Resilience through Coopetition: Evidence from Small Tech Firms in Malaysia

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ABSTRACT

This study investigates the potential of coopetition strategies in assisting small technical firms to overcome challenges such as limited resources, innovation barriers, and the COVID-19 pandemic. Through qualitative interviews with owners and managers of five small technical firms in Penang, Malaysia, the research explores how coopetition—simultaneous collaboration and competition among firms—can enhance resilience and performance. Findings reveal that coopetition helps firms mitigate risks, share resources, and access new markets, though some firms prefer personalized strategies post-pandemic. The study contributes to the literature on coopetition by highlighting its benefits and limitations in small technical firms, offering practical insights for sustainable growth in volatile environments.

Keywords: Coopetition strategy, small technical firms, challenges, COVID-19, resource sharing

INTRODUCTION

Small and medium-sized enterprises (SMEs) are a cornerstone of national economies, contributing significantly to employment creation, innovation, and economic growth. Despite their importance, small technical firms frequently operate under severe resource constraints, limiting their capacity to innovate and compete effectively (Thomas & Douglas, 2024). These constraints became even more pronounced during the COVID-19 pandemic, which disrupted supply chains, reduced market demand, and increased uncertainty (Kuckertz et al., 2020).

One emerging strategic response to such challenges is coopetition, where firms engage in collaborative arrangements with competitors while simultaneously competing in overlapping markets (Brandenburger et al., 1996). This paradoxical relationship allows firms to leverage shared resources, access new capabilities, and innovate more rapidly. However, coopetition also entails potential risks, such as knowledge leakage and opportunistic behavior, which may undermine competitive advantage (Ritala & Hurmelinna-Laukkanen, 2013).

Issues

In recent years, many small technical firms have struggled to cope with crisis situations such as the COVID-19 pandemic. The pandemic has triggered profound changes in the business environment, compelling small technical firms to rapidly and extensively adopt digital technologies. Delayed adoption increases the risk of widening gaps between environmental demands and firm capabilities. Consequently, many small technical firms have made efforts to implement digital solutions within days rather than months (Priyono et al., 2020).

Due to their size and ownership structure, small technical firms often face persistent challenges related to profitability and liquidity, leaving them highly vulnerable to external shocks. Indeed, crises such as the COVID-19 pandemic disproportionately affect these firms (Juergensen et al., 2020). The pandemic has become a symbolic illustration of the volatility and uncertainty in today's economic environment, underscoring the need for small technical firms to respond with increasing speed and 3disruptive strategies to maintain competitiveness and ensure long-term sustainability (Bertello et al., 2022).

A major constraint faced by small technical firms lies in their limited resources, which restrict their capacity to invest in infrastructure development, marketing, advertising, and technological upgrades. This limitation often makes it difficult for them to compete with larger firms that possess greater financial capacity. In this context, it remains uncertain whether resource-constrained firms should focus more on exploration or exploitation when pursuing organizational flexibility (Wenke et al., 2021). The COVID-19 pandemic has further intensified these disparities between small and large firms (Juergensen et al., 2020). Nevertheless, the relatively small scale, private ownership, and flat organizational structures of small technical firms often make them more agile and adaptable than larger corporations—advantages that have proven valuable in navigating the crisis (Juergensen et al., 2020).

Innovation is another critical challenge for small technical firms. As the backbone of many national economies, these firms must prioritize innovation and differentiation to maintain market relevance. Without continuous innovation in products, services, and business models, their long-term prospects appear uncertain (Bertello et al., 2022). Open innovation offers a promising framework, enabling small technical firms to leverage both inbound and outbound knowledge flows to accelerate product and process innovation (Singh et al., 2021). However, business model innovation efforts are often inconsistent in terms of cost, duration, and outcomes (Hock-Doepgen et al., 2021).

A further consideration is whether small technical firms will continue to engage in coopetition strategies or pursue entirely independent business approaches. As these firms grow, they often encounter substantial challenges related to internal processes and organizational structure (Di Pietro et al., 2022). This uncertainty provides fertile ground for future research, particularly in exploring the strategic choices of small technical firms in the post-pandemic era. This tension prompts a critical research inquiry:

Research Question (RQ): How do small technical firms navigate the trade-offs between coopetition and independent strategies to achieve competitive advantage?

LITERATURE REVIEW

The concept of coopetition—simultaneous collaboration and competition between firms—was first popularized by (Brandenburger et al., 1996), who argued that business is not merely a zero-sum game but one where companies can create joint value while competing to capture their share. Bengtsson & Kock (2000) further conceptualized coopetition as a paradoxical strategy, emphasizing that it combines collaboration and rivalry in dynamic ways. Empirical studies consistently highlight that coopetition enhances innovation capacity, market access, and efficiency, while also introducing risks such as knowledge leakage and opportunism (Corbo et al., 2023; Ritala & Hurmelinna-Laukkanen, 2013).

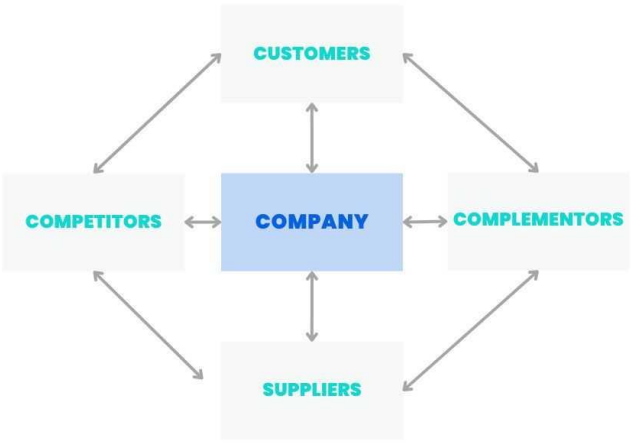

Figure 1: Value net framework by Brandenburger and Nalenbuff (1996)

Benefits and Risks of coopetition for Small Firms

Evidence across SMEs shows coopetition can improve innovation performance, digital uptake, and agility by pooling scarce assets and know-how (Guo et al., 2023; Singh et al., 2021). Joint procurement, shared infrastructure, and co-development can lower costs and speed time to market capabilities that proved critical during shocks like COVID-19 (Kuckertz et al., 2020). Offsetting these gains are well-documented hazards: misappropriation of tacit knowledge, misaligned incentives, and contracting/monitoring costs that can erode net benefits, especially where governance safeguards are weak (Ritala & Hurmelinna-Laukkanen, 2013; Williamson, 1989).

Despite its promise, the adoption of coopetition in small technical firms remains understudied, especially in developing economies. Much of the existing literature has focused on large corporations or high-tech clusters in advanced markets, leaving a gap in understanding how resource-constrained firms in emerging contexts navigate this duality (Adelekan et al., 2021; Singh et al., 2021). Rather than treating theories in isolation, the study integrates five perspectives of theories to explain when coopetition is attractive for small technical firms.

Resource-Based and Knowledge-Based Perspectives

The Resource-Based Theory (RBT) suggests that firms achieve competitive advantage through the strategic use of valuable, rare, inimitable resources and good organization (Barney & Arikan, 2005). For small technical firms facing financial and infrastructural constraints, coopetition represents a mechanism to pool complementary assets and overcome resource shortages (Guo et al., 2023). Extending RBT, the Knowledge-Based View (KBV) argues that knowledge is the most strategically significant resource (Grant, 1996). Coopetition enables small firms to engage in knowledge-sharing arrangements with competitors while retaining their core expertise, thus accelerating innovation without full dependency.

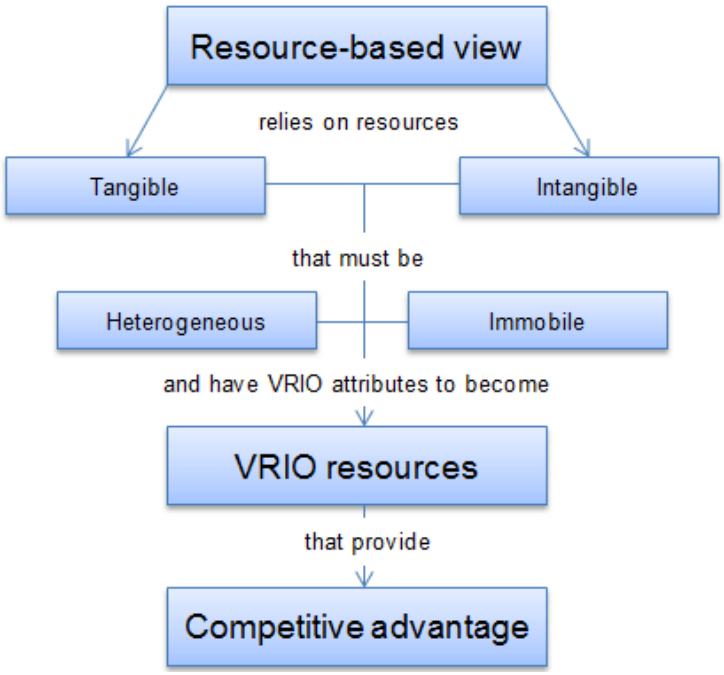

Figure 2: Resource based theory by Barney (1991)

Dynamic Capabilities Theory

While RBT and KBV explain the "what" of resources, the Dynamic Capabilities Theory (Teece, 2007) explains the "how." Coopetition can strengthen firms' ability to sense emerging opportunities, seize collaborative ventures, and reconfigure strategies in response to crises such as the COVID-19 pandemic. For instance, shared innovation projects and joint digitalization efforts enable small firms to adapt more quickly than if they acted independently. This lens emphasizes coopetition as not only a survival tactic but a long-term capability-building mechanism.

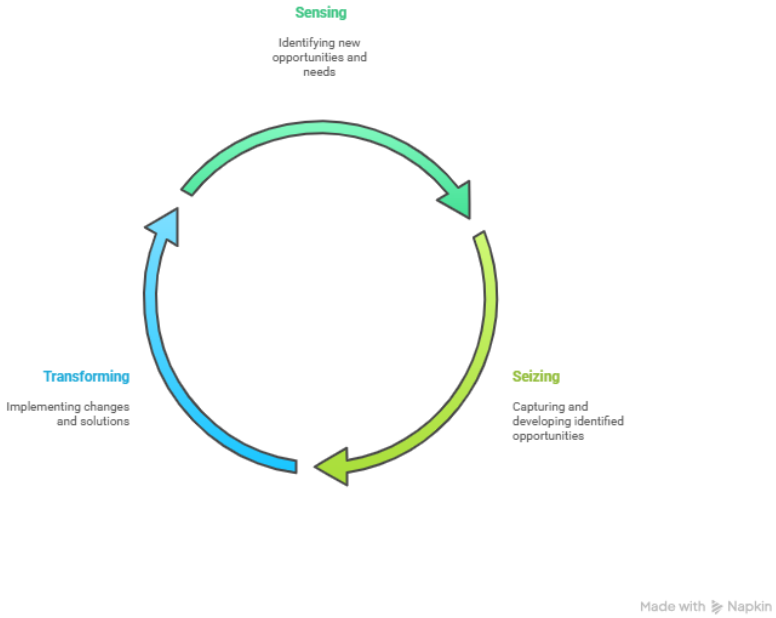

Figure 3: Dynamic capability theory by Teece, Pisano & Shuen, 1997

Institutional pressure

The decision to pursue coopetition is not purely strategic but is shaped by institutional contexts. According to Institutional Theory (DiMaggio & Powell, 2010), firms are influenced by coercive pressures (e.g., government support schemes, regulatory environments), normative pressures (industry standards, professional networks), and mimetic pressures (imitating successful competitors). Small firms in Malaysia, for example, may be more likely to engage in coopetition when government recovery programs encourage resource pooling or when peer firms demonstrate successful partnerships.

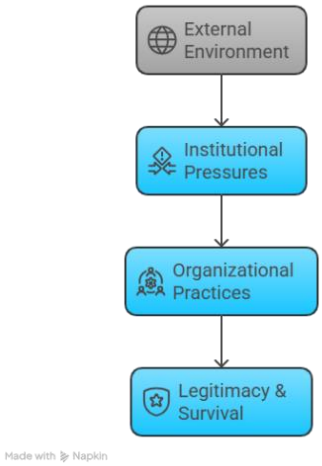

Figure 4: Institutional theory by DiMaggio & Powell, 2010

Social Capital and Networks

Coopetition outcomes depend heavily on the quality of inter-firm relationships. Social Capital Theory (Nahapiet & Ghoshal, 1998) posits that networks of trust, reciprocity, and shared norms facilitate collaboration and reduce

the risks of opportunism. For small firms embedded in tight-knit local ecosystems, relational capital can be a decisive enabler of successful coopetition. Conversely, where trust is low, firms may prefer independent strategies despite resource constraints.

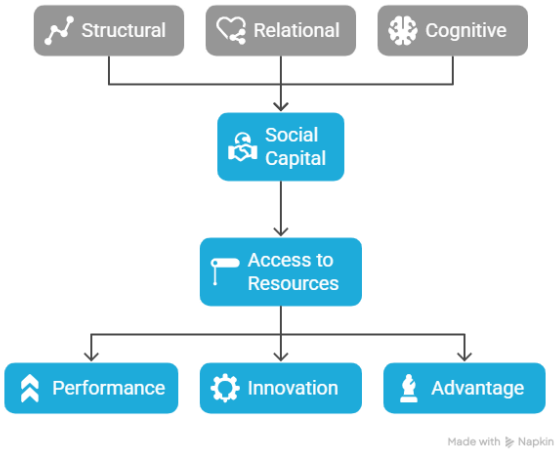

Figure 5: Social capital theory by Nahapiet & Ghoshal, 1998

Transaction Cost Considerations

Finally, Transaction Cost Economics (TCE) (Williamson, 1989) explains why some firms resist coopetition. While resource-sharing reduces duplication, it also introduces governance costs related to monitoring, coordination, and safeguarding proprietary knowledge. Firms that perceive transaction costs to outweigh benefits may instead prioritize autonomy and customized strategies. This perspective helps explain the variation in coopetition adoption among small firms, even when facing similar constraints.

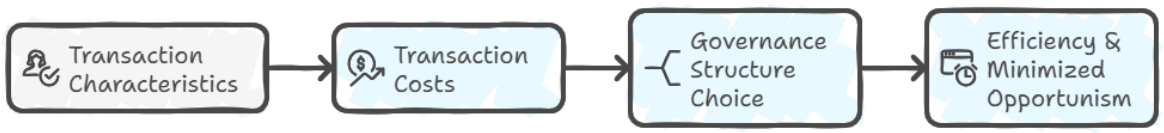

Figure 6: Transaction cost economics by Williamson, 1985

Together, these frameworks suggest that coopetition is not a uniform strategy but a context-dependent and capability-enhancing mechanism. Resource pooling and knowledge-sharing provide immediate survival advantages (RBT, KBV), while dynamic capabilities ensure long-term adaptability. Institutional contexts and social capital shape the willingness to engage, and transaction cost concerns explain resistance. By integrating these perspectives, this study advances a more nuanced understanding of coopetition in small technical firms, particularly in volatile environments such as the post-pandemic economy.

METHODOLOGY

This study adopted a qualitative methodology to explore the challenges faced by small technical firms and their use of coopetition strategies (Creswell, 2016). An exploratory study design was employed, focusing on in-depth understanding rather than generalization (Eisenhardt, 1989). The primary data collection method was semi-structured interviews (DiCicco-Bloom & Crabtree, 2006). The interviews provided participants the freedom to respond and offer new perspectives, enhancing the scope of the investigation (Brinkmann, 2016).

Five participants from small technical firms in Penang, Malaysia, were interviewed. The selection criteria for interviewees were guided by their direct involvement in firm-level innovation and resource management. A sample size of five was considered sufficient, as qualitative research emphasizes depth of insight rather than breadth of coverage. This decision aligns with Creswell, J. W. (1998) recommendation of 5–25 interviews for a

phenomenological study and 20–30 for a grounded theory study, and is further supported by Bekele & Ago (2022), who argue that even small samples can provide adequate data sufficiency and meaningful insights in qualitative research.

The selection criteria for interviewees were:

- Working in a managerial position or as an owner with decision-making power.
- The firm operates in Penang only.
- The business has been operating for more than five years.

The data collected from the interviews were analyzed using thematic analysis, a method chosen for its reliability, adaptability, and user-friendly nature in assessing qualitative data (Kiger & Varpio, 2020).

FINDINGS

Two main strategic orientations and viewpoints towards coopetition were identified through thematic analysis of interviews with the owners and managers of five small technological enterprises in Penang, there are as follows:

1. **Engagement in Coopetition (2 firms):**

These firms actively collaborated with competitors by sharing resources, exchanging knowledge, and co-developing solutions. They perceived coopetition as a way to mitigate risks, accelerate digital adoption, and expand market access during and after the COVID-19 pandemic. Participants emphasized that shared initiatives reduced costs and allowed access to capabilities otherwise unavailable within their firms.

2. **Preference for Independent Strategies (3 firms):**

Three participants resisted coopetition, instead pursuing customized, firm-specific approaches. They valued flexibility, autonomy, and control over knowledge as critical for maintaining competitiveness. Concerns about opportunism, knowledge leakage, and governance costs were cited as reasons for avoiding partnerships, even when resource constraints were acute.

Figure 7: Five small technical firms in Penang towards coopetition

Based on the general findings, this disparity suggests that coopetition is not universally accepted in small technical enterprises; rather, it is dependent on firm-specific resources, trust levels, and perceptions of institutional support.

Detailed findings from interview analysis

The thematic analysis of interviews with five small technical firms in Penang identified two overarching themes that explain how these firms approach coopetition:

1. **Motivations for engaging in coopetition**, and

2. **Barriers and concerns about coopetition**.

These themes illustrate both the perceived benefits of coopetition and the reasons why some firms remain reluctant to pursue it.

Motivations for engaging in coopetition

Two participants expressed strong interest in continuing coopetition beyond the pandemic. They viewed coopetition as a strategic enabler that strengthened resilience, innovation, and competitiveness in volatile environments, highlighting several perceived advantages:

- **Resource Sharing and Cost Reduction:**

Firms emphasized that pooling financial and technological resources reduced individual burdens. For example, joint procurement of digital tools and collaborative training programs were cited as cost-saving measures that would have been unattainable individually.

“Our company will cooperate with other companies… sometimes when our company lack of worker that day, the other company will borrow some workers to us.” — Participant E

“Our company collaborate with other company on projects like R&D, marketing campaigns, or infrastructure by pooling resources and splitting costs. All companies concerned may experience huge cost reductions as a result of this.” — Participants (A/B/E)

- **Access to New Capabilities:**

Coopetition allowed small firms to tap into complementary expertise from competitors. Participantsnoted that knowledge exchange helped fill skill gaps in digitalization, product development, and process innovation.

“We can combine our knowledge and expertise to develop new solutions, products or services to address the unique challenges posed by the pandemic.” — Participants (A/D)

- **Market Expansion and Risk Mitigation:**

By collaborating on specific projects, firms accessed markets they could not enter alone, while also spreading risks during uncertain periods such as the COVID-19 pandemic. One manager described coopetition as a way to “share the burden in bad times and share the opportunities in good times.”

“We can use this strategy to enter new markets or explore new business opportunities that might be challenging to pursue individually. By combine the strengths of each companies, the collaboration enhances the chances of success in uncharted territories.” — Participants (A/C/D)

“Moreover, it can help mitigate the risk of our company and other companies that we cooperate. It can help spread risks among the companies. If we face challenges or uncertainties, the burden is shared, reducing the impact on any single company.” — Participant C

Barriers and Concerns About Coopetition

In contrast, three participants expressed hesitation or outright resistance toward coopetition. They revealed that coopetition is often perceived as risky and difficult to govern, particularly in environments where trust and institutional safeguards are weak. Their reluctance stemmed from three main concerns:

- **Fear of Knowledge Leakage:**

Several managers worried that sharing information with competitors could lead to the unintended transfer of proprietary knowledge or loss of competitive advantage. This concern was especially strong in relation to product design and digital processes.

“partners today may become stronger competitors tomorrow.” — Participant C

Opportunism and Lack of Trust:

Participantscited skepticism about competitors' intentions. They feared that partners might exploit collaborative arrangements for short-term gains while undermining mutual trust.

"partners today may become stronger competitors tomorrow." — Participant C

- **High Coordination and Governance Costs:**

Independent strategies were perceived as less complex and easier to manage. Firms that avoided coopetition argued that negotiating, monitoring, and enforcing agreements consumed too many resources compared to operating independently.

"Independent strategies were perceived as less complex and easier to manage. Firms that avoided coopetition argued that negotiating, monitoring, and enforcing agreements consumed too many resources compared to operating independently." — Participant A

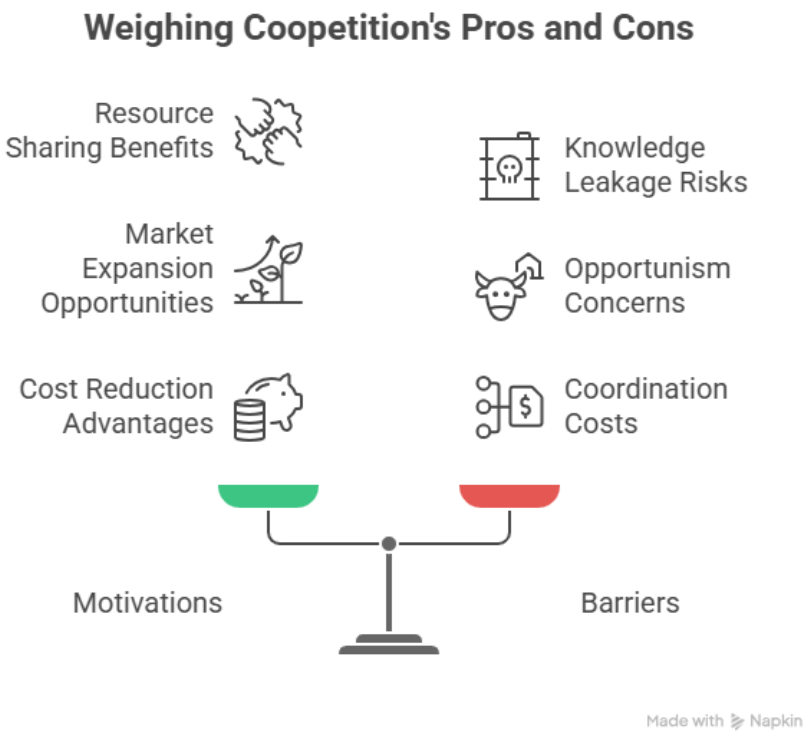

Figure 8: Study's framework

DISCUSSION

This study set out to address the research question: How do small technical firms navigate the trade-offs between coopetition and independent strategies to achieve competitive advantage? The literature has long established that coopetition can provide SMEs with access to resources, knowledge, and innovation (Bengtsson & Kock, 2000; Brandenburger et al., 1996). However, a significant research gap remained regarding its relevance for small technical firms, particularly in volatile contexts such as the COVID-19 pandemic. Most prior studies have focused on large firms or high-tech clusters in advanced economies, leaving limited understanding of how resource-constrained small firms in emerging markets balance the paradox of cooperation and competition.

The findings of this study address this gap by showing that small technical firms' engagement in coopetition is both motivated by opportunities and burdened by constraints, resulting in divergent strategic orientations. Three key insights emerged.

Coopetition as a Mechanism for Resource Seeking

The study confirms that coopetition helps small firms overcome the resource constraints widely identified in the literature (Singh et al., 2021). Firms engaging in coopetition pooled resources and shared knowledge to accelerate digital transformation, reduce costs, and broaden market access. This extends prior work by demonstrating that, in small technical firms, coopetition does not simply supplement resources but also contributes to dynamic capabilities (Teece, 2007), enabling firms to sense opportunities and reconfigure in response to crises. By linking resource-seeking behavior to adaptive capability-building, this study advances theoretical understanding of why coopetition may be particularly valuable for small technical firms in uncertain environments.

Challenges and Constraints to Coopetition

At the same time, the findings highlight barriers that were underexplored in prior research. While past studies emphasized the benefits of coopetition, this study shows that knowledge leakage risks, trust deficits, and governance costs act as critical deterrents for small firms. Transaction Cost Economics (Williamson, 1989) helps explain why some participantsjudged independence to be more efficient than collaboration, while Social Capital Theory (Nahapiet & Ghoshal, 1998) underscores the centrality of trust for successful cooperation.

This contributes to filling the research gap by demonstrating that coopetition in small technical firms is often constrained not just by resource scarcity, but also by institutional weaknesses. In the Malaysian context, limited intellectual property protections and weak enforcement mechanisms amplify firms' reluctance to collaborate, echoing Institutional Theory (DiMaggio & Powell, 2010). Thus, the study shows that barriers to coopetition in small technical firms are both relational and institutional — a nuance that is largely missing from the broader coopetition literature.

Divergent Engagement Strategies

The most significant contribution lies in explaining the strategic divergence observed among firms. While some adopted coopetition to enhance adaptability and long-term competitiveness, others rejected it in favor of independent, customized strategies. This divergence illustrates that coopetition is not a universal strategy but a contingent choice shaped by firm-specific orientations, trust levels, and perceived risks.

By capturing this heterogeneity, the study addresses the research gap on whether coopetition is a viable long-term strategy for small technical firms. The findings demonstrate that adoption depends not only on structural resource constraints but also on subjective perceptions of risk and trust. This advances the literature by moving beyond the binary framing of coopetition as "beneficial" or "risky" to show that firms actively weigh its trade-offs in relation to their internal capabilities and external environment.

Theoretical and Practical Implications

Theoretical Contribution:

This study contributes to the coopetition literature by:

1. Expanding understanding of coopetition in small technical firms, a context previously underexplored.
2. Demonstrating how coopetition simultaneously builds dynamic capabilities while being constrained by transaction costs and institutional weaknesses.
3. Showing that engagement is not uniform but divergent, shaped by social capital and strategic orientation, thereby addressing calls for more nuanced perspectives on coopetition in SMEs.

Practical Implications:

For practitioners, the results suggest that coopetition can enhance resilience, innovation, and competitiveness, but only when supported by trust-building mechanisms and governance safeguards. Managers should carefully evaluate not only potential resource benefits but also the relational and governance costs of collaboration. For

policymakers, the findings highlight the importance of strengthening institutional frameworks—such as intellectual property protections, legal safeguards, and industry platforms—to reduce transaction costs and foster fair and sustainable coopetition practices.

Applicability beyond penang

Although Penang provides a fertile setting to observe coopetition among small technical firms, but the underlying principle of balancing complementarities against motivation and barriers of coopetition generalises beyond the state. Foundational work on coopetition and paradox navigation suggests such rival collaboration can unlock value by combining complementary assets while maintaining competitive tension, thereby accelerating innovation, expanding market demand, and reducing risk through shared costs and knowledge.

Within Malaysia, the Klang Valley's dense supplier–buyer networks and IP-intensive verticals amplify knowledge spillovers but also heighten leakage risk, making platform-mediated collaboration and early formalisation (NDAs, background/foreground IP) especially important. Public instruments such as Malaysia Digital Economic Corporation (MDEC) grants can underwrite the fixed costs of shared digital infrastructure that record provenance and access.

In Johor and the Northern Corridor, being close to Singapore makes group buying and shared product testing more worthwhile, and the new Johor–Singapore Special Economic Zone (SEZ) should make it even easier and cheaper for SME groups to find partners and do deals. In East Malaysia, where companies are farther apart and supply chains are longer, online platforms can help teams work together, but someone still needs to coordinate this is where national Industry 4.0 programs step in with guided support and co-funding based on readiness checks.

The core idea balancing complementarities with the motivations and barriers of coopetition travels beyond Penang. With light-touch governance, early IP hygiene, and region-specific facilitation, Malaysia's small tech firms can turn "rival collaboration" into faster innovation, lower unit costs, and broader market access, while public programmes help defray the fixed costs of shared digital infrastructure.

Practical roadmap for policymakers and managers

Small tech firms like those in this study face practical hurdles when trying to implement coopetition. Below are the main pin points and simple actions for policymakers and managers to consider.

- **IP costs are high.** NDAs, registrations, and enforcement are expensive.

Quick fixes: provide ready-to-use contract templates; offer small vouchers for first filings/mediation; limit disclosures with modular designs.

- **Paperwork and coordination are heavy.** Multi-firm projects create scope creep and disputes.

Quick fixes: standard milestone checklists; a neutral platform to log access and deliverables; co-fund a shared project manager for SME consortia.

- **Low trust.** Fear of idea theft blocks collaboration.

Quick fixes: start with small, low-risk pilots; use reciprocal exchanges (e.g., short staff secondments); show partner "track records" on platforms.

- **Data rules are unclear.** Who owns what data and how it's secured?

Quick fixes: adopt a simple data-sharing rubric (purpose, access tiers, retention); require basic cybersecurity standards; use escrowed repositories for sensitive files.

- **Uneven capabilities.** Different digital maturity slows joint work.

Quick fixes: run a light readiness check; tie support to closing specific gaps (tools, training); rotate shared experts across firms.

- **Regulatory grey areas.** Uncertainty about competition law and grant rules deters action.

Quick fixes: publish short "what's allowed" guides (pre-competitive R&D, standards); require clear upfront scopes; offer rapid advisory hotlines.

- **Shared tools cost money to maintain.** Platforms for IP, logs, and audits need ongoing funding.

Quick fixes: shift to tapered, performance-based co-funding; pool demand for volume pricing; review usage annually to keep only what works.

Lower fixed legal costs, cut coordination burden, build trust in small steps, set simple data/cyber rules, close capability gaps, clarify what's "safe," and fund shared tools sustainably. This turns high-level recommendations into actions SMEs can actually take.

CONCLUSION

This study examined how small technology firms navigate the tension between cooperating with competitors and remaining independent. Evidence from Penang as a focal study indicates that coopetition is not a universal remedy but a contingent choice shaped by resource needs, trust, and the expected costs of governance and knowledge protection. Firms gravitate toward coopetition when complementary capabilities and market access outweigh risks; they avoid it when fears of opportunism, IP leakage, or coordination burdens dominate.

For managers, the implication is to assess partnership decisions through a structured lens—resources required, safeguards available, and relational readiness—before committing. For policymakers and ecosystem builders, strengthening IP enforcement, standardizing collaboration templates, and providing neutral platforms can lower transaction costs and expand safe spaces for joint innovation.

This research is limited by its small, single-region sample and qualitative scope. Future work should test the proposed contingencies across regions and over time, and link governance choices to objective performance outcomes. Even so, the findings offer a practical decision frame that helps small tech firms balance collaboration with competitive discipline.

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