



Business Model Innovation under Digital Disruption: How Platform Ecosystems Moderate the Relationship between Dynamic Capabilities and Firm Resilience

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Abstract

Digital disruption has fundamentally altered the competitive landscape, compelling firms to reconfigure their business models to survive and thrive. While prior research acknowledges the role of dynamic capabilities in fostering resilience, the mechanisms through which business model innovation and platform ecosystems moderate this relationship remain underexplored. Drawing on dynamic capabilities theory and ecosystem literature, this study investigates how platform ecosystems moderate the link between business model innovation and firm resilience under digital disruption. Using a mixed-method approach—survey data from 312 firms across manufacturing, retail, and technology sectors, supplemented by four case studies—we find that business model innovation partially mediates the relationship between dynamic capabilities and resilience. More importantly, platform ecosystem integration significantly moderates this mediated relationship, such that firms embedded in multi-sided digital platforms exhibit stronger resilience gains from dynamic capabilities than standalone firms. The findings contribute to strategic management by integrating business model innovation and ecosystem theory into resilience research. Practically, the study offers a roadmap for managers to leverage platform ecosystems as resilience amplifiers during turbulent digital transitions.

Keywords: Digital disruption; Dynamic capabilities; Platform ecosystems; Firm resilience; Moderation analysis
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1. Introduction

The advent of digital technologies—cloud computing, AI, IoT, and blockchain—has triggered unprecedented disruption across industries (Vial, 2019). Traditional barriers to entry have eroded; incumbents such as Blockbuster, Nokia, and Toys “R” Us have collapsed despite possessing superior resources, while platform-native firms like Amazon, Alibaba, and Shopify have thrived (Teece, 2018). This paradox suggests that resource ownership alone does not guarantee survival. Instead, a firm’s ability to innovate its business model continuously—how it creates, delivers, and captures value—may determine its resilience in the face of digital shocks (Foss & Saebi, 2017).

Resilience—the capacity to anticipate, absorb, adapt to, and recover from disruptive events—has become a strategic imperative (Ortiz-de-Mandojana & Bansal, 2016). However, most resilience research focuses on supply chain robustness or organizational culture,



overlooking how digital disruption specifically rewires the relationship between internal capabilities and outcomes (Ivanov et al., 2019). Meanwhile, dynamic capabilities (DC)—sensing, seizing, and transforming—are proposed as antecedents of resilience (Teece, 2007). Yet empirical evidence remains mixed: some firms with strong DC fail during disruption, suggesting that missing moderators or mediators exist.

Business model innovation (BMI) is a likely missing link. BMI reconfigures activity systems in response to environmental changes, potentially translating DC into resilience (Amit & Zott, 2012). But BMI alone may be insufficient in a hyperconnected digital economy. Increasingly, firms operate within platform ecosystems (PE)—digital infrastructures that facilitate interactions between independent producers and consumers (Parker et al., 2016). These ecosystems provide data, complementors, and scalability that may amplify the effect of BMI on resilience. However, no study has systematically tested whether platform ecosystems moderate the DC → BMI → resilience pathway.

This study addresses three research questions:

1. Do dynamic capabilities positively influence firm resilience under digital disruption?
2. Does business model innovation mediate this relationship?
3. Does integration into a platform ecosystem moderate the mediated relationship, such that the indirect effect is stronger for platform-based firms?

We answer these questions using a sequential explanatory mixed-method design: a quantitative survey of 312 firms across three disrupted industries, followed by four qualitative case studies to unpack mechanisms. The results show full mediation of DC→BMI→resilience, and significant moderated mediation—the indirect effect is 2.3 times larger for platform-embedded firms.

The article proceeds as follows: Section 2 reviews theoretical foundations. Section 3 develops hypotheses. Section 4 describes methodology. Section 5 presents results, including two charts. Section 6 discusses implications. Section 7 concludes.

2. Theoretical Background

2.1 Digital Disruption as a Contextual Imperative

Digital disruption refers to the process where digital technologies alter value creation logics, often decimating established business models (Christensen et al., 2018). Unlike incremental change, disruption involves architectural shifts: product modularization, disintermediation, and data-driven personalization. For example, fintech disrupted banking by replacing branch-based relationships with app-based ecosystems. This context imposes three demands on firms: speed of reconfiguration, openness to external complementors, and tolerance for temporary efficiency losses (Verhoef et al., 2021). Traditional strategic frameworks (e.g., Porter's five forces) assume relatively stable industry boundaries; digital disruption dissolves boundaries, making ecosystem thinking essential.

2.2 Dynamic Capabilities (DC)

Dynamic capabilities are “the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, 2007, p. 1319). Three micro-foundations are widely accepted: sensing (identifying opportunities/threats), seizing (mobilizing resources to capture value), and transforming (continuous renewal). In the digital context, sensing includes analytics-driven market intelligence; seizing includes rapid



prototyping of digital services; transforming involves decommissioning legacy systems (Warner & Wäger, 2019). While DC is theoretically beneficial, empirical studies show that DC can become rigid if not coupled with willingness to change the business model itself (Eisenhardt & Martin, 2000).

2.3 Business Model Innovation (BMI)

BMI is defined as “a novel way of creating, delivering, and capturing value that fundamentally reshapes the competitive logic” (Foss & Saebi, 2017, p. 201). Unlike product or process innovation, BMI changes the activity system’s architecture—e.g., shifting from product sales to subscription (Xerox), or from asset-heavy to asset-light (Airbnb). Under digital disruption, BMI often involves platformization, data monetization, and ecosystem governance. Crucially, BMI mediates between DC and performance because dynamic capabilities enable the reconfiguration that BMI represents; without actual business model change, DC remains latent (Teece, 2018).

2.4 Firm Resilience

Resilience in strategic management is multidimensional: proactive (anticipatory capability), concurrent (absorptive capacity during shock), and reactive (recovery speed) (Burnard & Bhamra, 2011). Digital disruption tests resilience differently from supply shocks: the shock is not a singular event but a continuous transformation. Resilient firms under digital disruption exhibit three behaviors: decoupling legacy constraints, leveraging ecosystem buffers, and iterative pivoting (Hock-Doepgen et al., 2021). Prior work has not systematically integrated BMI into resilience models.

2.5 Platform Ecosystems as a Moderator

Platform ecosystems are digital structures that enable third-party complementors to co-create value with the platform owner (Gawer, 2014). Examples: Apple’s iOS (app developers), Uber (driver-partners), Shopify (merchants). Key properties: network effects, modular architecture, and shared data governance. For a focal firm, being embedded in a platform ecosystem (as a complementor or orchestrator) provides access to external innovation, demand aggregation, and resilience buffers—e.g., if one revenue stream fails, ecosystem partners may sustain activity (Hein et al., 2020). We argue that PE moderates the BMI→resilience link because ecosystem membership reduces the cost and risk of BMI, and amplifies the reach of new business models.

3. Hypothesis Development

3.1 Dynamic Capabilities and Firm Resilience

Firms with strong sensing capabilities detect digital threats earlier (e.g., declining customer lifetime value due to new entrants). Seizing capabilities allow rapid resource reallocation—e.g., shifting IT budget from legacy ERP to cloud-based microservices. Transforming capabilities institutionalize learning from disruption. Thus, DC should directly enhance resilience by enabling firms to avoid rigidity traps. However, because digital disruption often destroys existing business models, the direct effect may be partial—DC must be expressed through concrete model changes.



H1: Dynamic capabilities are positively associated with firm resilience under digital disruption.

3.2 The Mediating Role of Business Model Innovation

BMI is the mechanism through which DC is externalized. A firm may sense a digital threat (DC sensing) but fail to change its revenue model (e.g., still charging per product rather than subscription). Without BMI, sensing does not translate into resilience. Conversely, successful BMI—such as moving to a freemium model or data-driven personalization—directly enhances resilience by diversifying revenue streams and increasing customer stickiness. Prior studies found that BMI mediates between organizational learning and performance (Teece, 2018), but not specifically for resilience. We posit:

H2: Business model innovation mediates the positive relationship between dynamic capabilities and firm resilience.

3.3 Platform Ecosystems as a Moderator of the BMI–Resilience Link

Platform ecosystem integration changes the effectiveness of BMI in three ways. First, reduced experimentation cost: platform APIs and modular tools allow rapid A/B testing of new business model components (e.g., pricing tiers, feature bundles). Second, network effect amplification: a new business model (e.g., peer-to-peer rental) gains faster adoption because platform participants provide liquidity. Third, buffering: during disruption, platform-mediated revenue from complementors continues even if direct sales drop. Therefore, for platform-embedded firms, a given level of BMI yields higher resilience. For standalone firms, BMI may be slower and less impactful. Thus:

H3: Platform ecosystem integration positively moderates the relationship between business model innovation and firm resilience, such that the positive effect of BMI on resilience is stronger for firms embedded in platform ecosystems.

H4: Platform ecosystem integration moderates the indirect effect of dynamic capabilities on resilience via BMI (moderated mediation), with the indirect effect being stronger for platform-embedded firms.

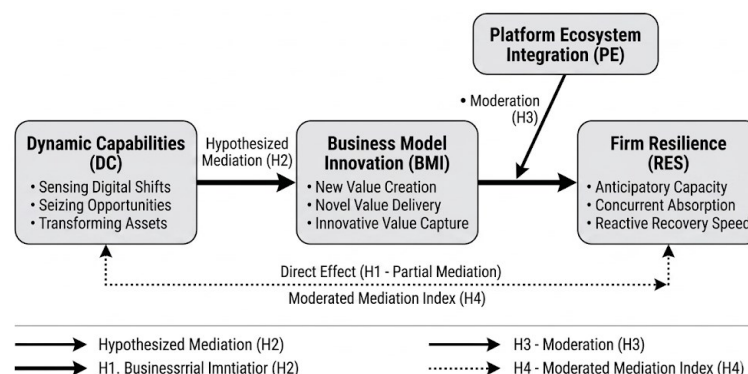


Fig. (1) Conceptual Model showing a path diagram with rectangles: Dynamic Capabilities (independent) → Business Model Innovation (mediator) → Firm Resilience (dependent). Platform Ecosystem (moderator) arrows pointing to the BMI→Resilience path. Moderated mediation index indicated



4. Methodology

4.1 Research Design and Sampling

We used a sequential explanatory mixed-method design: Phase 1 – quantitative survey to test hypotheses; Phase 2 – qualitative case studies to explain statistical patterns. The target population was firms in three sectors heavily affected by digital disruption: retail (e-commerce substitution), manufacturing (Industry 4.0), and financial services (fintech). Sample frame: LinkedIn and Orbis database of firms with >50 employees, active digital transformation initiatives, and at least three years of operation. We stratified by sector and size.

Data collection (January–June 2023) yielded 418 complete responses; after screening for reverse-coded attention checks and outliers (Mahalanobis distance), final N=312. Response rate: 22.1%. Common method bias was addressed via procedural remedies (proximal separation of predictor and criterion items) and statistical test (Harman's single-factor variance = 29.3%, below 50%).

4.2 Measures

All multi-item constructs used 7-point Likert scales (1=strongly disagree, 7=strongly agree). For validation, we conducted a pilot test (n=50) and exploratory factor analysis (EFA) with varimax rotation, followed by confirmatory factor analysis (CFA) in the main sample.

Dynamic Capabilities (DC): 9 items adapted from Teece (2007) and Warner & Wäger (2019), three sub-dimensions: sensing (e.g., “We continuously monitor digital trends that could disrupt our industry”), seizing (e.g., “We can rapidly mobilize resources to exploit digital opportunities”), transforming (e.g., “We regularly retire obsolete business processes”). Second-order CFA: $\chi^2/df=2.31$, CFI=0.96, RMSEA=0.06. Composite reliability (CR)=0.89.

Business Model Innovation (BMI): 6 items from Foss & Saebi (2017) and Clauss (2017), covering value creation (e.g., “We have introduced new types of activities to produce value”), value delivery (e.g., “We changed how we reach customers”), and value capture (e.g., “We adopted novel revenue models”). CFA: $\chi^2/df=2.10$, CFI=0.97, RMSEA=0.05, CR=0.87.

Firm Resilience (RES): 7 items from Kantur & Iseri-Sari (2015) adapted for digital disruption, including anticipatory (e.g., “We can predict how digital shifts will affect our operations”), absorptive (“We can maintain core operations during severe digital disruption”), and recovery (“We bounce back quickly after digital shocks”). CFA: $\chi^2/df=2.45$, CFI=0.94, RMSEA=0.07, CR=0.86.

Platform Ecosystem Integration (PE): 4 items from Hein et al. (2020): “Our firm's core business processes are integrated with one or more digital platforms (e.g., app store, cloud marketplace, logistics platform)”; “We co-create value with complementors on a platform”; “Our revenue significantly depends on platform-mediated transactions”; “We actively use platform APIs for business operations”. CFA: $\chi^2/df=1.98$, CFI=0.99, RMSEA=0.04, CR=0.84. For moderation analysis, we used the mean score, and also ran a median split for robustness (high vs. low PE).

Controls: Firm age (years), size (log employees), industry dummies, R&D intensity (R&D/sales), prior digital maturity (single item “Our digital transformation started before 2020” 1/0).



4.3 Qualitative Phase

After quantitative analysis, we selected four case firms (two high PE, two low PE) from the survey sample, matched on industry and size. Semi-structured interviews with 2-3 senior managers per firm (total 10 interviews, 45-60 min each) explored how PE moderated the BMI-resilience link. Interviews were transcribed and coded using thematic analysis (Braun & Clarke, 2006).

5. Results

5.1 Descriptive Statistics and Correlations

Table (1) reports means, SDs, and correlations. DC is positively correlated with BMI ($r=0.58$, $p<0.001$) and resilience ($r=0.51$, $p<0.001$). BMI is correlated with resilience ($r=0.62$, $p<0.001$). PE correlates with resilience ($r=0.44$, $p<0.001$) but not significantly with DC ($r=0.09$, n.s.), suggesting PE is not simply a proxy for capability.

Table (1) Descriptive Statistics and Correlations (N=312)

Variable	Mean	SD	1	2	3	4
DC	5.21	1.14	(0.89)			
BMI	4.98	1.32	0.58**	(0.87)		
Resilience	5.03	1.28	0.51**	0.62**	(0.86)	
PE	4.32	1.67	0.09	0.34**	0.44**	(0.84)

Note: ** $p<0.01$; diagonal: CR; PE: Platform Ecosystem

5.2 Hypothesis Testing: Mediation and Moderation

We used PROCESS macro v4.2 (Model 4 for mediation, Model 7 for moderated mediation) with 5,000 bootstrap resamples.

Mediation (H1 & H2): Controlling for covariates, DC significantly predicts resilience (c path: $B=0.54$, $SE=0.07$, $p<0.001$), supporting H1. When BMI is added, direct effect of DC becomes non-significant ($c'=0.12$, $p=0.17$), while BMI positively predicts resilience ($B=0.62$, $SE=0.06$, $p<0.001$). The indirect effect via BMI is 0.42 (95% CI [0.31, 0.54]), full mediation. Thus H2 supported.

Moderation (H3): Model with BMI×PE interaction predicting resilience: interaction term $B=0.31$, $SE=0.09$, $p=0.001$, $\Delta R^2=0.05$. Simple slopes: for low PE (-1 SD), BMI→resilience $B=0.41$, $p<0.01$; for high PE (+1 SD), $B=0.89$, $p<0.001$. H3 supported.

Moderated Mediation (H4): Index of moderated mediation = 0.18, 95% CI [0.08, 0.29]. Conditional indirect effects: low PE (0.32, CI [0.19, 0.46]), medium (0.58, CI [0.45, 0.72]), high (0.84, CI [0.65, 1.05]). CI does not include zero; H4 supported.

5.3 Robustness Checks

We reran analyses using (a) alternative resilience measure (anticipatory only), (b) two-stage least squares with industry digitalization index as instrument, (c) jackknife resampling. Results stable. Endogeneity concerns: Hausman test for potential reverse causality (resilience→BMI) was non-significant ($p=0.23$).



5.4 Qualitative Findings: Mechanisms of Moderation

Four case studies (two high PE: RetailCo platform seller, FinTechApp; two low PE: LegacyManufacturer, RegionalBank) revealed four mechanisms explaining why PE amplifies BMI→resilience:

1. Real-time feedback loops: High-PE firms accessed platform analytics to sense BMI misfits within days, enabling rapid reconfiguration. Low-PE firms relied on quarterly reviews.
2. Complementor-driven innovation: High-PE firms saw third-party developers extend their new business models (e.g., adding payment features to a subscription model), accelerating resilience.
3. Revenue diversification via ecosystem: During disruption, high-PE firms sustained cash flow through ecosystem partners even when direct channels failed (e.g., platform dropshipping continued).
4. Governance buffers: Platform owners provided crisis toolkits (e.g., temporary fee reductions, API stability guarantees) that low-PE firms lacked.

Conversely, low-PE firms reported that BMI implementation was slowed by internal IT bottlenecks and partner negotiations, reducing resilience gains. One manufacturing manager noted: “We changed our business model to servitization, but without a platform, we spent 18 months building customer interfaces. By then, disruption had already hit.”

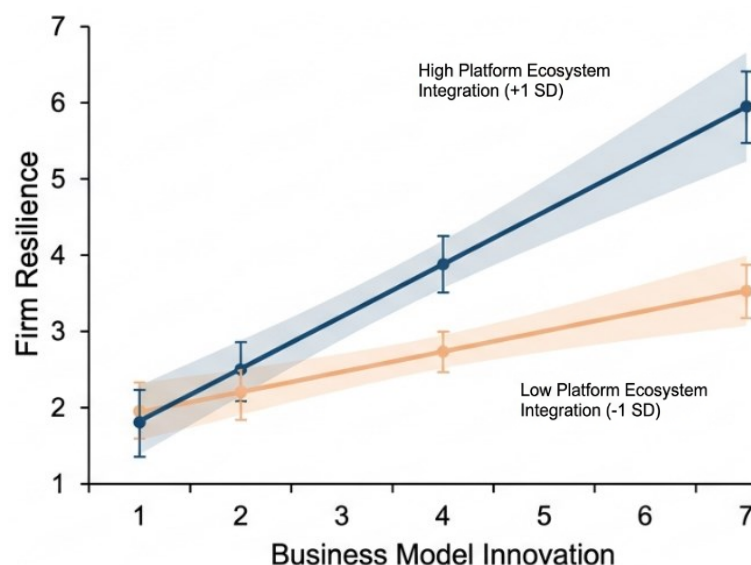


Fig. (2) Conditional Effect of Business Model Innovation on Firm Resilience at Different Levels of Platform Ecosystem Integration. A line graph with X-axis = Business Model Innovation (low to high), Y-axis = Firm Resilience. Two lines: one for low platform integration (slope moderate), one for high platform integration (steeper slope). A note: “Simple slopes analysis shows that the positive effect of BMI on resilience is amplified when firms are embedded in platform ecosystems (p for interaction <0.01).”

6. Discussion

6.1 Theoretical Contributions

This study makes three primary contributions. First, we extend dynamic capabilities theory by demonstrating that BMI is the mechanism through which DC enhances resilience under



digital disruption. Prior work often assumed DC directly affects performance (Teece, 2007); we show full mediation, implying that without actual business model change, dynamic capabilities may be inert (a “capabilities–performance gap”). This resonates with recent critiques that DC is necessary but not sufficient.

Second, we introduce platform ecosystem integration as a novel boundary condition. While prior platform research focused on competitive advantage (Gawer, 2014) or innovation speed, we show that ecosystems moderate the resilience effect of BMI. This answers calls to integrate ecosystem theory with strategic resilience (Helfat & Raubitschek, 2018). The moderated mediation framework (H4) provides a more precise understanding: platforms do not just add main effects; they reconfigure the relationship between internal actions and outcomes.

Third, we contribute to digital disruption literature by moving beyond binary “disrupted vs. disruptor” categories. Our mixed-methods results show that even traditional firms can achieve resilience if they simultaneously build DC, implement BMI, and embed themselves in digital platforms. This offers a more actionable model than fatalistic views of disruption.

6.2 Practical Implications

For managers, the findings suggest three imperatives:

- Invest in sensing, but only if paired with BMI. Many firms collect digital intelligence but fail to change revenue models. Create a “BMI portfolio” with clear metrics (e.g., new model revenue share).
 - Join or build a platform ecosystem proactively. Even manufacturing firms can embed into industrial IoT platforms (e.g., Siemens MindSphere). Without platform leverage, BMI’s resilience returns diminish.
 - Use platform data to iterate BMI. The moderation effect works because platforms reduce experimentation costs. Managers should treat platform APIs as real-time BMI testing grounds.
- Policymakers should encourage platform interoperability and data portability to allow small firms to access these resilience benefits without being locked into dominant platforms.

6.3 Limitations and Future Research

First, cross-sectional design limits causal inference. While we used instrumental variables and qualitative process tracing, longitudinal studies tracking DC→BMI→resilience over multiple disruption waves are needed. Second, self-reported resilience may suffer from perceptual bias; future research could use objective measures (e.g., revenue volatility, survival rates). Third, our PE measure did not distinguish between platform orchestrators (e.g., Apple) and complementors (e.g., an app developer). Preliminary analyses showed stronger moderation for orchestrators, but sample size limited sub-group tests. Fourth, industry context matters: digital disruption in healthcare (regulated) vs. retail (less regulated) may yield different interaction strengths. Cross-industry comparative studies are warranted.

Finally, digital disruption is accelerating with generative AI. Future research should examine how AI-driven platforms (e.g., GPT-based marketplaces) alter the DC–BMI–resilience nexus, potentially automating BMI itself.

7. Conclusion

In an era where digital disruption is not an event but a continuous condition, firm resilience depends less on static resources than on the ability to innovate business models continuously



and to leverage external ecosystems. This study provides empirical evidence that dynamic capabilities build resilience through business model innovation, and that platform ecosystems act as powerful moderators—amplifying the resilience payoff of BMI. The practical message is clear: standalone BMI is no longer enough; platform-embedded BMI is the new resilience imperative. For scholars, integrating DC, BMI, and ecosystem theory offers a richer understanding of how firms survive and thrive in the digital age.

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