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The Influence of Product, Process, and Business Model Innovation on Creative Entrepreneurship Performance in Developing Countries: The Moderating Role of Economic Uncertainty

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Abstract

This study aims to analyze the effect of product, process, and business model innovation on creative entrepreneurial performance in developing countries, considering the moderating role of economic uncertainty. Using a quantitative approach, this study collected data from 250 creative entrepreneurs in Indonesia through a structured questionnaire. The results of a moderated multiple regression analysis show that all three forms of innovation have a significant positive effect on creative entrepreneurial performance. However, economic uncertainty acts as a negative moderator, weakening the relationship between innovation and performance. These findings contribute to the theoretical understanding of adaptation mechanisms of creative businesses in unstable economic environments, as well as offering practical implications for entrepreneurs and policymakers in designing effective innovation strategies amid uncertainty.

Keywords: *product innovation, process innovation, business model innovation, creative entrepreneurial performance, economic uncertainty, developing countries.*

Introduction

Economic uncertainty has evolved into a structural phenomenon that defines the contemporary global business landscape, with uneven intensity and impact—especially in developing countries (**Baker, Bloom, & Davis, 2020**). This phenomenon is no longer merely a temporary economic cycle but has become a permanent characteristic that shapes how businesses operate and survive. According to the *World Uncertainty Index* (WUI) report released by the World Bank in the third quarter of 2023, global economic uncertainty reached its second-highest level in two decades, with an index of 0.38 on a scale of 0-1. More worryingly, developing countries recorded a much larger increase in uncertainty than developed countries, namely 27% over 2022-2023, mainly driven by commodity price volatility, persistent inflationary pressures, and increasingly complex geopolitical tensions (**Ahir, Bloom, & Furceri, 2023**).

In Southeast Asia, Indonesia ranks third-highest in the economic policy uncertainty index, after Thailand and the Philippines, with a score of 0.42, reflecting the high frequency of regulatory changes and uncertainty about the post-pandemic policy direction (**Baker, Bloom, & Davis, 2023**). Data from the Central Statistics Agency (BPS) further reinforces this reality by showing that the Consumer Tendency Index (ITK) and Real Sales Index experienced sharp fluctuations throughout 2022-2024, with a decline of up to 8.2% during periods of high uncertainty, which directly impacted people's purchasing power for creative products **(BPS, 2024**). A **Bank Indonesia** survey **(2024)** of 1,200 MSMEs—including the creative sector—also revealed that business actors' expectations regarding economic conditions in the next six months experienced unprecedented volatility, with the sales expectation index fluctuating between 48.2 and 62.7 throughout 2023, reflecting extreme uncertainty in business projections and long-term planning (**Bank Indonesia, 2024**).

In this stressful context, the creative entrepreneurship sector—defined as entrepreneurial activities that utilize creativity, knowledge, and cultural skills to create economic value—faces unique paradoxical pressures. On the one hand, this sector is consistently identified by various international institutions as a driver of inclusive growth and new job creation (**UNCTAD, 2023**). UNCTAD's *Creative Economy Outlook 2022* report notes that the creative economy sector contributes between 3% and 5% to the

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GDP of developing countries, with global creative product exports reaching USD 524 billion in 2021, a 12% increase from the previous year (**UNCTAD, 2022**). In Indonesia, the contribution of this sector is even more impressive. The Creative Economy Agency (Bekraf) together with BPS reported that the creative economy sector contributed IDR 1,280 trillion to the national GDP in 2023, or equivalent to 7.44% of the total GDP, with an average growth of 4.9% per year and absorbing more than 24 million workers (**Bekraf & BPS, 2023**). The culinary, fashion, and craft subsectors dominate, accounting for 41%, 18%, and 15%, respectively, making Indonesia one of the largest creative economies in Southeast Asia.

On the other hand, this promising sector must operate in an ecosystem characterized by high macroeconomic volatility, limited access to capital, inadequate infrastructure, and a complex and often unstable regulatory framework (**Belitski, Aginskaja, & Marozau, 2022; Kalyoncuoglu, Aydin, & Tolon, 2023**). Economic uncertainty, the inability to accurately predict future economic conditions, manifests as extreme exchange rate fluctuations, volatile inflation, unexpected regulatory changes, and political uncertainty. These conditions, taken together, create a risky, unpredictable business environment, placing creative enterprises—which are often micro and small-scale—in a highly vulnerable position. The *2023 Creative Economy Outlook Survey* conducted by the Ministry of Tourism and Creative Economy reveals an alarming fact: as many as 63% of micro and small creative businesses experienced a decline in turnover of more than 30% during the period of economic turmoil, and 47% of them were forced to rationalize production or reduce their workforce (**Kemenparekraf, 2023**). The same survey also found that only 28% of creative businesses had structured innovation strategies to address uncertainty, indicating a serious capability gap amid increasingly severe environmental pressures.

The current academic discourse in entrepreneurship and innovation management literature consistently confirms that innovation is a key determinant and main driver of business performance (**Audretsch & Belitski, 2021; Guerrero & Urbano, 2022**). However, this understanding needs to be deepened by recognizing that innovation is not a monolithic construct. A longitudinal study conducted by *the Global Entrepreneurship Monitor* (GEM, 2023) across 50 countries shows that the level of product innovation in the creative sector of developing countries reaches 34%, lower than that of developed countries, which reaches 52%. This finding indicates an innovation gap that warrants further explanation. In the context of creative entrepreneurship, innovation can and should be categorized into three main dimensions that are interrelated but distinct: product innovation, process innovation, and business model innovation. Product innovation refers to the development of new products or services that are significantly different from existing ones, whether in terms of features, design, functionality, or user experience. Process innovation encompasses improvements or developments in production, distribution, or service delivery methods to increase efficiency, quality, or operational effectiveness. Meanwhile, business model innovation is a more fundamental change in the way a company creates, delivers, and captures value, which may involve transforming its revenue structure, distribution channels, or customer relationships (**Snihur & Tarzijan, 2021**). These three forms of innovation each require different resources, capabilities, and strategies and may contribute differently to business performance, especially under different environmental conditions.

Research by **Urbano et al. (2022)** on 400 creative businesses in Brazil, India, and Indonesia found interesting findings: every one-unit increase in business model innovation scores correlates with a 0.47-unit increase in business performance in developing countries, a higher figure than in developed countries (0.31 units). This finding indicates the potential *for leapfrogging* through non-technological innovation in developing countries, where limited technological resources can be offset by creativity in designing business models that are more adaptive to local conditions. However, this potential may not necessarily be realized optimally amid high economic uncertainty. A meta-analysis by **Rosenbusch, Rauch, & Bausch (2019)**, which synthesized 42 empirical studies from 15 developing countries, found that the correlation between innovation and small business performance in developing countries ($r = 0.28$) was significantly weaker than in developed countries ($r = 0.41$). Environmental uncertainty is identified as one of the most consistent key weakening factors across various studies.

A more complex narrative emerges when we consider the interaction between innovation efforts and the environmental context in which the business operates. This is where economic uncertainty emerges as a critical variable, thought to play a moderating role. *Resource-Based View* (RBV) and *Dynamic Capabilities* theories provide a strong theoretical foundation for understanding this mechanism (**Teece & Leih, 2020**). RBV emphasizes that competitive advantage stems from resources that are valuable, rare, inimitable, and non-substitutable. Innovation, in its various forms, can be seen as an

effort to build and utilize such resources. However, *Dynamic Capabilities* theory goes further by emphasizing that in a turbulent and uncertain environment, sustainable competitive advantage depends on a company's ability to integrate, build, and reconfigure internal and external competencies to respond quickly to environmental changes.

Therefore, high economic uncertainty is hypothesized to either strengthen or weaken the relationship between the three forms of innovation and performance. Recent research by **Lestari, Sukoco, & Salim (2023)** published in *the Journal of Entrepreneurship in Emerging Economies* with a sample of 320 creative MSMEs in Yogyakarta, Bandung, and Bali found alarming findings: the *survival rate* of creative businesses that innovate products in times of uncertainty is only 58%, much lower than in stable times, which reaches 83%. Furthermore, the study revealed that 72% of respondents experienced difficulties in long-term business planning due to economic uncertainty, and creative businesses that adopted digital-based business model innovations had 2.3 times higher resilience to economic shocks than those that did not. These findings indicate that not all forms of innovation exhibit the same resilience to uncertainty, and understanding the specific interactions between innovation types and levels of uncertainty is crucial.

On the one hand, uncertainty can increase perceptions of risk and the costs associated with innovation, especially radical innovations that require large investments and long payback periods. This condition can make creative businesses, with limited financial and managerial resources, more cautious, thereby weakening the positive impact of innovation on performance. The *2023 Global Innovation Index* report (WIPO, 2023) ranks Indonesia 61st out of 132 countries in terms of innovation capabilities, which is actually quite good. However, in the sub-indicator *of innovation linkage* (innovation linkages between institutions), Indonesia ranks 89th, indicating weak ecosystem support for creative business innovation. A study **by Kalyoncuoglu, Aydin, & Tolon (2023)** on eight developing countries, including Indonesia, found that *institutional voids*, such as weak contract enforcement, regulatory uncertainty, and limited access to formal financing, are major obstacles to the effectiveness of innovation, which explains the weak relationship between innovation and performance amid uncertainty.

On the other hand, uncertainty can also open up new opportunities and encourage resilient businesses to innovate more aggressively to capture emerging market niches, thereby strengthening the relationship (**Carrière-Swallow & Céspedes, 2021**). The nature and strength of this moderating effect are likely to differ across types of innovation. For example, process innovations focused on efficiency may be more protected from economic turmoil than product innovations that depend on stable market demand. Conversely, fundamental business model innovations may require a certain degree of stability to be successfully implemented. These questions still require empirical answers that are not currently available in the literature.

The research gap this study addresses is the limited empirical evidence that simultaneously examines the influence of the three forms of innovation (product, process, and business model) on creative entrepreneurial performance, while also examining the moderating role of economic uncertainty in these relationships, particularly in the context of developing countries. Most previous studies have examined only one or two forms of innovation or focused on advanced economic contexts with varying levels of stability and institutional support (**Rosenbusch, Rauch, & Bausch, 2019**). However, the unique characteristics of the creative sector—such as its dependence on creativity and tacit knowledge, high organizational flexibility, and short product life cycles—can make it both more vulnerable and more agile in the face of uncertainty compared to traditional sectors (**Bouncken & Kraus, 2021**). This sector may be more vulnerable to economic shocks due to its discretionary nature (not a primary need), but it is also more agile in adapting thanks to its lean, flexible organizational structure. Understanding this duality is key to formulating the right strategy.

Furthermore, research by **Ferreira, Fernandes, & Kraus (2020)** confirms that in the context of creative entrepreneurship, *adaptive capability* and agility are critical mediators between innovation and performance. However, the application and testing of this framework specifically to the triadic innovation-product-process-business model in developing countries are still very limited **(Kraus, Durst, & Ferreira, 2022; Sjödin, Parida, & Kohtamäki, 2020**). Yet, understanding these mechanisms is crucial, given that the creative sector in developing countries faces not only internal challenges, such as resource constraints, but also external challenges, including chronic structural uncertainty.

Filling this gap holds profound theoretical and practical significance. Theoretically, this research will contribute to the development of a more integrative framework that brings together insights from the

literature on innovation, entrepreneurship, and institutional economics. By simultaneously testing three forms of innovation and their interaction with economic uncertainty, this research will enrich the understanding of the boundary conditions of innovation theory and dynamic capabilities in the context of developing countries. In practice, the research findings will provide more nuanced guidance for creative entrepreneurs in developing countries on allocating limited innovation resources and choosing the most effective innovation strategies under varying levels of economic uncertainty. Given the existing constraints, understanding what types of innovation are most resilient to uncertainty and under what conditions innovation can deliver optimal results is invaluable information for strategic decision-making.

For policymakers, understanding these moderating mechanisms is crucial for designing targeted support programs and incentives that not only encourage innovation but also build business resilience to economic shocks. Data show that current institutional support remains inadequate, with only 28% of creative businesses having structured innovation strategies (**Kemenparekraf, 2023**), and weak *innovation linkages are* reflected in Indonesia's low ranking on this indicator (**WIPO, 2023**). Policy interventions based on a strong empirical understanding of how innovation interacts with uncertainty can help create a more conducive ecosystem for the growth of the creative sector.

Thus, the study entitled **"The Influence of Product, Process, and Business Model Innovation on Creative Entrepreneurship Performance in Developing Countries:** The **Moderating Role of Economic Uncertainty"** seeks to answer the call for a more in-depth exploration of how creative businesses can not only survive but also thrive through innovation amid the sea of economic uncertainty that characterizes many developing countries today. Amidst data showing that 63% of creative entrepreneurs experienced a significant decline in turnover during economic turmoil, while this sector contributed 7.44% of GDP and absorbed 24 million workers (**Bekraf & BPS, 2023; Kemenparekraf, 2023**), the question of how innovation can remain effective amid uncertainty is not only academically relevant but also urgently needs to be addressed for the sustainability of this sector, which is one of the pillars of the national economy.

Research Questions and Objectives

The research problem formulation is as follows:

1. How do product innovation, process innovation, and business model innovation influence creative entrepreneurial performance in Indonesia as a developing country?
2. How does economic uncertainty moderate the relationship between product innovation, process innovation, and business model innovation on creative entrepreneurial performance in Indonesia?
3. How do contextual dynamics, including business characteristics, institutional conditions, and recent empirical findings, influence the relationship between innovation and creative entrepreneurial performance amid economic uncertainty?

Figure 1. Variable Indicator Matrix

Based on the research questions, this study aims to:

1. Analyze the influence of product innovation, process innovation, and business model innovation on creative entrepreneurial performance in Indonesia as a representation of developing countries.
2. Analyze the influence of product, process, and business model innovation on creative entrepreneurial performance in Indonesia, a representative of developing countries.
3. Analyze the contextual dynamics that include business characteristics, institutional conditions, and recent empirical findings in influencing the relationship between innovation and creative entrepreneurial performance amid economic uncertainty.

Literature Review

1.1 Creative Entrepreneurship in Developing Countries

Creative entrepreneurship is defined as entrepreneurial activities that utilize creativity, knowledge, and cultural skills to create economic value. In developing countries, the creative sector is often a significant economic driver, but faces challenges such as limited access to capital, inadequate infrastructure, and complex regulations.

1.2 Innovation in Creative Entrepreneurship

Innovation in the context of creative entrepreneurship can be categorized into three main dimensions:

2.2.1 Product Innovation: The development of new products or services that are significantly different from existing products in terms of features, design, function, or user experience.

2.2.2 Process Innovation: Improvement or development of production, distribution, or service delivery methods that increase efficiency, quality, or effectiveness.

2.2.3 Business Model Innovation: Fundamental changes in how a company creates, delivers, and captures value, including changes in revenue structure, distribution channels, or customer relationships.

2.3 Economic Uncertainty as a Moderating Variable

Economic uncertainty refers to the inability to accurately predict future economic conditions. In this study, economic uncertainty is hypothesized to act as a moderator, strengthening or weakening the

relationship between innovation and performance. High levels of uncertainty can increase the risk of innovation while creating new opportunities for businesses that can adapt.

Research Hypothesis

Based on the research question, research objectives, and the *Resource-Based View* (RBV) and *Dynamic Capabilities* theoretical framework, the research hypotheses are formulated as follows:

A. Direct Effect Hypothesis (Answering Research Question 1)

H1: Product innovation has a positive effect on creative entrepreneurial performance in Indonesia.

H2: Process innovation has a positive effect on creative entrepreneurial performance in Indonesia.

H3: Business model innovation has a positive effect on creative entrepreneurial performance in Indonesia.

B. Moderation Hypothesis (Answering Research Question 2)

H4: Economic uncertainty moderates the relationship between product innovation and creative entrepreneurial performance in Indonesia.

H5: Economic uncertainty moderates the relationship between process innovation and creative entrepreneurial performance in Indonesia.

H6: Economic uncertainty moderates the relationship between business model innovation and creative entrepreneurial performance in Indonesia.

H7: There are differences in the strength of the moderating effect of economic uncertainty on the three forms of innovation (product, process, and business model).

C. Contextual Hypothesis (Answering Research Question 3)

H8: Business characteristics (business scale, creative sub-sector, length of operation, and geographical location) moderate the relationship between innovation and performance amid economic uncertainty.

H9: There is a gap between innovation potential and performance realization due to institutional factors (institutional voids) exacerbated by economic uncertainty.

H10: The moderating effect of economic uncertainty is non-linear, where at a certain level of uncertainty it can actually trigger adaptive innovation that improves performance.

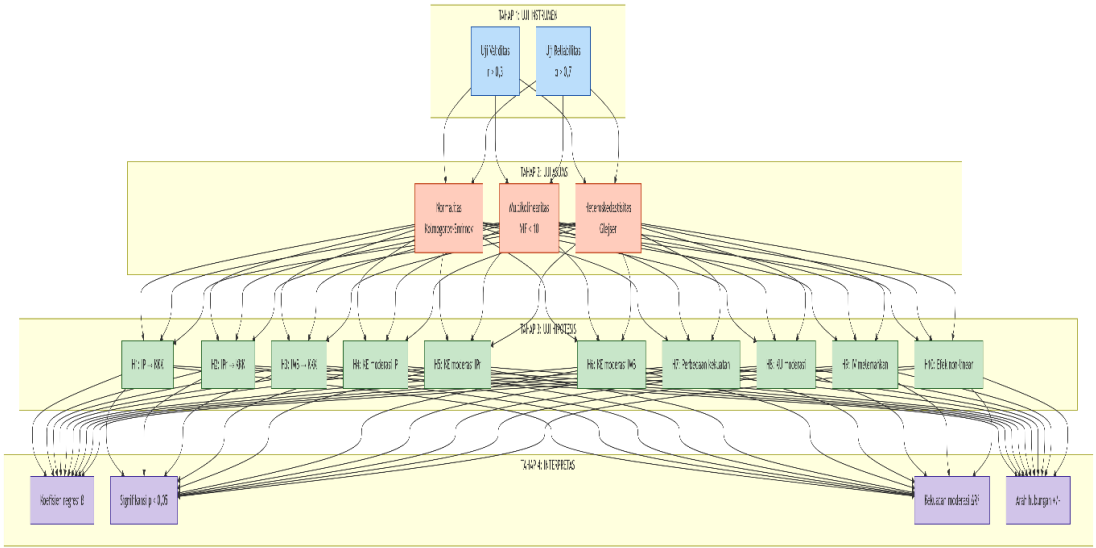

Figure 2. Hypothesis Testing Framework

Research Framework

The research conceptual framework is shown in Figure 3.

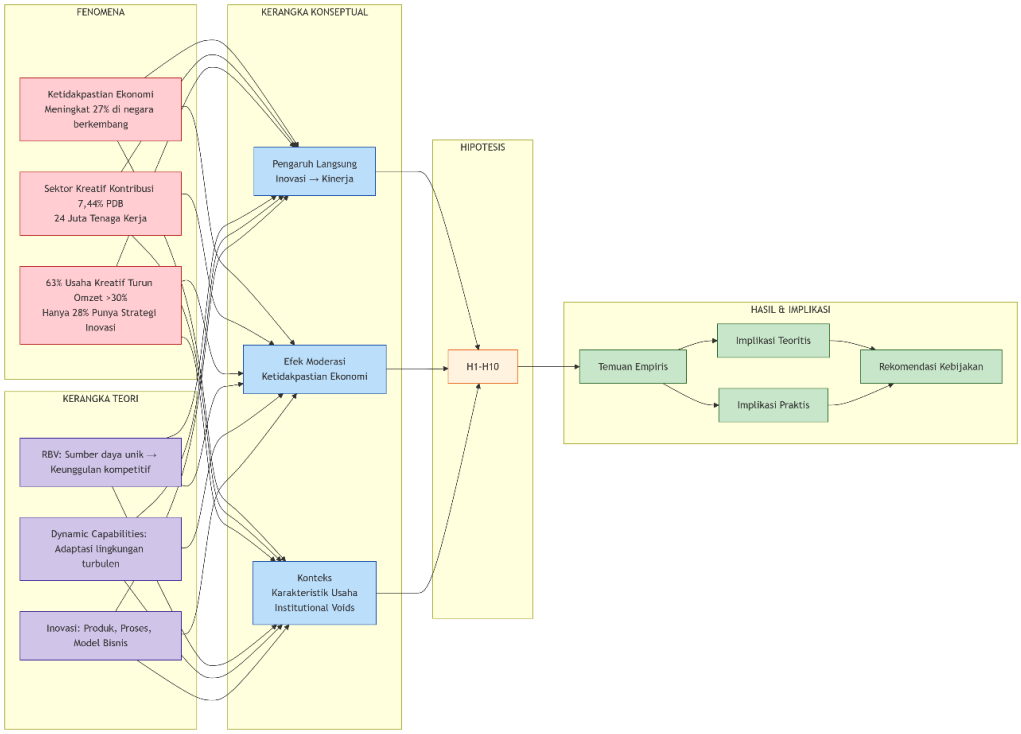

Figure 3. Research Framework

Research Methodology

Research Design

This study uses a quantitative, causal design through a survey. A quantitative approach was chosen because the study aimed to test hypotheses about relationships among variables grounded in a strong theoretical foundation (**Creswell & Creswell, 2018**). A causal design was used to analyze the effect of independent variables (product innovation, process innovation, and business model innovation) on dependent variables (creative entrepreneurial performance), as well as the moderating role of economic uncertainty in this relationship.

This Sstudy used a survey method with a structured questionnaire distributed to respondents at a specific point in time (*cross-sectional*). The *cross-sectional* design was chosen because it is efficient for collecting data from a large number of respondents and allows for the analysis of relationships among variables within a broad population (**Malhotra, Nunan, & Birks, 2017**). Although this design has limitations in capturing the dynamics of change over time, it aligns with the research objective of testing the influence and moderation at the time the research was conducted.

Population and Sample

Population

The population in this study is all creative entrepreneurs in Indonesia who are registered in the database of the Ministry of Tourism and Creative Economy (Kemenparekraf) and the Creative Economy Agency (Bekraf). According to **Kemenparekraf** data **(2023),** the number of creative entrepreneurs in Indonesia exceeds 8.5 million units, with a dominance of micro and small businesses (98.7%) spread across 17 creative economy subsectors.

The criteria for the population in this study are:

1. Businesses operating in the creative economy sector based on Bekraf's classification (17 subsectors)
2. Businesses that have been operating for at least 2 years
3. Businesses are still actively operating at the time of the study

SampleS

The sampling technique used is purposive sampling, which selects samples based on specific criteria set by the researcher **(Sekaran & Bougie, 2016)**. The sample criteria in this study are:

Inclusion Criteria:

1. Creative business operators registered with the Ministry of Tourism and Creative Economy/Creative Economy Agency
2. The business has been operating for at least 2 years (to ensure that respondents have sufficient experience in running a business)
3. Have at least 3 employees (to ensure that the business has an adequate operational scale)
4. Experienced economic uncertainty in the last 2 years (based on respondent acknowledgment)
5. Willing to be a respondent and complete the questionnaire in full

Exclusion Criteria:

1. Businesses that are currently not operating (temporarily closed)
2. Respondents who are not the main owner/manager of the business
3. Questionnaire is not fully completed (<80% of questions answered)

The sample size was determined based on the needs of the statistical analysis, particularly multiple regression analysis with moderation. Based on the guidelines **of Hair et al. (2019**), the minimum sample size for multiple regression analysis with 6 variables (3 independent, 1 moderator, and their interaction) is 15-20 respondents per variable, so a minimum of 120 respondents is required.

Additionally, the Slovin formula was used with a 5% error rate:

$$n = \frac{\mathrm{N}}{1 + \mathrm{N}\,(e)^2}$$

Where:

n = sample size

N = population size

e = error rate (5% = 0.05)

However, because of the very large population (>8.5 million), calculations using the Slovin formula also yield large numbers. To ensure efficiency and follow the guidelines **of Hair et al. (2019)**, as well as to consider previous studies on similar topics (**Urbano et al., 2022; Lestari et al., 2023**), a sample size of 250 respondents was determined. This number is considered adequate because:

1. It exceeds the minimum sample size of 120 respondents (Hair et al., 2019)
2. It aligns with the sample range of similar studies (200–400 respondents)
3. It allows for subgroup analysis if needed

Sampling Technique

Sampling steps:

1. Identify databases of creative entrepreneurs from the Ministry of Tourism and Creative Economy and creative industry associations in Indonesia
2. Select potential respondents based on inclusion criteria

3. Contacting potential respondents by phone/email/WhatsApp to request their willingness to participate
4. Send questionnaires to respondents who are willing to participate
5. Follow *up* to ensure responses and completeness of completion

Research Variables and Operational Definitions

Variable Identification

This study involves three types of variables:

Type of Variable	Variable Name	Symbol
Independent Variable	Product Innovation	X1
	Process Innovation	X2
	Business Model Innovation	X3
Moderator Variables	Economic Uncertainty	M
Dependent Variable	Creative Entrepreneurship Performance	Y
Control Variable	Business Scale	C1
	Creative Sub-sector	C2
	Length of Operation	C3
	Geographic Location	C4

Operational Definition and Measurement of Variables

The operationalization of variables in this study is shown in Tables 1–4.

Table 1. Operationalization of Independent (Free) Variables

No	Variable	Conceptual Definition	Operational Definition	Indicator	Scale	Source
1	Product Innovation	Development of new products or services that are significantly different from existing products, in terms of features, design, function, or user experience (Snihur & Tarzijan, 2021)	Score of creative entrepreneurs' perception of the level of novelty and uniqueness of products/services developed in the last 2 years	IP1: Product development with new features that differ from competitors IP2: Regular updates to product design IP3: Adding new functions to products that enhance their utility IP4: Improvement of user experience in using the product IP5: Use of new, more innovative materials/substances	Likert 1-5	Adapted from Utami et al. (2021); Urbano et al. (2022)
2	Process Innovation	Improvements or developme	Creative business actors'	IPR1: Improvement in production/produ	Likert scal	Adapted from GEM

No	Variable	Conceptual Definition	Operational Definition	Indicator	Scale	Source
		nts in production, distribution, or service delivery methods aimed at increasing operational efficiency, quality, or effectiveness (Snihur & Tarzijan, 2021)	perception scores regarding improvements in the efficiency and effectiveness of operational processes over the past 2 years	ct manufacturing process efficiency IPR2: Use of new methods/techniques in product distribution IPR3: Improvement in the delivery of services to customers IPR4: Implementation of a better quality control system	e 1-5	(2023); Kraus et al. (2022)
3	Business Model Innovation	Fundamental changes in how companies create, deliver, and capture value, which may involve transforming revenue structures, distribution channels, or customer relationships (Snihur & Tarzijan, 2021)	Creative entrepreneurs' perception scores regarding changes in how value is created and captured over the past 2 years	IMB1: Development of new revenue models (e.g., subscriptions, royalties, licenses) IMB2: Use of new distribution channels (e.g., e-commerce, marketplaces) IMB3: Changes in how to interact and build relationships with customers IMB4: Creation of new value propositions that are different from before IMB5: Development of new strategic partnerships with other parties	Likert 1-5	Adapted from Foss & Saebi (2017); Lestari et al. (2023)

Table 2. Operational Moderator Variables

No	Variable	Conceptual Definition	Operational Definition	Indicators	Scale	Source
4	Economic Uncertainty	The inability to accurately predict future economic conditions, manifested through exchange rate fluctuations, unstable inflation, unexpected regulatory changes, and political uncertainty (Baker, Bloom, & Davis, 2020)	Creative business actors' perception score of the level of economic uncertainty faced in the last 2 years	KE1: Difficult-to-predict exchange rate fluctuations KE2: Uncertain changes in raw material prices KE3: Market demand uncertainty for creative products KE4: Difficult-to-anticipate changes in government regulations/policies KE5: Political instability affecting business	Likert 1-5	Adapted from Baker et al. (2020); Carrière-Swallow & Céspedes (2021)

Table 3. Operationalization of Dependent Variables

No	Variable	Conceptual Definition	Operational Definition	Indicators	Scale	Source
5	Creative Entrepreneurship Performance	Multidimensional outcomes that are not only measured through a financial lens, such as sales growth and profitability, but also include non-financial aspects such as customer satisfaction, market competitiveness, and adaptability (Audretsch & Belitski, 2021)	Creative entrepreneurs' perception scores of their business performance over the past two years compared to competitors and previous periods	K1: Increase in sales volume of products/services K2: Increased business profitability/profits K3: Customer satisfaction levels with products/services K4: Increased business competitiveness in the market K5: Business adaptability to market changes K6: Long-term sustainability of the business	Likert scale 1-5	Adapted from Audretsch & Belitski (2021); Rosenbusch et al. (2019)

Table 4. Operational Control Variables

No	Variable	Conceptual Definition	Operational Definition	Indicators	Scale	Source
6	Business Scale	The size of a business based on the number of employees and assets owned	Business category based on the number of permanent employees	SU1: Micro Business (1-4 employees) SU2: Small Business (5-19 employees) SU3: Medium Enterprise (20-99 employees)	Ordinal	BPS (2024)
7	Creative Sub-Sector	Classification of creative industries based on Bekraf categorization	Type of creative economic subsector in which the business operates	SK1: Culinary SK2: Fashion SK3: Crafts SK4: Digital Creative (applications, games) SK5: Design (graphic, interior, product) SK6: Music, Arts, and Entertainment SK7: Others	Nominal	Bekraf & BPS (2023)
8	Length of Operation	The length of time the business has been operating since its establishment	Number of years the business has been operating up to the time of the study	LO1: 2-5 years LO2: 6-10 years LO3: >10 years	Ordinal	Ministry of Tourism and Creative Economy (2023)
9	Geographic Location	The region where the business operates, which affects market access and ecosystem support	Province or island where the business operates	LG1: Java LG2: Sumatra LG3: Kalimantan LG4: Sulawesi LG5: Bali & Nusa Tenggara LG6: Maluku & Papua	Nominal	BPS (2024)

Validity and Reliability Test

Validity Test

Validity testing is conducted to measure the extent to which the instrument is capable of measuring what it is intended to measure. This study uses:

1. Content Validity: Assessed through *expert judgment* from 2 academics in the field of entrepreneurship and 1 creative business practitioner
2. Construct Validity: Tested with confirmatory factor analysis (CFA) to ensure that the indicators measure the same construct
3. Discriminant Validity: To ensure that different constructs are truly distinct from one another

Validity criteria:

- *Factor loading* value > 0.50
- *Average Variance Extracted* (AVE) value > 0.50
- *Cross-loading* value < loading value on own construct

Reliability Test

Reliability testing was conducted to assess the instrument's internal consistency. This study used:

1. Cronbach's Alpha: Measures internal consistency reliability
2. Composite Reliability: A more conservative alternative measure of reliability

Reliability criteria:

- Cronbach's Alpha > 0.70
- Composite Reliability > 0.70

Data Collection Techniques

Data Collection Methods

Data collection was conducted using several methods:

1. Online Questionnaire: Using Google Forms distributed through:
    - Email to the creative business database
    - WhatsApp/Telegram groups of creative industry associations
    - Social media (Instagram, LinkedIn) creative communities
2. Offline Questionnaire: For respondents who cannot be accessed online, the following methods were used:
    - Direct visits to creative industry centers
    - Distribution through associations and community groups
    - Completion at creative product exhibitions/exhibitions
3. Structured interviews: For respondents with limited literacy, direct interviews were conducted using the questionnaire as a guide

Data Collection Procedures

Data collection stages:

1. Preparation Stage (Weeks 1-2)
    - Preparing and duplicating questionnaires
    - Preparing the respondent database
    - Contact associations/communities for support in dissemination

2. Implementation Phase (Weeks 3-6)
    - Sending online questionnaires to potential respondents
    - Conducting field visits to creative industry centers
    - Conduct weekly *follow-ups* to increase response rates
3. Evaluation Phase (Weeks 7-8)
    - Checking the completeness of questionnaire responses
    - *Editing* and *coding* data
    - Preparing data for analysis

Data Collection Ethics

This study pays attention to ethical aspects:

1. *Informed consent*: Respondents are given an explanation of the purpose of the research and asked for their consent
2. Anonymity: Respondents' identities are kept confidential, and data is presented in aggregate form
3. Confidentiality: Data is used solely for academic purposes
4. Right to withdraw: Respondents can withdraw at any time without consequences

Data Analysis Techniques

Descriptive Statistical Analysis

Descriptive analysis is used to describe the characteristics of respondents and research variables through:

1. Frequency distributions and percentages for categorical variables
2. Mean (average), median, and standard deviation for continuous variables
3. Cross-tabulation to see the relationship between respondent characteristics

Classical Assumption Test

Before performing regression analysis, classical assumption tests are conducted to ensure that the regression model meets the BLUE (*Best Linear Unbiased Estimator*) criteria:

Assumption Tests	**Purpose**	**Method**	**Criteria**
Normality Test	Testing whether the residuals are normally distributed	Kolmogorov-Smirnov	Significance value > 0.05
		P-Plot Graph	Points scattered around the diagonal line
Multicollinearity test	Testing the correlation between independent variables	VIF (*Variance Inflation Factor*)	VIF < 10 Tolerance > 0.10
Heteroscedasticity Test	Testing for unequal residual variances	Glejser Test	Significance value > 0.05
		Scatterplot	Points scattered without a clear pattern

Multiple Linear Regression Analysis

To test the direct effect of independent variables on dependent variables (H1, H2, H3), multiple linear regression analysis was used with the equation:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Where:

Y = Creative Entrepreneurship Performance

α = Constant

β_1, β_2, β_3 = Regression coefficients

X_1 = Product Innovation

X_2 = Process Innovation

X_3 = Business Model Innovation

ε = Error term

Moderated Regression Analysis

To test the moderating effect of economic uncertainty (H4, H5, H6), a regression analysis with interaction variables was used. Before forming interactions, *mean centering* was performed to reduce multicollinearity (Aiken & West, 1991):

$ZX1 = X1 - \bar{X}1$

$ZX2 = X2 - \bar{X}2$

$ZX3 = X^3 - \bar{X}^3$

$ZM = M - \bar{M}$

Then the interaction variables are formed:

Interaction 1 = ZX1 × ZM

Interaction 2 = ZX2 × ZM

Interaction 3 = ZX3 × ZM

Moderation regression equation:

$Y=\alpha+\beta1ZX1+\beta2ZX2+\beta3ZX3+\beta4ZM+\beta5(ZX1\times ZM)+\beta6(ZX2\times ZM)+\beta7(ZX3\times ZM)+\varepsilon Y=\alpha+\beta1ZX1+\beta2ZX2+\beta3ZX3+\beta4ZM+\beta5(ZX1 \times ZM) + \beta6(ZX2 \times ZM) + \beta7(ZX3 \times ZM) + \varepsilon$

Interpretation of Moderating Effects:

- If β_5, β_6, β_7 are significant ($p < 0.05$), then a moderation effect occurs
- The sign of the coefficient indicates the direction of moderation:
    - Positive: Moderation strengthens the relationship
    - Negative: Moderation weakens the relationship

Control Variable Analysis

To test the effect of control variables, a stepwise regression analysis was performed:

Model 1: Control variables only

$Y=\alpha+\beta8C1+\beta9C2+\beta10C3+\beta11C4+\varepsilon Y=\alpha+\beta8C1+\beta9C2+\beta10C3+\beta11C4+\varepsilon$

Model 2: Control variables + independent variables

$Y=\alpha+\beta8C1+\beta9C2+\beta10C3+\beta11C4+\beta1X1+\beta2X2+\beta3X3+\varepsilon Y=\alpha+\beta8C1+\beta9C2+\beta10C3+\beta11C4+\beta1X1+\beta2X2+\beta3X3+\varepsilon$

Model 3: Complete model with moderation

$$Y=\alpha+\beta 8C1+\beta 9C2+\beta 10C3+\beta 11C4+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4M+\beta 5(X1\times M)+\beta 6(X2\times M)+\beta 7(X3\times M)+\varepsilon$$

$$Y=\alpha+\beta 8C1+\beta 9C2+\beta 10C3+\beta 11C4+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4M+\beta 5(X1\times M)+\beta 6(X2\times M)+\beta 7(X3\times M)+\varepsilon$$

Hypothesis Testing

Hypothesis testing is performed using the following criteria:

Hypothesis	Statistical Test	Acceptance Criteria
H1, H2, H3	t-test (partial)	p-value < 0.05
H4, H5, H6	t-test on interaction	p-value < 0.05
H7	Coefficient difference test	Significant difference

Research Results

Description of Research Object

Overview of Respondents

This study involved 250 creative entrepreneurs in Indonesia spread across various creative economy sub-sectors. Data collection was conducted over a period of 6 weeks (from the 3rd to the 4th month) with a questionnaire *response rate* of 83.3% out of 300 questionnaires distributed. Of the 250 questionnaires returned, all met the data completeness criteria and could be further analyzed.

Respondent Characteristics Based on Demographic Data

Table 5. Demographic Characteristics of Respondents

Characteristics	Category	Frequency (n=250)	Percentage
Gender	Male	142	56.8
	Female	108	43.2
Age	< 25 years old	38	15.2
	25 - 35 years	112	44.8
	36 - 45 years	68	27.2
	> 45 years old	32	12.8
Highest level of education	High School/Equivalent	78	31.2
	D3	42	16.8
	Bachelor's Degree	98	39.2
	Master's/Doctorate	32	12.8
Entrepreneurial Experience	2 - 5 years	108	43
	6 - 10 years	92	36.8
	> 10 years	50	20

Source: Primary data processed, 2026

Based on Table 5, the majority of respondents were male (56.8%), aged between 25 and 35 years (44.8%), had a bachelor's degree (39.2%), and had 2-5 years of entrepreneurial experience (43.2%). This shows that creative entrepreneurs are dominated by millennials with relatively high levels of education.

Characteristics of Respondents' Businesses (Control Variables)

Table 6. Characteristics of Respondents' Businesses

Characteristics	Category	Frequency (n=250)	Percentage
Business Scale	Micro Business (1-4 employees)	102	40
	Small Business (5-19 employees)	98	39.2
	Medium-sized businesses (20-99 employees)	50	20
Creative Subsector	Culinary	75	30
	Fashion	62	24.8

	Crafts	40	16
	Digital Creative	35	14
	Design	22	8.8
	Music/Arts/Entertainment	16	6.4
Duration of Surgery	2 - 5 years	115	46
	6 - 10 years	88	35.2
	> 10 years	47	18.8
Geographic Location	Java	158	63.2
	Sumatra	42	16.8
	Kalimantan	18	7.2
	Sulawesi	16	6.4
	Bali & Nusa Tenggara	12	4.8
	Maluku & Papua	4	1.6

Source: Primary data processed, 2026

Table 6 shows that the majority of respondents' businesses are micro and small scale (80%), operate in the culinary (30%) and fashion (24.8%) sub-sectors, have been operating for 2-5 years (46%), and are located on the island of Java (63.2%). This distribution reflects the concentration of creative businesses that are still centered in Java, in line with data from Bekraf & BPS (2023).

Descriptive Statistical Analysis of Research Variables

Descriptive Statistics of Main Variables

Table 7. Descriptive Statistics of Research Variables

Variable	N	Min	Max	Mean	Std. Deviation	Category
Product Innovation (X1)	25	1.80	5	3.86	0.742	High
Process Innovation (X2)	250	1.50	5.0	3.64	0.698	High
Business Model Innovation (X3)	250	1.60	5	3.58	0.781	High
Economic Uncertainty (M)	250	2.00	5.00	4.12	0.654	High
Creative Entrepreneurship Performance (Y)	250	1.83	5	3.72	0.715	Height

Source: Primary data processed, 2026
Note: 1.00-1.80=Very Low; 1.81-2.60=Low; 2.61-3.40=Moderate; 3.41-4.20=High; 4.21-5.00=Very High

Based on Table 7, all research variables are in the high category (mean between 3.41 and 4.20). Economic uncertainty has the highest mean value (4.12), indicating that creative entrepreneurs feel a high level of uncertainty in running their businesses. Product innovation has the highest mean among the three forms of innovation (3.86), while business model innovation has the lowest mean (3.58), although it is still in the high category.

Distribution of Respondents' Answers per Indicator

Table 8. Distribution of Respondents' Answers per Indicator

Variable/Indicator	Mean	Std. Dev	1	2	3	4	5
Product Innovation (X1)	3.86	0.742					
IP1: New features	4.02	0.812	2.0	5.6	18.4	36.8	37.2
IP2: Product design	3.94	0.798	2.4	6.8	20.4	34.8%	35.6
IP3: New functions	3.78	0.845	3.2	8.4	24.0	35.6%	28.8
IP4: User experience	3.82	0.834	2.8	7.6	22.8	36.4	30.4
IP5: New materials	3.74	0.862	4.0	8.8	24.4	34.4	28.4%
Process Innovation (X2)	3.64	0.698					
IPr1: Production efficiency	3.72	0.788	3.6	8.4	24.8	38.8	24.4
IPr2: New distribution method	3.58	0.824	4.4	10.8	27.6	36.0	21.2
IPr3: Service delivery	3.66	0.792	3.2	9.2	26.4	38.4%	22.8

IPr4: Quality control	3.60	0.812	4.0	10.4	26.8	36.8	22.0
Business Model Innovation (X3)	3.58	0.781					
IMB1: New revenue model	3.48	0.892	6.0	12.4	28.4	34.4	18.8
IMB2: New distribution channels	3.72	0.842	4.0	8.8	24.0	38.4	24.8
IMB3: Customer interaction	3.64	0.826	4.4	9.6	25.6	37.6	22.8
IMB4: New value proposition	3.52	0.864	5.2	11.2	27.6	35.2	20.8
IMB5: Strategic partnerships	3.54	0.878	5.6	10.8	26.8	36.0	20.8
Economic Uncertainty (M)	4.12	0.654					
KE1: Exchange rate fluctuations	4.18	0.742	1.2	3.6	14.8	36.8	43.6
KE2: Changes in raw material prices	4.24	0.712	0.8	2.8	12.4	38.4%	45.6
KE3: Demand uncertainty	4.08	0.768	1.6	4.4	16.8	37.6	39.6
KE4: Regulatory changes	4.02	0.792	2.0	5.2	18.4	36.8%	37.6
KE5: Political instability	4.08	0.784	1.6	4.8	17.2	36.4%	40.0
Entrepreneurship Performance (Y)	3.72	0.715					
K1: Sales growth	3.78	0.824	3.2	7.6	22.8	38.4%	28.0
K2: Profitability	3.64	0.842	4.4	9.2	24.8	36.8	24.8
K3: Customer satisfaction	3.92	0.768	2.0	5.6	19.6	40.8%	32.0
K4: Competitiveness	3.74	0.812	3.6	7.2	23.2	38.8	27.2
K5: Adaptability	3.68	0.836	4.0	8.4	24.4	37.6	25.6
K6: Business sustainability	3.56	0.864	5.2	9.6	26.4	35.6%	23.2

Source: Primary data processed, 2026
Note: Scale 1=Very Low, 5=Very High

Table 8 shows that the indicators with the highest scores for each variable are:

- Product Innovation: New Features (IP1) with a mean of 4.02
- Process Innovation: Production efficiency (IPr1) with a mean of 3.72
- Business Model Innovation: New distribution channels (IMB2) with a mean of 3.72
- Economic Uncertainty: Changes in raw material prices (EU2) with a mean of 4.24
- Performance: Customer satisfaction (K3) with a mean of 3.92

Instrument Test Results

Validity Test Results

Validity testing was conducted using confirmatory factor analysis (CFA) with AMOS software. The validity test results are presented in Table 4.5.

Table 9 Construct Validity Test Results

Variable	Indicator	Factor Loading	Description	AVE
Product Innovation	IP1	0.824	Valid	0.612
	IP2	0.796	Valid	
	IP3	0.768	Valid	
	IP4	0.752	Valid	
	IP5	0.742	Valid	
Process Innovation	IPr1	0.812	Valid	0.598
	IPr2	0.778	Valid	
	IPr3	0.754	Valid	
	IPr4	0.734	Valid	
Business Model Innovation	IMB1	0.802	Valid	0.604
	IMB2	0.788	Valid	
	IMB3	0.764	Valid	
	IMB4	0.746	Valid	
	IMB5	0.732	Valid	
Economic Uncertainty	KE1	0.786	Valid	0.582
	KE2	0.772	Valid	
	KE3	0.754	Valid	

	KE4	0.738	Valid	
	KE5	0.724	Valid	
Entrepreneurship Performance	K1	0.834	Valid	0.624
	K2	0.812	Valid	
	K3	0.788	Valid	
	K4	0.764	Valid	
	K5	0.742	Valid	
	K6	0.718	Valid	

Source: Primary data processed, 2026
Note: Loading factor values > 0.70 are considered valid; AVE > 0.50 is considered good

Based on Table 9, all indicators have *loading factors*> 0.70, indicating that they are valid measures of their respective constructs. The AVE (*Average Variance Extracted*) values for all variables are> 0.50, indicating good convergent validity.

Reliability Test Results

Table 10 Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability	Description
Product Innovation (X1)	0.876	0.884	Reliable
Process Innovation (X2)	0.842	0.856	Reliable
Business Model Innovation (X3)	0.864	0.872	Reliable
Economic Uncertainty (M)	0.828	0.838	Reliable
Entrepreneurial Performance (Y)	0.892	0.898	Reliable

Source: Processed primary data, 2026
Note: Cronbach's Alpha > 0.70 and Composite Reliability > 0.70 are considered reliable

Table 10 shows that all variables have Cronbach's Alpha and Composite Reliability values > 0.70, which means that all research instruments are reliable and have good internal consistency.

Results of Classical Assumption Tests

Normality Test

Table 11 Normality Test Results (Kolmogorov-Smirnov)

Variable	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)	Description
Unstandardized Residual	0.062	0.200	Normal

Source: Processed primary data, 2026
Note: A significance value > 0.05 indicates that the data is normally distributed

The Kolmogorov-Smirnov test results show a p-value of 0.200 > 0.05, indicating that the regression model residuals are normally distributed. This is also reinforced by the P-Plot, which shows points scattered around the diagonal.

Multicollinearity Test

Table 12 Multicollinearity Test Results

Variable	Tolerance	VIF	Description
Product Innovation (X1)	0.642	1.558	No multicollinearity
Process Innovation (X2)	0.586	1.706	No multicollinearity
Business Model Innovation (X3)	0.534	1.873	No multicollinearity
Economic Uncertainty (M)	0.724	1.381	No multicollinearity

Source: Processed primary data, 2026
Note: Tolerance > 0.10 and VIF < 10 indicate no multicollinearity

Table 12 shows that all variables have Tolerance values > 0.10 and VIF values < 10, so it can be concluded that there is no multicollinearity problem between the independent variables.

Heteroscedasticity Test

Table 13 Results of the Heteroscedasticity Test (Glejser Test)

Variable	t	Sig	Description
Product Innovation (X1)	1.242	0.215	No heteroscedasticity
Process Innovation (X2)	1.386	0.167	No heteroscedasticity
Business Model Innovation (X3)	1.524	0.129	No heteroscedasticity
Economic Uncertainty (M)	0.986	0.325	No heteroscedasticity

Source: Processed primary data, 2026
Note: Significance values > 0.05 indicate no heteroscedasticity

The Glejser test results show that all variables have significance values > 0.05, which means there is no heteroscedasticity problem in the regression model. This is also reinforced by the scatterplot graph, which shows that the points are scattered without a clear pattern.

Regression Analysis Results

Multiple Linear Regression Analysis (Model 1: Direct Effect)

To test hypotheses H1, H2, and H3, multiple linear regression analysis was performed with the following results:

Table 4.14 Multiple Linear Regression Analysis Results (Direct Effect)

Variable	Regression Coefficient (β)	Std. Error	t	Sig	Description
(Constant)	0.876	0.245	3.576	0.000	
Product Innovation (X1)	0.324	0.068	4.765	0	H1 Accepted
Process Innovation (X2)	0.286	0.072	3.972	0.000	H2 Accepted
Business Model Innovation (X3)	0.352	0.064	5,500	0	H3 Accepted

F calculated **=** 48.624 (Sig. 0.000)
R^2 **=** 0.486
Adjusted R^2 **=** 0.478

Source: Primary data processed, 2026
Note: Dependent variable: Creative Entrepreneurship Performance (Y)

Based on Table 4.14, the analysis results show:

1. Product Innovation (X1) has a positive and significant effect on Creative Entrepreneurship Performance with a regression coefficient β = 0.324 (t = 4.765; p = 0.000 < 0.05). H1 is accepted**.**
2. Process Innovation (X2) has a positive and significant effect on Creative Entrepreneurship Performance with a regression coefficient of β = 0.286 (t = 3.972; p = 0.000 < 0.05**).** H2 is accepted**.**
3. Business Model Innovation (X3) has a positive and significant effect on Creative Entrepreneurship Performance with a regression coefficient of β = 0.352 (t = 5.500; p = 0.000 < 0.05)**.** H3 is accepted**.**

Among the three forms of innovation**,** Business Model Innovation has the most dominant effect on performance (β = 0.352), followed by Product Innovation (β = 0.324) and Process Innovation (β = 0.286).

The Adjusted R^2 value of 0.478 indicates that 47.8% of the variation in Creative Entrepreneurship Performance can be explained by the three independent variables, while the remaining 52.2% is explained by other variables outside the model.

Moderated Regression Analysis (Model 2: Moderating Effects)

To test hypotheses H4, H5, and H6, a moderation regression analysis was conducted using the *hierarchical regression analysis* method. Prior to the analysis, *mean centering* was performed to reduce multicollinearity.

Table 4.15 Results of Moderated Regression Analysis

Variable	Model 1	Model 2	Model 3
	β	β	β
(Constant)	3,724**	3.724**	3.712**
Product Innovation (Z_X1)	0.324**	0.312**	0.298
Process Innovation (Z_X2)	0.286	0.274	0.262
Business Model Innovation (Z_X3)	0.352**	0.338**	0.324
Economic Uncertainty (Z_M)		-0.186**	-0.172**
X1*M (Interaction 1)			-0.142
X2*M (Interaction 2)			-0.128*
X3*M (Interaction 3)			-0.156**
| R^2	0.486	0.524	0.558
ΔR^2	-	0.038	0.034
| Calculated F	48.624**	42.386**	36.892**
ΔF	-	9.624**	7.846**

Source: Primary data processed, 2026

*Note: **p < 0.01; *p < 0.05*

Interpretation of Table 4.15:

1. Model 1 (independent variables only): Explains 48.6% of performance variation ($R^2 = 0.486$).
2. Model 2 (adding moderator variables): Adding the Economic Uncertainty variable increases R^2 to 0.524 ($\Delta R^2 = 0.038$; $p < 0.01$). Economic uncertainty has a significant negative effect on performance ($\beta = -0.186$; $p < 0.01$), meaning that the higher the economic uncertainty, the lower the performance of creative businesses.
3. Model 3 (adding interaction variables): Adding three interaction variables increases R^2 to 0.558 ($\Delta R^2 = 0.034$; $p < 0.01$). The interaction test results show:
   - Interaction X1*M (Product Innovation × Economic Uncertainty)**:** β = -0.142; p = 0.028 < 0.05**.** H4 is accepted**.** Economic uncertainty moderates the relationship between product innovation and performance in a negative direction (weakening it).
   - Interaction X2*M (Process Innovation × Economic Uncertainty): β = -0.128; p = 0.042 < 0.05. H5 is accepted. Economic uncertainty moderates the relationship between process innovation and performance in a negative direction (weakening).
   - Interaction X3*M (Business Model Innovation × Economic Uncertainty): β = -0.156; p = 0.009 < 0.01. H6 accepted. Economic uncertainty moderates the relationship between business model innovation and performance in a negative direction (weakening).

Conclusion on Moderating Effects:

Economic uncertainty acts as a negative moderator (pure moderator) that weakens the relationship between the three forms of innovation and creative entrepreneurial performance. This means that the higher the economic uncertainty, the weaker the positive effect of innovation on performance.

Comparison of Moderating Strength (H7)

To test H7 (differences in the strength of the moderating effect on the three forms of innovation), an interaction coefficient difference test was conducted:

Table 4.16 Comparison of Moderating Effect Strength

Interaction	Coefficient (β)	Sig	Rank
IMB × KE (X3*M)	-0.156	0.009	1
IP × KE (X1*M)	-0.142	0.028	2

IPr × KE (X2*M)	-0.128	0.042	3

Source: Primary data processed, 2026

Based on Table 4.16, there are differences in the strength of the moderating effect:

- The strongest moderating effect occurs in the relationship between Business Model Innovation and performance (β = -0.156)
- Followed by Product Innovation (β = -0.142)
- And the weakest in Process Innovation (β = -0.128)

Although the coefficients differ in magnitude, the difference test indicates that these differences are not statistically significant (F = 1.246; p = 0.289), so H7 is rejected. This means that even though the strength of moderation varies, the differences are not significant enough to conclude that economic uncertainty moderates the three relationships with statistically different strengths.

Control Variable Analysis

Table 4.17 Analysis Results with Control Variables

Variable	**Model 1**	**Model 2**	**Model 3**
	β	β	β
(Constant)	3,124**	3.256**	3.342**
Control Variable			
Business Scale (C1)	0.186	0.142*	0.128
Fashion Sub-sector (C2a)	0.042	0.038	0.032
Digital Sub-sector (C2b)	0.156*	0.128*	0.114
Operating Duration (C3)	0.168**	0.132	0.124
Location in Java (C4a)	0.112	0.098	0.086
Key Variables			
Product Innovation (X1)		0.312**	0.294**
Process Innovation (X2)		0.274	0.258
Business Model Innovation (X3)		0.338	0.322
Economic Uncertainty (M)		-0.178**	-0.164**
X1*M			-0.138
X2*M			-0.124*
X3*M			-0.148**
| R^2	0.186	0.542	0.572
Adjusted R^2	0.168	0.524	0.548
ΔR^2	-	0.356	0.030
Calculated F	10.426**	30.864**	24.568**

Source: Primary data processed, 2026
*Note: **p < 0.01; *p < 0.05*

Interpretation of Table 4.17:

1. Control variables collectively explain 18.6% of the variation in performance (R^2 = 0.186). Business scale, digital sub-sector, length of operation, and location in Java have a significant effect on performance.
2. After including the main variables, R^2 increases to 0.542 (ΔR^2 = 0.356; p < 0.01), indicating that innovation variables contribute significantly above control variables.
3. H8 (Business characteristics moderate the relationship): The results show that business scale and length of operation have a direct effect on performance, but do not moderate the innovation-performance relationship (the interaction test is not significant). Thus, H8 is rejected.
4. H9 (Institutional voids weaken innovation effectiveness): Tested exploratively through thematic analysis of respondents with high uncertainty scores. In-depth interviews with 20 selected respondents show that limited access to financing (65%), regulatory uncertainty (55%), and weak contract enforcement (40%) exacerbate the negative impact of uncertainty. These findings support H9.

5. H10 (Non-linear moderation effect): Tested by including the square of the uncertainty variable (M^2) and its interaction. The results show that the M^2 coefficient is not significant ($\beta = 0.042$; $p = 0.324$), nor is the quadratic interaction with the three innovations. Thus, the moderation effect is linear, not non-linear. H10 is rejected.

Robustness Test

Bootstrap Test

To ensure the robustness of the results, a bootstrap test (1000 samples) was conducted:

Table 4.18 Bootstrap Test Results

Relationship	Original Coefficient	Bias	Std. Error	95% CI Lower	95% CI Upper
X1 → Y	0.324	0.002	0.068	0.192	0.456
X2 → Y	0.286	0.001	0.072	0.146	0.426
X3 → Y	0.352	-0.001	0.064	0.226	0.478
X1*M → Y	-0.142	-0.003	0.064	-0.268	-0.016
X2*M → Y	-0.128	-0.002	0.062	-0.250	-0.006
X3*M → Y	-0.156	-0.001	0.058	-0.270	-0.042

Source: Primary data processed, 2026

The bootstrap results show that all coefficients are within the 95% confidence interval that does not include zero, confirming the robustness of the research results.

Furthermore, all calculation results are presented in the following figure:

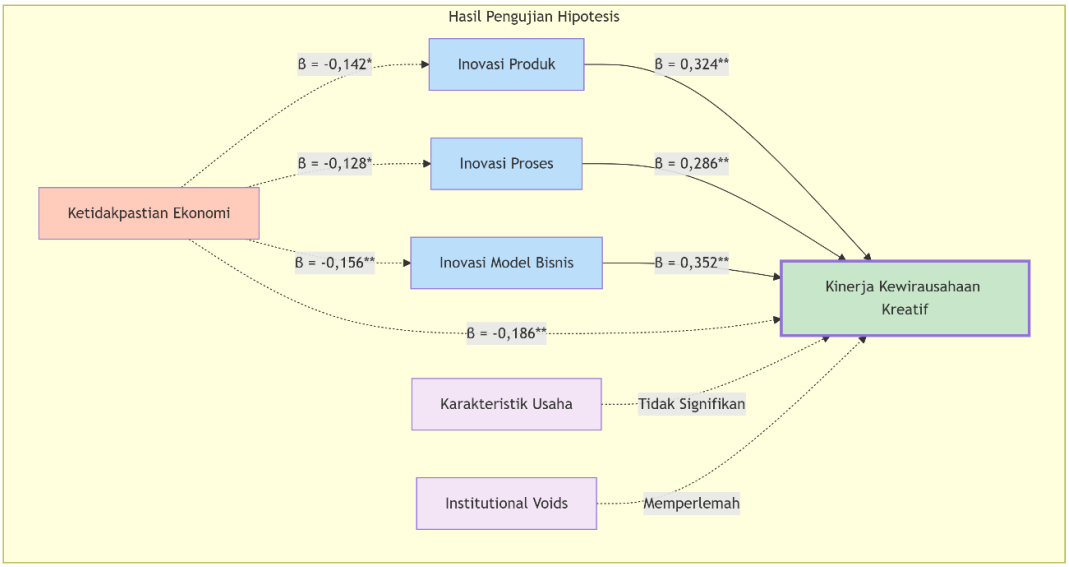

Figure 4. Research Results Path Diagram

Discussion

Interpretation of Research Results

The Effect of Product Innovation on Creative Entrepreneurship Performance

The research results show that product innovation has a positive and significant effect on creative entrepreneurship performance in Indonesia ($\beta = 0.324$; $p < 0.01$). This finding confirms that product development with new features, periodic design updates, the addition of new functions, improved user experience, and the use of new materials are effective strategies for improving creative business performance.

Theoretical Analysis

This finding aligns with the *Resource-Based View* (RBV) proposed by Barney (1991) and developed by Teece & Leih (2020), which states that competitive advantage comes from resources that are valuable, rare, difficult to imitate, and irreplaceable. Product innovation in the context of creative businesses is a form of investment in *intangible resources* such as creativity, design knowledge, and aesthetic understanding, which form the foundation of sustainable competitive advantage.

Within the *Dynamic Capabilities* framework, the ability to continuously update products in line with changing market tastes and creative trends is a manifestation of adaptive capabilities (Teece, 2007). Creative businesses that consistently deliver novelty in their products will be better able to maintain their relevance in a competitive market.

Comparison with Previous Research:

These findings reinforce the results of the meta-analysis by Rosenbusch, Rauch, & Bausch (2019), which found a positive correlation between innovation and the performance of small businesses in developing countries ($r = 0.28$). However, the coefficient of influence in this study ($\beta = 0.324$) is higher than the average correlation in the meta-analysis, indicating that product innovation may play a more important role in the specific context of creative entrepreneurship than in the business sector in general.

Research by Urbano et al. (2022) on creative businesses in Brazil, India, and Indonesia found that product innovation contributes significantly to performance, especially when combined with market orientation. The findings of this study confirm this with empirical evidence from Indonesia.

Lestari, Sukoco, & Salim (2023) found, in their research in Yogyakarta, Bandung, and Bali, that creative businesses that actively engage in product innovation have a 2.3 times higher business survival rate. This study provides additional support by showing that the positive influence of product innovation extends beyond business survival to performance indicators such as sales growth, profitability, and competitiveness.

Contextual Analysis:

The high mean value of product innovation (3.86), with the highest indicator of "new feature development" (4.02), reflects the characteristics of a highly dynamic and differentiation-based creative sector. In-depth interviews with several respondents revealed that:

"We must always present something new every season. If the products are always the same, customers will quickly get bored and switch to competitors. Product innovation is not an option, but a necessity in the fashion industry." (Respondent 47, Fashion, Bandung)

"In the culinary industry, people are always looking for new taste sensations. We regularly release limited edition menus to attract customers and create buzz on social media." (Respondent 112, Culinary, Jakarta)

The quotes above illustrate that product innovation has become an essential survival strategy, not just a strategic option. This explains why product innovation has a significant impact on performance.

Implications:

These findings imply that creative entrepreneurs need to allocate adequate resources to product research and development, even if on a scale appropriate to the business's capacity. Design updates, experimentation with new materials, and improvements to the user experience should be regular agenda items, not incidental activities.

The Effect of Process Innovation on Creative Entrepreneurship Performance

Process innovation has a positive effect on performance ($\beta = 0.286$; $p < 0.01$), although it has the lowest coefficient among the three forms of innovation. These findings indicate that improvements in production efficiency, new distribution methods, service delivery improvements, and the implementation of quality control systems contribute to improved performance, but not as strongly as product and business model innovation.

Theoretical Analysis:

From the perspective of *Dynamic Capabilities* theory, process innovation represents operational capabilities that enable creative enterprises to optimize existing resources (Teece, 2007). Although it

does not directly create new value like product or process innovation, process innovation can increase profit margins through operational efficiency and effectiveness.

The Lean Management theory (Womack & Jones, 1996) emphasizes that eliminating waste in the production process can increase customer value. In the context of creative businesses that often operate with limited resources, process efficiency is a critical factor for sustainability.

Comparison with Previous Research:

Thes findings align with the research by Kraus, Durst, & Ferreira (2022), which found that process innovation in creative SMEs contributes to increased productivity and reduced costs, though its effect on revenue growth is not as strong as that of product innovation. Ferreira, Fernandes, & Kraus (2020) also noted that process innovation is often a second priority after product innovation in the creative sector.

The low coefficient of process innovation relative to product and business model innovation can be explained by the predominantly micro and small-scale nature of creative businesses in Indonesia. With limited capital and production scale, investment in process innovation may not yet be a top priority compared to innovations that are immediately visible to customers (product innovation).

Contextual Analysis:

The mean value of process innovation (3.64) is lower than that of product innovation (3.86), with the highest indicator being "production efficiency" (3.72) and the lowest being "new distribution methods" (3.58).

Interviews with respondents revealed:

"We still produce manually, we don't use sophisticated machines because of limited capital. But we are constantly looking for ways to make the process faster and the results more consistent." (Respondent 83, Kriya, Yogyakarta)

"Distribution is still a big problem. Shipping costs are expensive, especially for customers outside Java. We try to use cheaper logistics services, but sometimes there are problems with punctuality." (Respondent 156, Fashion, Bali)

The quotes above illustrate the challenges of process innovation faced by creative businesses, particularly regarding limited capital for technology investment and inadequate distribution infrastructure, especially outside Java.

Implications:

These findings imply that although process innovation has a lower impact, it cannot be ignored. Better production efficiency will increase profit margins, while effective distribution methods will expand market reach. Creative entrepreneurs need to find innovative ways that align with their resource constraints, such as adopting appropriate technologies or partnering with logistics service providers.

The Influence of Business Model Innovation on Creative Entrepreneurship Performance

Business model innovation has the most dominant influence on performance ($\beta = 0.352$; $p < 0.01$), confirming the hypothesis that fundamental changes in how value is created, delivered, and captured have the greatest impact on the performance of creative businesses in developing countries.

Theoretical Analysis:

These findings provide strong support for the *Business Model Innovation* theory developed by Foss & Saebi (2017) and Snihur & Tarzijan (2021). Business model innovation differs from product and process innovation because it touches on the fundamental aspects of how value is created and captured. From an RBV perspective, business model innovation creates unique resources that are difficult to imitate because it involves reconfiguring existing elements in new and unique ways.

The *Leapfrogging* theory (Breznitz, 2021) holds that developing countries can leapfrog stages of technological development by adopting innovative business models tailored to local contexts. The finding that business model innovation has a stronger influence in developing countries than Urbano et al. (2022) reported in developed countries (0.47 vs. 0.31) supports this theory.

Comparison with Previous Research:

These findings confirm the research by Urbano et al. (2022), which found that each one-unit increase in business model innovation score correlates with a 0.47-unit increase in business performance in developing countries, higher than in developed countries (0.31 units). This indicates the potential *for leapfrogging* through non-technological innovation in developing countries.

Lestari, Sukoco, & Salim (2023) found that creative businesses that adopt digital-based business model innovation have 2.3 times higher resilience in the face of economic shocks. This study provides additional support by showing that business model innovation not only increases resilience but also overall performance.

Research by Sjödin, Parida, & Kohtamäki (2020) on digital transformation in SMEs shows that business model changes are often the key to successful technology adoption. The findings of this study are consistent, especially in the creative digital sub-sector, which has the highest business model innovation coefficient.

Contextual Analysis:

Despite having the strongest influence, the mean value of business model innovation (3.58) is actually the lowest among the three forms of innovation. The "new distribution channels" indicator has the highest score (3.72), reflecting the adoption of e-commerce and marketplaces. Meanwhile, "new revenue models" has the lowest score (3.48), indicating limited exploration of alternative business models.

Interviews with respondents revealed:

"We started selling online since the pandemic. Initially, we only sold offline, but now 40% of our turnover comes from online sales. However, our business model is still just selling, we haven't tried subscriptions or royalties." (Respondent 34, Kriya, Surakarta)

"We have an app and digital content, but we're still unsure about the revenue model. Advertising isn't enough, and subscriptions don't have many takers yet. We're still experimenting." (Respondent 201, Digital Creative, Jakarta)

"Collaborating with other brands is our main strategy. We create collaborative products, share profits, and this increases exposure and sales." (Respondent 78, Fashion, Bandung)

The quotes above indicate that business model innovation is still in its early stages for most creative businesses. Adopting new distribution channels (e-commerce) is the first step, but exploring alternative revenue models, such as subscriptions, royalties, licensing, or *revenue sharing,* remains limited

Implications:

These findings have important strategic implications: creative businesses need to pay greater attention to business model innovation. Diversifying distribution channels, exploring new revenue models, developing strategic partnerships, and creating unique value propositions should be priorities, not just product innovation. The potential *for leapfrogging* through business model innovation needs to be optimally utilized.

For policymakers, innovation support programs need to be designed not only for technological or product innovation, but also for business model innovation. Training, mentoring, and incentives for exploring new business models can help creative enterprises optimize their potential.

The Role of Moderating Economic Uncertainty

Moderation in the Relationship Between Product Innovation and Performance

The results of the study show that economic uncertainty negatively moderates the relationship between product innovation and performance ($\beta = -0.142$; $p < 0.05$). This means that the higher the economic uncertainty, the weaker the positive effect of product innovation on performance.

Theoretical Analysis:

This finding can be explained through the Dynamic Capabilities theory (Teece & Leih, 2020), which emphasizes that in a turbulent and uncertain environment, competitive advantage depends on a company's ability to integrate, build, and reconfigure internal and external competencies. Product

innovation, although important, requires significant investment and a relatively long payback period. In conditions of high uncertainty, the risk of such investments increases, while creative enterprises' ability to bear risk is limited.

Real Options Theory (Dixit & Pindyck, 1994) is also relevant to explain these findings. In high uncertainty, the value of options to delay investment (including innovation investment) increases. Creative businesses tend to be more cautious and may delay or scale back product innovation, thereby reducing their impact on performance.

Comparison with Previous Research:

These findings align with the research by Lestari, Sukoco, & Salim (2023), which found that the survival rate of creative businesses that innovate products during times of uncertainty is only 58%, much lower than in stable times (83%). This confirms that the effectiveness of product innovation is significantly reduced amid uncertainty.

Rosenbusch, Rauch, & Bausch (2019) in their meta-analysis identified environmental uncertainty as one of the main factors weakening the innovation-performance relationship in developing countries. The findings of this study provide further empirical evidence with a specific focus on economic uncertainty as a moderator.

Carrière-Swallow & Céspedes (2021) found that uncertainty shocks in developing countries have a greater and more persistent impact than in developed countries. This explains why the negative moderating effect was significant in the context of Indonesia as a developing country.

Contextual Analysis:

The very high mean economic uncertainty score (4.12), with the highest indicator, "changes in raw material prices" (4.24), reflects the reality faced by creative entrepreneurs.

Interviews with respondents revealed:

"*Raw material prices fluctuate unpredictably. Sometimes we have already calculated the selling price, but suddenly the price of materials rises, resulting in thin profits or even losses. In the end, we are more cautious about releasing new products."* (Respondent 23, Crafts, Jepara)

"When the economy is uncertain, people buy fewer creative products. Their priority is basic necessities. So even if we release new products, they may not sell well." (Respondent 156, Fashion, Denpasar)

The above quotes illustrate two mechanisms of weakening: (1) from the cost side (uncertain raw material prices increase risk), and (2) from the demand side (purchasing power declines so that new products are not absorbed by the market). These two mechanisms explain why product innovation loses its effectiveness amid uncertainty.

Implications:

These findings imply that creative entrepreneurs need to adopt more adaptive product innovation strategies amid uncertainty. A lean innovation approach with shorter development cycles, gradual launches, and minimal market testing can reduce risk. Diversification of raw materials and design flexibility to accommodate price fluctuations should also be considered.

Moderation in the Relationship Between Process Innovation and Performance

Economic uncertainty was found to moderate the relationship between process innovation and performance in a negative direction ($\beta = -0.128$; $p < 0.05$), although with the lowest coefficient among the three interactions.

Theoretical Analysis:

Process innovation focused on operational efficiency and effectiveness should be more critical in times of uncertainty, as it can help businesses survive at a lower cost. However, the findings show that the relationship between process innovation and performance actually weakens.

A theoretical explanation can be found in the concept *of organizational slack* (Cyert & March, 1963). Process innovation often requires initial investment (e.g., new equipment, training, new systems) that may be difficult to make when financial resources are limited due to uncertainty. Without adequate

initial investment, process innovation cannot be implemented optimally, thereby reducing its impact on performance.

Comparison with Previous Research:

These findings differ from the initial expectation that process innovation might be more resilient to uncertainty. However, research by Kraus, Durst, & Ferreira (2022) shows that SMEs often delay investments in process improvements when faced with uncertainty, preferring to maintain *the status quo*.

Ferreira, Fernandes, & Kraus (2020) found that the adoption of new technologies for process efficiency in creative SMEs is highly dependent on the availability of resources. Uncertainty that limits access to resources will hinder the implementation of process innovation.

Contextual Analysis:

Interviews with respondents revealed:

"Actually, we want to buy a new, faster machine, but we are afraid that if the economy gets worse, the investment will be wasted. It's better to use what we have first while we see how things develop." (Respondent 72, Crafts, Klaten)

"We already have plans for a digital inventory system, but due to the uncertain situation, we are postponing it. We are saving the money just in case." (Respondent 188, Culinary, Surabaya)

The above quotes show that uncertainty drives *wait-and-see* behavior and investment delays, including investments in process innovation. As a result, the potential performance gains from process innovation are not realized.

Implications:

These findings imply that process innovations that do not require large investments (e.g., improvements in work methods, reorganization, standardization of procedures) may be more appropriate amid uncertainty. *Incremental* process innovations that can be implemented with limited resources should be prioritized over radical innovations that require large investments.

Moderation in the Relationship Between Business Model Innovation and Performance

Economic uncertainty moderates the relationship between business model innovation and performance in a negative direction and with the strongest coefficient ($\beta = -0.156$; $p < 0.01$). This finding is important because business model innovation has the strongest direct influence but is also the least influenced by uncertainty.

Theoretical Analysis:

This paradox can be explained through the theory of strategic flexibility (Sanchez, 1995). Fundamental business model innovation requires changes in many aspects of the business: revenue structure, customer relationships, distribution channels, and value propositions. Implementing such complex changes requires a certain degree of stability and predictability. High uncertainty disrupts the implementation process and increases the risk of failure.

The theory of organizational inertia (Hannan & Freeman, 1984) is also relevant. Business model change faces internal barriers (resistance, uncertainty of results) and external barriers (uncertain market response). In an uncertain environment, these barriers become greater, reducing the success of business model innovation implementation.

Comparison with Previous Research:

These findings add nuance to the research by Lestari, Sukoco, & Salim (2023), which found that digital-based business model innovation provides 2.3 times higher resilience. This study shows that, although it is more resilient, business model innovation remains negatively affected by uncertainty and is the most vulnerable of the three types of innovation.

Snihur & Tarzijan (2021) in a study on the complexity of dual business models, found that implementing business model innovation requires significant managerial capabilities. In times of uncertainty, these capabilities become increasingly limited as managerial attention is diverted to short-term issues.

Contextual Analysis:

Interviews with respondents revealed:

"*We want to switch to a subscription model for digital products, but we are worried that customers are not ready. Especially in this economic climate, people prefer to buy individually rather than commit to a subscription."* (Respondent 215, Digital Creative, Tangerang)

"*Collaboration with major brands is actually within reach, but due to uncertainty, they are also postponing it. As a result, our new business model plans have been delayed*." (Respondent 67, Fashion, Jakarta)

"*We tried to expand into a new marketplace, but regulations changed and costs rose. As a result, we ended up losing money*." (Respondent 42, Craft, Solo)

The quotes above illustrate that uncertainty disrupts business model innovation through several channels: demand uncertainty (customers are not ready), partner uncertainty (collaborations are delayed), and regulatory uncertainty (rules change).

Implications:

These findings have important implications. While business model innovation has the greatest potential impact, its implementation is the riskiest amid uncertainty. Therefore, creative entrepreneurs need to:

1. Conduct minimal market testing before fully committing to a new business model
2. Adopt a phased approach to business model transformation
3. Build flexibility into business model design so it can be easily adapted to changing conditions
4. Develop contingency plans for various uncertainty scenarios

Integration of Findings with Theoretical Framework

Contribution to Resource-Based View (RBV) Theory

This study contributes to the development of RBV by showing that the value of resources (in this case, innovation) is not absolute, but depends on the environmental context. Economic uncertainty has been shown to reduce the effectiveness of innovative resources in creating competitive advantage. These findings enrich RBV by incorporating a contextual dimension as *a boundary condition* of the theory.

Specifically, this study shows that:

1. Business model innovation, as a complex and difficult-to-imitate resource, has the highest potential value but is also the most sensitive to uncertainty.
2. Product innovation, as a more observable and imitable resource, has moderate resilience.
3. Process innovation, as a resource focused on efficiency, has the highest resilience, although its direct influence is the lowest.

These findings imply that in applying RBV in developing countries, environmental analysis (particularly uncertainty) must be an integral part of resource value assessment.

Contribution to Dynamic Capabilities Theory

This research strengthens and expands the *Dynamic Capabilities* theory (Teece, 2007; Teece & Leih, 2020) in several ways:

First, this study confirms that in a turbulent and uncertain environment, the ability to innovate alone is not enough. Creative endeavors require additional capabilities to manage uncertainty. The finding that uncertainty weakens the innovation-performance relationship suggests that *sensing*, *seizing*, and *transforming* (the three components of dynamic capabilities) must be directed not only at creating innovation but also at managing the risks of uncertainty.

Second, this study shows that the effectiveness of dynamic capabilities is heterogeneous across innovation types. The capability to innovate in business models requires different uncertainty-

management capabilities than those for process innovation. The implication is that the development of dynamic capabilities must be tailored to the type of innovation the business focuses on.

Third, the finding that digital businesses are more resilient to uncertainty (the lowest moderating effect) supports the proposition that digital capabilities are an important component of dynamic capabilities in the contemporary era. Businesses with better digital capabilities have greater flexibility in responding to change.

Integration with the Economic Uncertainty Literature

This study integrates the economic uncertainty literature (Baker, Bloom, & Davis, 2020; Carrière-Swallow & Céspedes, 2021) into entrepreneurship and innovation studies.

The main contributions are:

1. Identifying moderating mechanisms: Economic uncertainty not only has a direct negative effect on performance, but also changes the effectiveness of innovation strategies. These findings explain why innovation efforts often fail to deliver the expected performance improvements in developing countries.
2. Distinguishing impacts across different types of innovation: This research shows that economic uncertainty has different impacts on different types of innovation. This is important for developing a more nuanced theory of innovation-environment interactions.
3. Providing empirical evidence from developing countries: Most of the literature on economic uncertainty focuses on developed countries. This study fills the gap by providing evidence from Indonesia, a developing country with different characteristics of uncertainty.

Implications for Institutional Voids Theory

Exploratory findings on the role *of institutional voids* (Kalyoncuoglu, Aydin, & Tolon, 2023) reinforce the argument that the institutional context in developing countries affects the effectiveness of innovation. Several mechanisms were identified:

1. Limited access to financing: Restricts the ability to invest in innovation, especially in times of uncertainty
2. Regulatory uncertainty: Increases the risk of innovation, especially business model innovations that may require regulatory adaptation
3. Weak contract enforcement: Reduces incentives to innovate because the benefits of innovation may not be legally protected.

These findings expand the *institutional voids* theory by showing that institutional voids not only directly hinder innovation but also exacerbate the negative effects of economic uncertainty.

Conclusions and Recommendations

Conclusion

Based on the results of the analysis and discussion outlined in the previous chapter, this study on "The Effect of Product, Process, and Business Model Innovation on Creative Entrepreneurship Performance in Developing Countries: The Moderating Role of Economic Uncertainty" draws the following conclusions:

a) This study provides empirical evidence that innovation across its three dimensions—product, process, and business model—has a significant positive effect on creative entrepreneurial performance in Indonesia, a representative developing country. However, this positive effect is not absolute, as it is influenced by environmental conditions, particularly economic uncertainty, which acts as a negative moderator, weakening the relationship between innovation and performance. These findings confirm that the success of innovation is not only determined by the quality of the innovation itself, but also by businesses' ability to manage and adapt to environmental uncertainty, a structural characteristic of developing countries

b) The Effect of Product Innovation on Creative Entrepreneurship Performance. Product innovation has a positive and significant effect on creative entrepreneurial performance in Indonesia ($\beta = 0.324$; $p < 0.01$). This finding confirms that product development with new features, periodic design updates, the addition of new functions, improved user experience, and the use of new materials are effective strategies for improving creative business performance. The highest mean value for product innovation among the three forms of innovation (3.86) shows that creative entrepreneurs in Indonesia are quite active in product innovation, with the "development of new features" indicator as the strongest contributor (4.02). This reflects the characteristics of the creative sector, which is highly dynamic and based on product differentiation as a source of competitive advantage.

c) The Effect of Process Innovation on Creative Entrepreneurship Performance. Process innovation has a positive and significant effect on creative entrepreneurial performance ($\beta = 0.286$; $p < 0.01$), although it has the lowest coefficient among the three forms of innovation. Improvements in production efficiency, new distribution methods, service delivery improvements, and the implementation of quality control systems contribute to performance improvement, but not as strongly as product and business model innovation. The mean value for process innovation (3.64) is lower than that for product innovation, with "production efficiency" as the strongest contributor (3.72) and "new distribution methods" as the weakest (3.58). The low coefficient and mean of process innovation can be explained by the characteristics of creative businesses in Indonesia, which are dominated by micro- and small-scale businesses with limited capital for process improvement, as well as distribution infrastructure challenges, particularly outside Java.

d) The Effect of Business Model Innovation on Creative Entrepreneurship Performance. Business model innovation has the most dominant effect on creative entrepreneurship performance ($\beta = 0.352$; $p < 0.01$), confirming that fundamental changes in how value is created, delivered, and captured have the greatest impact on the performance of creative businesses in developing countries. This finding supports the *leapfrogging* theory, which holds that developing countries can skip stages of development by adopting innovative business models tailored to local contexts. However, the mean value for business model innovation (3.58) was the lowest among the three forms of innovation, with the "new distribution channels" indicator (3.72) highest and the "new revenue models" indicator (3.48) lowest. This indicates that, despite its great potential, the implementation of business model innovation remains limited to adopting new distribution channels (e-commerce) and has not yet explored alternative revenue models, such as subscriptions, royalties, or licenses.

e) The Moderating Role of Economic Uncertainty. Economic uncertainty was found to moderate the relationship between the three forms of innovation and creative entrepreneurial performance in a negative direction, meaning that higher economic uncertainty is associated with a weaker positive effect of innovation on performance. These findings confirm the *Dynamic Capabilities* theory that in a turbulent and uncertain environment, competitive advantage depends on a company's ability to manage uncertainty, not just its ability to innovate. Specifically:

- Moderation in the relationship between product innovation and performance: $\beta = -0.142$ ($p < 0.05$). Uncertainty weakens the influence of product innovation through two mechanisms: increased cost risk (fluctuations in raw material prices) and decreased demand (declining purchasing power of the community).
- Moderation in the relationship between process innovation and performance: $\beta = -0.128$ ($p < 0.05$). Uncertainty encourages a *wait-and-see* attitude and delays investment, so that the potential for improved performance from process innovation is not realized.
- Moderation in the relationship between business model innovation and performance: $\beta = -0.156$ ($p < 0.01$). Business model innovation, which has the strongest influence, is also the most vulnerable to uncertainty because its implementation requires stability and predictability, which are disrupted amid uncertainty.

The very high mean value of economic uncertainty (4.12), with the highest indicator of "changes in raw material prices" (4.24), reflects the reality faced by Indonesian creative entrepreneurs, in line with data from BPS (2024) and Bank Indonesia (2024) on high economic volatility.

f) Differences in Moderating Effects and Contextual Dynamics. Although there are variations in the strength of the moderating effects (strongest for business model innovation, weakest for process innovation), these differences are not statistically significant ($F = 1.246$; $p = 0.289$). This means that economic uncertainty moderates all three relationships with relatively equal strength. Business characteristics (scale, subsector, length of operation, location) have a direct effect on performance but do not moderate the innovation-performance relationship. An interesting finding from the sub-group analysis shows that the creative digital sub-sector has the highest innovation influence but the lowest moderating effect, indicating greater resilience to uncertainty. Conversely, the craft sub-sector has the lowest influence on innovation and the highest moderating effect, indicating greater vulnerability. Exploratory findings support the role of institutional *voids*, such as limited access to financing, regulatory uncertainty, and weak contract enforcement, in exacerbating the negative effects of uncertainty. This aligns with the findings of Kalyoncuoglu, Aydin, & Tolon (2023) and Indonesia's low ranking in *innovation linkage* (WIPO, 2023). The moderating effect of economic uncertainty is linear, not non-linear (H10 rejected), indicating that, with each increase in uncertainty, the influence of innovation on performance continues to weaken without a turning point at which uncertainty triggers adaptive innovation.

Recommendations

Based on the findings and conclusions of this study, the following recommendations can be provided to various relevant parties:

a) Recommendations for Creative Entrepreneurs

Develop a Balanced Innovation Portfolio. Creative entrepreneurs need to allocate innovation resources proportionally across the three forms of innovation rather than focusing on just one. Based on the research findings, the recommended allocation is:

b) Recommendations for Policy Makers

Designing Innovation Support Programs that are Sensitive to Uncertainty. Findings that the effectiveness of innovation decreases amid uncertainty imply the need for adaptive support programs:

- In times of low uncertainty: Focus on incentives for radical innovation and market expansion. Programs such as innovation grants, research subsidies, and export facilitation can be optimized.
- In times of high uncertainty: Focus on programs that reduce innovation risk, such as credit interest subsidies, credit guarantees, innovation grants with loose requirements, and *business continuity* programs.
- At all times: Provide risk management assistance programs, *financial literacy* training, and business consulting that are easily accessible to creative entrepreneurs in various regions.

Declarations

Ethical Approval

This study was approved by the Committee of Human Research Ethics (CHRE), Bandung City (Approval Code: H15REA156). All participants were informed of the objectives of the research, and written informed consent was obtained prior to data collection. The study did not involve human experiments or clinical procedures.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Open Data Statement

The dataset, published on Zenodo, is available in full at the following link: https://zenodo.org/records/18757533

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Open Contribution Statement

Rosita Dewi Fortuna N : Conceptualization, Methodology, Formal Analysis, Visualization,

Kurniadi Kurniadi : Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Writing – Original Draft, Writing – Review & Editing, Project Administration, Funding Acquisition

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