority youth in emerging economies.

3. Conceptual framework and hypotheses

Grounded in Institutional Theory, the Resource-Based View (RBV), Intellectual Capital Theory, and Social Network Theory, this study advances an integrative conceptual framework explaining how intellectual property (IP) protection shapes entrepreneurial outcomes among ethnic minority youth in Vietnam's Northern Midland and Mountainous Region.

The framework conceptualizes IP protection as a core institutional mechanism that enhances legitimacy, reduces market uncertainty, and creates incentives for knowledge creation and commercialization. From an economic standpoint, IP protection functions as both a public institutional good and a private strategic asset, facilitating resource mobilization, investment confidence, and innovation efficiency.

Internally, the effects of IP protection are transmitted through three key mechanisms: Intellectual Capital (IC), representing accumulated knowledge and relational resources; Entrepreneurial Motivation (EM), reflecting the psychological drivers of opportunity recognition and action; and Innovation Capability (IV), denoting the firm's dynamic ability to convert knowledge into marketable outputs. These mediating constructs capture the behavioral and cognitive channels through which institutional advantages translate into entrepreneurial performance.

Externally, the framework recognizes that contextual conditions, particularly Social Network Cohesion (SN) and Local Policy Support (LP),

moderate the strength of these relationships. Strong, market-oriented networks and coherent policy environments are expected to amplify the benefits of IP protection by improving resource access and information flow, while closed or fragmented systems may constrain these effects.

Overall, this conceptual framework positions IP protection as a catalytic institutional asset operating through both internal capability development and external contextual reinforcement. It provides a multi-level economic explanation of how institutional quality, knowledge resources, and social embeddedness interact to determine entrepreneurial performance in developing and institutionally weak regions.

3.1. Hypotheses development

According to Intellectual Capital Theory, intellectual capital-comprising human, structural, and relational resources-constitutes a pivotal intangible asset that determines entrepreneurial performance (Bontis, 1998). Entrepreneurs and firms possessing a richer base of IC are better equipped to integrate knowledge, stimulate innovation, and adapt to dynamic markets. Empirical studies have consistently shown that IC enhances innovation capability, which ultimately contributes to superior startup outcomes in terms of growth, competitiveness, and sustainability. In the context of ethnic minority youth entrepreneurs, IC derived from both formal education and traditional knowledge represents a critical mechanism for overcoming institutional constraints and achieving business success.

H1: Intellectual Capital (IC) positively influences Startup Outcomes (SU).
H2: Intellectual Property Protection (IP) positively influences Intellectual Capital (IC).

From the Resource-Based View (RBV), intellectual property constitutes a valuable, rare, inimitable, and non-substitutable (VRIN) resource (Barney, 1991). Effective IP protection provides institutional assurance that motivates entrepreneurs to invest in knowledge creation and codification, thereby reinforcing intellectual capital development (Hall et al., 2014). In developing economies, formal IP frameworks also enhance legitimacy by enabling entrepreneurs to formalize indigenous knowledge and transform cultural resources into codified intellectual assets. Therefore, IP protection functions both as an institutional safeguard and as a catalyst for IC accumulation.

H3: Intellectual Property Protection (IP) positively influences Entrepreneurial Motivation (EM).

According to Institutional Theory, a stable and reliable legal framework strengthens confidence among entrepreneurs by reducing uncertainty and perceived risks (North, 1990; Autio and Acs, 2010).

When intellectual assets are effectively protected, individuals are more willing to commercialize innovations and invest in entrepreneurial activities (Shane, 2000; Meghwal et al., 2023). For ethnic minority youth, IP protection validates creative outputs and fosters a sense of ownership and self-efficacy, thereby enhancing entrepreneurial motivation. Nevertheless, existing literature suggests that motivation alone may not guarantee entrepreneurial success when structural barriers such as financial constraints, inadequate infrastructure, or limited market access persist.

H4: Intellectual Property Protection (IP) indirectly influences Startup Outcomes (SU) through Innovation Capability (IV).

IP protection stimulates investment in research and development (R&D), technological upgrading, and process improvement. These mechanisms contribute to building innovation capability-the ability to transform protected ideas into competitive offerings (Hurmelinna-Laukkanen and Puumalainen, 2007). Innovation capability thus acts as a dynamic channel through which IP protection indirectly enhances entrepreneurial performance. This perspective highlights the functional role of IP as a dynamic capability that enables ongoing innovation rather than a static legal safeguard.

H5: Social Network Cohesion (SN) positively moderates the relationship between IP and IC.

Social Network Theory emphasizes that entrepreneurial activities are embedded within relational structures that facilitate trust, information exchange, and resource access (Granovetter, 1985). In resource-constrained environments, cohesive networks can enhance the translation of institutional resources, such as IP protection, into intellectual capital by supporting collective learning and knowledge diffusion. However, the direction and magnitude of this moderating effect may vary: networks providing market-oriented support are likely to amplify the IP–IC link, whereas networks dominated by social or emotional ties may constrain commercialization potential.

H6: Local Policy Support (LP) positively moderates the relationship between IP and IV.

Consistent with Institutional Theory, effective policy interventions can strengthen the practical impact of IP protection by aligning local governance, funding mechanisms, and innovation incentives (North, 1990). Within OCOP programs and regional innovation systems, supportive local policies can improve entrepreneurs' access to training, technology, and IP registration assistance. Such policies are expected to reinforce the positive relationship between IP protection and innovation capability. Conversely, fragmented or weakly

implemented policies may reduce the institutional effectiveness of IP frameworks.

H7: Entrepreneurial Motivation (EM) positively influences Startup Outcomes (SU).

Entrepreneurial motivation represents a fundamental psychological driver that transforms opportunity recognition into entrepreneurial action (Krueger et al., 2000). Highly motivated entrepreneurs demonstrate greater persistence and resilience, enabling them to overcome environmental and institutional obstacles. Nevertheless, research in developing contexts suggests that the strength of this relationship depends on the availability of enabling conditions such as capital, infrastructure, and institutional support, implying potential variability across contexts.

H8: Innovation Capability (IV) positively influences Startup Outcomes (SU).

Innovation capability-the capacity to generate and implement new ideas, products, and processes-constitutes a primary determinant of competitive advantage and long-term sustainability (Zahra and Covin, 1993). For ethnic minority youth entrepreneurs, IV represents the tangible outcome of accumulated intellectual capital and institutional learning. Stronger innovation capabilities are thus expected to yield improved startup outcomes through enhanced adaptability, market responsiveness, and value creation.

4. Methodology

This study employs a quantitative research design using survey data collected from youth-led enterprises, cooperatives, and startups established by ethnic minority entrepreneurs across Vietnam's Northern Midland and Mountainous Region. A stratified sampling approach was adopted based on province, ethnicity, and organizational type to ensure balanced representation across geographical and socio-economic strata. Within each stratum, controlled convenience sampling was then applied to capture diversity in firm size, gender, and sectoral distribution.

Data collection was conducted between May and August 2024 through a mixed-mode strategy, combining in-person interviews (for remote communes) and online questionnaires (via Google Forms). This hybrid approach helped maximize accessibility and data completeness. Substantial logistical support was provided by provincial Youth Unions, Cooperative Alliances, and Departments of Science and Technology, ensuring the authenticity and relevance of the sample.

A total of 386 valid responses were retained for analysis, exceeding the minimum requirement for Partial Least Squares Structural Equation Modeling (PLS-SEM) as recommended by Hair et al. (2019),

and ensuring adequate statistical power for bootstrapping procedures. Prior to the main survey, a pilot study with 50 respondents was conducted to refine wording, assess internal consistency (Cronbach's alpha > 0.70), and validate the clarity of translated items. No major changes were required, confirming the robustness of the questionnaire design.

All constructs in this study were operationalized using multi-item reflective scales adapted from well-established sources and carefully contextualized to the entrepreneurial environment of ethnic minority youth. Each item was measured on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The final questionnaire consisted of seven latent constructs as follows.

Intellectual property protection (IP): This construct was measured using four items adapted from Hall et al. (2014), Shane (2000), and Gans and Stern (2003). The indicators capture the extent to which intellectual property rights safeguard entrepreneurial ideas, strengthen legitimacy, and support commercialization activities. One item also reflects the protection of indigenous knowledge and cultural expressions—an essential dimension of entrepreneurship among ethnic minority groups.

Intellectual capital (IC): Three items were adapted from Bontis (1998) and Nahapiet and Ghoshal (1998) to assess the key components of human, structural, and relational capital. These indicators represent the entrepreneurs' accumulated skills, organizational systems, and external relationships that transform institutional support into measurable performance outcomes.

Entrepreneurial motivation (EM): Six items, drawn from Krueger et al. (2000), Autio and Acs (2010), and Meghwal et al. (2023), were employed to measure both intrinsic and extrinsic drivers of entrepreneurship. The items capture aspirations related to improving livelihoods, demonstrating self-efficacy, and pursuing perceived business opportunities.

Innovation capability (IV): This construct was measured by three items reflecting a firm's ability to generate, adopt, and commercialize innovations. The scale was adapted from Hurmelinna-Laukkanen and Puumalainen (2007) and Meghwal et al. (2023), emphasizing innovation as a dynamic capability linking IP protection and entrepreneurial performance.

Startup outcomes (SU): Six items, adapted from Zahra and Covin (1993) and Wiklund and Shepherd (2003), were used to assess multiple dimensions of startup success, including financial performance, market growth, customer acceptance, and community impact. The inclusion of a social dimension recognizes the dual economic and cultural objectives of ethnic minority ventures.

Social network cohesion (SN): Five items were developed based on Granovetter (1985) and Ramadani et al. (2014) to evaluate the degree of trust, family support, and community relationships that facilitate resource mobilization and information

sharing within local entrepreneurial ecosystems. Local policy support (LP): Three items, adapted from North (1990) and Dana and Morris (2007), capture the perceived effectiveness, accessibility, and scope of local government programs supporting entrepreneurship, including training, funding, and preferential credit schemes. Table 1 summarizes the constructs, number of items, example indicators, and key references used to operationalize the measurement scales in this study.

Table 1: Summary of measurement scales

Construct	Number of items	Example indicators (short)	References
Intellectual property protection (IP)	4	Safeguard products/ideas; Encourage R&D investment	Hall et al. (2014), Shane (2000), and Gans and Stern (2003)
Intellectual capital (IC)	3	Skilled employees; Internal systems; Customer relationships	Bontis (1998) and Nahapiet and Ghoshal (1998)
Entrepreneurial motivation (EM)	6	Improve income; Express capabilities; Leverage market opportunities	Krueger et al. (2000), Autio and Acs (2010), and Meghwal et al. (2023)
Innovation capability (IV)	3	Develop new products; Adopt new processes; Commercialize ideas	Hurmelinna-Laukkanen and Puumalainen (2007) and Meghwal et al. (2023)
Startup outcomes (SU)	6	Revenue growth; Customer acceptance; Community impact	Zahra and Covin (1993) and Wiklund and Shepherd (2003)
Social network cohesion (SN)	5	Support from family/friends; Access to customers; Mobilize resources	Granovetter (1985) and Ramadani et al. (2014)
Local policy support (LP)	3	Policy encouragement; Government training; Access to preferential credit	North (1990) and Dana and Morris (2007)

These scales are well-suited to the Vietnamese ethnic minority entrepreneurial context, as they capture both institutional dimensions (IP, LP) and resource-based dimensions (IC, IV), while also incorporating socio-cultural dynamics (EM, SN) central to community-based entrepreneurship. Together, they form a comprehensive measurement system linking institutional mechanisms, knowledge resources, and entrepreneurial outcomes, offering both theoretical coherence and contextual validity.

5. Results

Table 2 presents the demographic and organizational profile of the 386 valid respondents representing youth-led enterprises, cooperatives, and startups founded by ethnic minority entrepreneurs across Vietnam's Northern Midland and Mountainous Region. The sample composition reveals that male respondents constitute a dominant proportion (77.98%), highlighting a persistent gender gap in entrepreneurial participation among ethnic minority youth. This imbalance aligns with prior research noting limited female representation in entrepreneurship within rural and mountainous contexts of Vietnam.

Regarding education, nearly half of the respondents (47.93%) had vocational or college-level training, followed by 21.50% with upper secondary education. Only 13.99% attained university or postgraduate qualifications. This suggests a relatively modest educational foundation, potentially constraining access to knowledge-intensive entrepreneurial skills and innovation-driven opportunities.

In terms of startup capital, over 62% of respondents began with less than USD 20,000, while only 0.78% launched ventures exceeding USD 200,000. Such financial limitations underscore structural barriers to scaling and innovation. Collectively, these descriptive patterns provide crucial empirical context for interpreting the subsequent measurement and structural model analyses, where institutional mechanisms (e.g., IP protection) and resource-based factors (e.g., IC, IV) are hypothesized to compensate for these constraints.

Table 2: Profile of the respondents

Characteristic		Frequency (N)	Percent (%)
Gender	Male	301	77.98
	Female	85	22.02
Educational level	Primary school	20	5.18
	Lower secondary school	44	11.40
	Upper secondary school	83	21.50
	Vocational/college	185	47.93
	University, postgraduate	54	13.99
Startup capital	< 4,000 USD	118	30.57
	4,000 – 20,000 USD	122	31.61
	20,000 – < 40,000 USD	74	19.17
	40,000 – 200,000 USD	69	17.88
	> 200,000 USD	3	0.78

The measurement model was evaluated following the guidelines of Hair et al. (2019), covering four criteria: indicator reliability, internal consistency, convergent validity, and discriminant validity. Indicator reliability: The outer loadings of most indicators exceeded the recommended threshold of 0.70, indicating satisfactory indicator reliability. For Intellectual Property Protection (IP), loadings ranged from 0.658 to 0.869, with IP4 (0.658) retained for theoretical reasons. Intellectual Capital (IC) exhibited loadings between 0.761 and 0.913, Entrepreneurial Motivation (EM) ranged from 0.791 to 0.874, and Innovation Capability (IV) from 0.884 to 0.925. Startup Outcomes (SU) indicators ranged

from 0.649 to 0.900, while Social Network Cohesion (SN) and Local Policy Support (LP) showed adequate reliability with loadings from 0.650 to 0.896 and 0.868 to 0.925, respectively. Internal consistency reliability: All constructs exhibited strong reliability, with Cronbach's alpha (α) values above 0.70 and Composite Reliability (CR) values exceeding 0.80, confirming internal consistency across all constructs.

Convergent validity: The Average Variance Extracted (AVE) for all constructs surpassed 0.50, suggesting that each latent variable explains more

than half of the variance in its corresponding indicators.

Discriminant validity: Discriminant validity was verified through the Fornell–Larcker criterion (Fornell and Larcker, 1981) and the Heterotrait–Monotrait ratio (HTMT) (Henseler et al., 2016). The square roots of AVE (0.75–0.86) exceeded the inter-construct correlations, and all HTMT values were below 0.85, establishing the distinctiveness of all constructs. The detailed results of the measurement model assessment are presented in Table 3.

Table 3: Measurement model results

Construct	Indicators (loadings)	Cronbach's alpha	CR	AVE
Intellectual property protection (IP)	IP1 (0.837), IP2 (0.869), IP3 (0.735), IP4 (0.658)	0.82	0.87	0.57
Intellectual capital (IC)	IC1 (0.833), IC2 (0.913), IC3 (0.761)	0.84	0.89	0.66
Entrepreneurial motivation (EM)	EM1 (0.827) – EM6 (0.791–0.874)	0.87	0.91	0.63
Innovation capability (IV)	IV1 (0.884), IV2 (0.925), IV3 (0.892)	0.88	0.92	0.74
Startup outcomes (SU)	SU1 (0.649) – SU6 (0.900)	0.89	0.93	0.68
Social network cohesion (SN)	SN1 (0.810) – SN5 (0.650)	0.83	0.88	0.59
Local policy support (LP)	LP1 (0.900), LP2 (0.925), LP3 (0.868)	0.85	0.91	0.72

Retention of low-loading indicators: Despite falling slightly below the conventional 0.70 threshold, the indicators IP4 (0.658) and SU1 (0.649) were retained based on strong theoretical and contextual justification, consistent with the methodological recommendations of Hair et al. (2019). According to these authors, indicators with loadings above 0.60 may be preserved when they capture conceptually indispensable aspects of a construct, provided that the overall reliability (α > 0.80; CR > 0.85) remains robust.

IP4 ("Intellectual property helps protect indigenous knowledge and traditional cultural expressions") represents a distinct institutional dimension of entrepreneurship among ethnic minority groups. In these contexts, business ventures frequently rely on community-based intellectual assets-including traditional know-how, local designs, and cultural heritage-rather than formal patents or technologies. Removing this indicator would omit a critical institutional feature of how IP protection functions as a safeguard for collective and cultural knowledge in developing, culturally embedded economies.

SU1 ("My startup contributes to preserving local culture and identity") embodies the socio-cultural dimension of entrepreneurial success, emphasizing non-financial and community-centered outcomes that are often overlooked in mainstream entrepreneurship research. In ethnic-minority regions, preserving culture and identity through enterprise activity is a key indicator of social value creation. Retaining SU1 ensures that the Startup Outcomes (SU) construct encompasses both economic performance and cultural contribution, reflecting the dual mission of ethnic-minority entrepreneurs.

Thus, the inclusion of IP4 and SU1 strengthens the conceptual validity of the measurement model by ensuring that it reflects both economic and socio-cultural dimensions of entrepreneurship. This approach recognizes that entrepreneurial success in

developing regions is multidimensional, anchored in institutional legitimacy, cultural sustainability, and social impact, alongside financial performance.

5.1. Structural model

The structural model was evaluated using path coefficients, coefficient of determination (R^2), predictive relevance (Q^2), and effect sizes (f^2), in accordance with the procedures recommended by Hair et al. (2019). A bootstrapping procedure with 5,000 resamples was performed to assess the significance and robustness of all hypothesized relationships.

Path coefficients: As presented in Table 4, the results provide strong empirical support for most hypothesized relationships. Intellectual Property Protection (IP) exerts significant positive effects on Intellectual Capital (IC) ($\beta = 0.331$, $p < 0.001$), Entrepreneurial Motivation (EM) ($\beta = 0.632$, $p < 0.001$), and Innovation Capability (IV) ($\beta = 0.432$, $p < 0.001$). These findings affirm the pivotal role of IP protection as both an institutional enabler (as suggested by North (1990)) and a strategic resource within the RBV framework (Barney, 1991).

Furthermore, Startup Outcomes (SU) are significantly influenced by IC ($\beta = 0.352$, $p < 0.001$) and IV ($\beta = 0.532$, $p < 0.001$), reinforcing Intellectual Capital Theory (Bontis, 1998) in demonstrating that knowledge-based and innovation capabilities serve as primary pathways linking institutional mechanisms to entrepreneurial performance.

However, the path from Entrepreneurial Motivation (EM) to Startup Outcomes (SU) was not statistically significant ($\beta = 0.038$, n.s.). This result is theoretically meaningful: While motivation is necessary, it is insufficient to produce tangible outcomes in structurally constrained environments. This aligns with behavioral research emphasizing that motivation without enabling resources or institutional support rarely translates into entrepreneurial success (Autio and Acs, 2010).

Coefficient of determination (R^2): The model exhibits substantial explanatory power, with R^2 values of 0.496 (IC), 0.398 (EM), 0.614 (IV), and 0.686 (SU). These results indicate that approximately 69% of the variance in startup outcomes is explained by the model's predictors, confirming its strong explanatory capability and theoretical robustness in capturing the mechanisms through which institutional and resource-based factors jointly influence entrepreneurial success.

Predictive relevance (Q^2): All Q^2 values were greater than zero, confirming that the model possesses predictive relevance and can effectively forecast the endogenous constructs. This supports the reliability of the proposed conceptual framework in explaining entrepreneurial dynamics within the unique context of ethnic minority regions.

Effect sizes (f^2): Effect size analysis revealed that IP had moderate effects on IC ($f^2 \approx 0.15$–0.30) and IV ($f^2 \approx 0.20$), while IC ($f^2 \approx 0.18$) and IV ($f^2 \approx 0.29$) exerted substantial effects on SU. The contribution of EM was minor ($f^2 < 0.02$), consistent with its non-significance in the structural model. These findings highlight that knowledge accumulation and innovation capability-not motivation alone-serve as the key mediating resources translating institutional mechanisms into entrepreneurial success.

Moderation effects: The hypothesized moderating roles of Social Network Cohesion (SN) and Local Policy Support (LP) were not statistically significant. Specifically, the interaction terms SN×IP→IC ($\beta = -0.050$, n.s.) and LP×IP→IV ($\beta = -0.010$, n.s.) yielded negligible results.

Although these non-significant findings diverge from expectations, they offer critical contextual insights into entrepreneurship in institutionally weak or transitional economies. For Social Network Cohesion, the result suggests that while local networks are essential for trust and social legitimacy, they may lack technical knowledge, financial leverage, or market connectivity to enhance the knowledge effects of IP protection. Such networks often provide social support rather than market-oriented collaboration, limiting their contribution to intellectual capital development-a finding consistent with Puffer et al. (2010).

Similarly, the absence of a moderating effect for Local Policy Support indicates that provincial or district-level policies are fragmented or inadequately aligned with national IP and innovation systems. Weak institutional coherence reduces their capacity to amplify IP-driven innovation effects. In other words, formal national mechanisms (e.g., IP laws) exert stronger and more consistent influence than localized or symbolic policy initiatives, reflecting the "institutional voids" common in developing regions.

5.2. Interpretation and theoretical discussion

The absence of significant moderating effects (H5 and H6) does not weaken the model but rather illuminates the contextual realities of ethnic minority entrepreneurship in disadvantaged settings. The results reveal that formal institutional mechanisms, such as national IP protection frameworks, have a direct and robust impact on entrepreneurial resources and outcomes, whereas informal networks and local policies lack the capacity to amplify these effects.

Table 4: Structural model results

Hypothesis	Path	β	Result
H1	IC → SU	0.352***	Supported
H2	IP → IC	0.331***	Supported
H3	IP → EM	0.632***	Supported
H4	IP → IV	0.432***	Supported
H5	SN × IP → IC	−0.050	Not supported
H6	LP × IP → IV	−0.010	Not supported
H7	EM → SU	0.038	Not supported
H8	IV → SU	0.532***	Supported

***: $p < 0.001$

This outcome reinforces Institutional Theory (North, 1990), which posits that in the absence of mature institutional infrastructure, informal norms and fragmented local initiatives cannot fully substitute for systemic formal mechanisms. Consequently, while social cohesion and local governance remain socially valuable, their economic impact is limited by resource scarcity and policy inconsistency.

These findings underscore a critical policy implication: enhancing the institutional coherence between national IP systems and local development programs, particularly those under OCOP and rural innovation initiatives, is essential for translating institutional protection into sustainable entrepreneurial outcomes. Moreover, strengthening the absorptive capacity of local networks through training, IP literacy, and innovation partnerships could transform social cohesion from a cultural asset into an economic enabler.

Overall, the structural model demonstrates strong empirical validity and theoretical coherence. The positive relationships among IP, IC, and IV confirm that institutional and knowledge-based mechanisms jointly shape entrepreneurial success in developing contexts. Meanwhile, the non-significant roles of EM, SN, and LP highlight the continuing influence of structural and institutional barriers, reaffirming that motivation and networks alone cannot compensate for deficits in resources, innovation infrastructure, and policy alignment.

These findings provide nuanced insights into how institutional quality and resource endowments interact to determine entrepreneurial performance

in emerging economies, contributing to both Institutional Theory and the Resource-Based View within the context of ethnic minority entrepreneurship.

The empirical results provide robust evidence for the central role of intellectual property (IP) protection in shaping the entrepreneurial ecosystem of ethnic minority youth in Vietnam's Northern Midland and Mountainous Region. The analysis confirms that IP protection significantly enhances intellectual capital (IC), entrepreneurial motivation (EM), and innovation capability (IV)-three critical mediating mechanisms that connect institutional frameworks with entrepreneurial performance.

Among these mechanisms, IC and IV emerge as the strongest and most consistent predictors of startup outcomes (SU). These results highlight that knowledge-based resources and innovation capacity-rather than motivational or social factors-constitute the core drivers of entrepreneurial success in resource-constrained and institutionally developing contexts. This finding reinforces both the Resource-Based View (Barney, 1991) and Intellectual Capital Theory (Bontis, 1998), emphasizing that the accumulation and effective use of intangible resources determine long-term competitive advantage.

In contrast, Entrepreneurial Motivation (EM), though strongly influenced by IP protection, exerts no statistically significant direct effect on startup outcomes. This suggests that while institutional protection of ideas may inspire confidence and aspiration among young entrepreneurs, motivation alone cannot overcome structural barriers such as capital shortages, skill gaps, and market inaccessibility. The result underscores the contextual constraint that in underdeveloped economies, intentionality must be matched with resource capability to generate tangible entrepreneurial performance (Autio and Acs, 2010).

Similarly, the non-significant moderating effects of Social Network Cohesion (SN) and Local Policy Support (LP) reveal a critical insight into the institutional weakness and fragmentation of regional entrepreneurial ecosystems. Traditional social networks, though valuable for trust and community support, appear insufficient to amplify the institutional benefits of IP protection, largely due to their limited financial leverage and weak linkages to innovation systems. Likewise, local policy initiatives often lack coherence and operational depth, preventing them from reinforcing national IP frameworks or effectively supporting entrepreneurial innovation at the grassroots level.

Taken together, these findings expose a structural asymmetry between formal institutional mechanisms, which effectively foster knowledge creation and innovation, and localized informal systems, which remain underdeveloped and fragmented. While IP protection strengthens the foundation for innovation and intellectual capital formation, persistent constraints such as inadequate infrastructure, limited absorptive capacity, and uneven policy enforcement continue to hinder the full realization of entrepreneurial potential in disadvantaged regions.

In sum, the study provides empirical and theoretical evidence that in emerging economies, institutional quality and resource endowment-rather than individual intent or social embeddedness-determine entrepreneurial success. These insights lay a strong foundation for the subsequent sections on theoretical contributions and policy implications, offering valuable guidance for scholars and policymakers seeking to design integrated, capability-oriented entrepreneurship frameworks in institutionally weak environments.

6. Discussion

The empirical results of this study align with a substantial body of research highlighting the institutional importance of intellectual property (IP) protection in stimulating innovation and entrepreneurship. Consistent with Hall et al. (2014) and Autio and Acs (2010), the findings confirm that IP protection strengthens intellectual capital (IC) and innovation capability (IV)-two pivotal mechanisms through which institutional frameworks foster entrepreneurial performance.

However, the findings diverge from evidence observed in developed economies, where entrepreneurial motivation (EM) is frequently reported as a strong predictor of startup outcomes (Krueger et al., 2000). In the context of ethnic minority youth in Vietnam's Northern Midland and Mountainous Region, EM did not exert a significant effect on entrepreneurial performance. This contrast underscores the reality that motivation, though necessary, is not sufficient in environments characterized by limited access to finance, technology, and formal market institutions.

Moreover, contrary to theoretical expectations derived from Social Network Theory (Granovetter, 1985) and Institutional Theory (North, 1990), neither social network cohesion (SN) nor local policy support (LP) significantly moderated the structural relationships. These results suggest that in marginalized or institutionally weak regions, traditional social networks and local policy interventions lack the institutional coherence, technical expertise, or financial capacity required to amplify the benefits of IP protection. This finding aligns with Puffer et al. (2010), who observed that informal networks in transitional economies often provide social legitimacy rather than market-oriented resources.

This study makes several notable theoretical contributions. First, it extends Institutional Theory and the Resource-Based View (RBV) by demonstrating that IP protection functions as a dual institutional and strategic mechanism. It not only enhances entrepreneurial confidence and legitimacy but also stimulates investment in intangible, knowledge-based assets that are valuable, rare, inimitable, and non-substitutable (Barney, 1991).

Second, the strong mediating effects of IC and IV empirically support Intellectual Capital Theory (Bontis, 1998) and the innovation-focused perspectives of Krueger et al. (2000) and Meghwal et al. (2023). These findings highlight that knowledge and innovation-not individual drive-constitute the principal conduits linking institutional quality to entrepreneurial outcomes.

Third, the non-significant role of EM offers a contextually grounded refinement to behavioral theories of entrepreneurship. It suggests that in structurally constrained settings, institutional and resource-based factors may override motivational determinants, revealing the limits of intention-based models when material and institutional conditions are underdeveloped.

Finally, the absence of significant moderating effects from SN and LP contributes to the literature by illustrating the contextual contingency of institutional mechanisms. Whereas social capital and local policy are often theorized as amplifiers of institutional effects, this study reveals that their influence may be diminished in peripheral regions where institutional voids persist. This insight advances the cross-contextual understanding of entrepreneurship in developing and marginalized economies, enriching theories of institutional embeddedness and social capital.

The findings carry several practical and policy-oriented implications. For policymakers, the results underscore the urgency of embedding IP protection within broader entrepreneurship development programs. This entails:

- Enhancing IP literacy and awareness among ethnic minority entrepreneurs;
- Simplifying IP registration and enforcement to reduce procedural barriers;
- Integrating IP frameworks with training in innovation management, digitalization, and knowledge commercialization.

Moreover, capacity-building initiatives should prioritize strengthening IC and IV, as these constitute the most direct levers for improving entrepreneurial performance. Rather than focusing solely on motivational programs or subsidies, governments should invest in knowledge transfer, technological upgrading, and local innovation ecosystems that connect entrepreneurs with research institutions and markets.

For practitioners, particularly ethnic minority entrepreneurs, the results highlight the importance of building intellectual resources and innovation capabilities over reliance on informal support systems. Entrepreneurs should leverage training, digital tools, and collaborative ventures to transform cultural knowledge into marketable products.

At the community level, local governments and support organizations should move beyond traditional trust-based or kinship networks and foster market-oriented, digitally connected, and cooperative linkages. Such networks can enhance access to finance, expand distribution channels, and promote knowledge-sharing, thereby translating institutional protection into sustainable entrepreneurial growth.

7. Conclusion

This study provides compelling empirical evidence that IP protection significantly enhances intellectual capital (IC), entrepreneurial motivation (EM), and innovation capability (IV) among ethnic minority youth entrepreneurs. However, only IC and IV were found to exert significant and positive effects on startup outcomes (SU), while EM had no direct impact. Additionally, neither social network cohesion (SN) nor local policy support (LP) moderated the examined relationships.

These findings indicate that institutional safeguards such as IP protection are most effective when they are translated into knowledge-based resources and innovation capacity, rather than when policymakers rely on individual motivation or fragmented local initiatives. The results contribute to a nuanced understanding of how institutional quality interacts with resource capabilities to determine entrepreneurial performance in underdeveloped regions.

From a managerial and policy perspective, several strategic priorities emerge:

- Institutional strengthening: Enhance IP awareness, streamline registration processes, and ensure consistent enforcement of IP laws at both national and local levels.
- Capacity building: Prioritize initiatives that develop intellectual capital and innovation capability through education, technology training, and research partnerships.
- Ecosystem integration: Embed IP protection within broader entrepreneurial support systems, linking it with financing mechanisms, digital transformation programs, and knowledge-transfer networks.
- Community transformation: Redesign local policy frameworks to promote market-oriented and innovation-driven clusters, particularly within OCOP and rural entrepreneurship programs.
- Inclusive development: Encourage the participation of ethnic minority youth by providing accessible mentorship, financial inclusion, and e-commerce integration platforms that connect local products to national and international markets.

These recommendations emphasize that institutional mechanisms must be coupled with tangible resource development to generate sustainable entrepreneurial success.

Several limitations should be acknowledged. First, the cross-sectional design restricts the ability to establish causality or observe temporal evolution in entrepreneurial development. Second, the measurement of SN and LP was based on perceptual

survey data, which may not capture the qualitative depth and heterogeneity of social or policy influences. Third, the study focuses specifically on Vietnam's Northern Midland and Mountainous Region, which, while representative of marginalized contexts, may limit the generalizability of findings to other institutional settings.

Future studies should adopt longitudinal or mixed-method designs to capture dynamic causal mechanisms and explore the evolution of institutional–entrepreneurial relationships over time. Comparative research across regions or countries could enhance external validity and illuminate contextual differences in institutional quality and social capital.

Further, investigating additional moderating variables-such as digital adoption, institutional trust, gender, or access to finance-could deepen theoretical insights into how IP protection translates into entrepreneurial performance across diverse ecosystems.

List of abbreviations

AVE	Average variance extracted
CR	Composite reliability
EM	Entrepreneurial motivation
f^2	Effect size
HTMT	Heterotrait–Monotrait ratio
IC	Intellectual capital
IP	Intellectual property
IPR	Intellectual property rights
IV	Innovation capability
LP	Local policy support
n.s.	Not significant
OCOP	One commune one product
PLS-SEM	Partial least squares structural equation modeling
Q^2	Predictive relevance
R&D	Research and development
R^2	Coefficient of determination
RBV	Resource-based view
SBIR	Small business innovation research
SC	Social capital
SN	Social network cohesion
SU	Startup outcomes
VRIN	Valuable, rare, inimitable, and non-substitutable
α	Cronbach's alpha
β	Standardized path coefficient

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Compliance with ethical standards

Ethical considerations

All research activities involving human participants complied with the ethical standards of the institutional and national research committees, as well as the principles outlined in the Declaration of Helsinki. Prior to data collection, all participants were fully informed about the research objectives, procedures, and their rights to confidentiality and voluntary participation. Written informed consent was obtained from every respondent. The research protocol was reviewed and approved by the Research Ethics Committee of Thai Nguyen University of Economics and Business Administration, ensuring that data collection and analysis adhered to the highest ethical and professional standards.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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