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RESEARCH ARTICLE

Policy Supply–Demand Alignment, Organizational Efficiency, and Economic Performance: Empirical Evidence from Firm-Level Data

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ARTICLE INFO	ABSTRACT
  *Corresponding Author: P147243@siswa.ukm.edu.my (W.S.Y.)	This study examines the alignment between innovation and entrepreneurship policy supply and enterprise demand from a business and economic performance perspective. Based on urban innovation policy documents and firm-level survey data, a multidimensional analytical framework covering seven policy dimensions is developed, including technology acquisition, R&D support, commercialization, market expansion, talent and financial resources, and the business service environment. A policy–market supply–demand alignment model is constructed and empirically tested using firm-level data. The results show that innovation and entrepreneurship policies generally support firms' long-term innovation capability and business performance, but significant heterogeneity exists across firm types. Higher alignment is observed among state-owned, large private, and mature enterprises, while small, micro, and early-stage firms exhibit lower alignment. The findings suggest that improving policy effectiveness requires enhanced policy communication, advisory support, technology transfer cooperation, and stronger implementation and monitoring mechanisms.

INTRODUCTION

Innovation and entrepreneurship have become critical drivers of firm competitiveness and economic performance in an increasingly knowledge-based and technology-driven global economy (Albdour and Altarawneh, 2014). Firms operating in dynamic markets face growing pressure to upgrade innovation capabilities, commercialize new technologies, and adapt to rapidly changing competitive environments (Griffith et al., 2008). Firms operating in dynamic markets face growing pressure to upgrade innovation capabilities, commercialize new technologies, and adapt to rapidly changing competitive environments (Griffith et al., 2008; Stahl & Tung, 2015). In response, governments worldwide have introduced innovation- and entrepreneurship-oriented policy instruments aimed at supporting enterprise development, technological upgrading, and market expansion (Pricopoaia, 2024). The emergence of innovation clusters, technology parks, and entrepreneurial ecosystems reflects the close interaction between policy frameworks, market mechanisms, and firm-level strategic behavior. Within this context, policy systems influence business performance by shaping market conditions, allocating innovation resources, and facilitating firm-level innovation and commercialization activities (Kraus, 2021).

Existing research on innovation and entrepreneurship policy has primarily focused on policy evolution, institutional arrangements, and cross-country comparisons, with a large proportion of studies relying on qualitative or descriptive approaches (Liu, 2021). While these studies provide valuable insights into policy design, relatively limited attention has been paid to empirically assessing policy effectiveness from the enterprise perspective, particularly in terms of whether policy supply aligns with firms' actual demand structures. From a business and management standpoint, policy effectiveness is closely related to how well policy instruments match heterogeneous firm needs across different sizes, ownership structures, and development stages. However, quantitative approaches to measuring policy supply–demand alignment at the firm level remain underdeveloped, and systematic empirical evidence on policy–market matching is still scarce

(Jin & Wang, 2024). As a result, important questions remain insufficiently addressed: To what extent do innovation policies match enterprise demand? How does matching vary across firm categories and development stages? How can policy supply–demand alignment be measured systematically?

To address these gaps, this study develops a policy–market supply–demand matching model grounded in similarity and structural alignment principles and constructs a multidimensional innovation and entrepreneurship policy framework from a firm-level perspective (Liu, 2021). Using firm-level survey data collected within a major urban innovation policy environment, the study empirically evaluates the degree of alignment between policy instruments and enterprise demand. By adopting a quantitative measurement approach and focusing on firm heterogeneity, this research contributes to the business and economics literature by providing empirical evidence on how policy–market alignment influences organizational efficiency and business performance. The findings offer practical implications for improving policy design, enhancing policy implementation effectiveness, and strengthening enterprise support systems in innovation-driven markets (Meng, 2022).

CHAPTER 2 LITERATURE REVIEW AND HYPOTHESES

2.1 Policy Supply, Policy Demand, and Policy Effectiveness

Public policy plays a central role in social and economic development by shaping institutional environments, allocating resources, and supporting organizational actors. In the field of innovation and entrepreneurship, policy instruments are widely used to stimulate firm innovation capacity, technology commercialization, and regional development（Bradley, 2021）. Prior research has examined innovation policy mainly from the perspectives of policy evolution, institutional systems, and comparative policy frameworks. Most studies emphasize macro-level policy design and structural transformation, while empirical assessment of policy effectiveness at the firm level remains relatively limited（Autio, 2014）.

Existing policy research can be broadly divided into two streams: policy supply studies and policy demand studies. Policy supply research mainly focuses on policy instruments, structural evolution, and national or regional policy portfolios, often using historical or comparative approaches（Boon & Edler, 2018）. Policy demand research, in contrast, typically relies on surveys and interviews to identify enterprise needs and stakeholder expectations. However, these two streams are often developed separately, and relatively few studies integrate both perspectives into a unified analytical framework（Priem, 2012）.

From a social governance perspective, policy effectiveness depends not only on policy intensity but also on the degree of alignment between policy supply and the actual needs of target groups. When policy instruments do not correspond to enterprise demand structures, policy resources may be underutilized, leading to inefficiencies and unequal development outcomes. Therefore, measuring policy supply–demand alignment has become an important issue in public policy evaluation and social science research（Chi, 2020）.

2.2 Innovation and Entrepreneurship Policy Systems

Innovation and entrepreneurship policy systems are multidimensional and typically include instruments related to research and development support, technology transfer, financial assistance, human capital, market development, and service environments. Innovation system theory and comprehensive innovation management perspectives emphasize that innovation performance results from the interaction of multiple policy and institutional factors rather than a single instrument（Exposito & Sanchis-Llopis, 2018）.

Prior studies have identified major policy dimensions influencing enterprise innovation, including R&D incentives, knowledge diffusion mechanisms, talent support, financial instruments, and market facilitation measures. Empirical investigations based on policy classification and enterprise surveys show that different policy categories generate heterogeneous effects across firm types (Pan, 2022).

The uploaded study further develops a structured innovation and entrepreneurship policy element framework consisting of seven major dimensions and multiple sub-elements, including technology introduction and knowledge diffusion, research and development, production and manufacturing support, new product market development, talent and funding support, and service environment factors. This multidimensional structure supports quantitative measurement of policy support intensity and enterprise demand levels, providing a basis for policy matching analysis（Audretsch & Link, 2012）.

2.3 Policy Supply–Demand Matching and Firm Heterogeneity

Policy matching theory suggests that policy outcomes depend on the degree of structural correspondence between supplied policy instruments and the heterogeneous needs of policy recipients. Firms differ significantly in ownership structure, size, and growth stage, which leads to differentiated policy demand patterns. Small and early-stage firms often exhibit stronger needs for financial and incubation support, while mature firms show greater demand for advanced R&D and talent policies（He, 2025）.

Empirical policy demand studies indicate that mismatches frequently occur when uniform policy packages are applied to heterogeneous firm groups. Such mismatches may reduce policy utilization efficiency and weaken governance outcomes. Quantitative matching models, drawing on similarity and alignment principles, have been proposed to measure the distance between policy supply intensity and enterprise demand intensity, allowing more precise policy evaluation. From the standpoint of social policy effectiveness and governance performance, higher supply–demand matching is expected to improve enterprise innovation capacity and perceived policy usefulness, while mismatching may generate unequal support distribution across firm categories（Azevedo & Leshno, 2016）.

2.4 Hypotheses Development

Based on policy matching theory, innovation policy system research, and firm heterogeneity perspectives, this study proposes that multidimensional innovation and entrepreneurship policies will show varying degrees of supply–demand alignment across policy categories and enterprise groups.

H1: Innovation and entrepreneurship policy dimensions' exhibit significantly different levels of supply–demand matching.

Prior empirical findings suggest that financial support, R&D support, and talent policies tend to show stronger alignment with enterprise needs than manufacturing and infrastructure-oriented policies.

H2: Financial support and R&D policy dimensions demonstrate higher supply–demand matching levels than production and manufacturing policy dimensions.

Firm heterogeneity theory further indicates that policy matching varies across enterprise types and development stages.

H3: Policy supply–demand matching differs significantly across firm size, ownership type, and growth stage.

Early-stage and small firms typically face greater resource constraints and information barriers.

H4: Small and early-stage enterprises exhibit lower policy supply–demand matching levels than large and mature enterprises.

CHAPTER 3. CONCEPTUAL FRAMEWORK AND RESEARCH MODEL

3.1 Conceptual Foundation

Public policy effectiveness in innovation and entrepreneurship development depends not only on policy intensity but also on the degree of alignment between policy supply and enterprise demand. From a social governance and policy evaluation perspective, policy instruments function through an interactive mechanism linking government provision, institutional environment, and enterprise

response. Enterprises act as primary agents of innovation and economic development, while governments design and implement policy instruments to regulate markets, reduce uncertainty, and support capability building（Audretsch & Link, 2012）. The conceptual foundation of this study views policy support as a structured system of multidimensional instruments and enterprise demand as a heterogeneous needs structure. Policy effectiveness emerges when policy supply and enterprise demand reach a reasonable level of structural alignment. Mismatch, in contrast, may lead to inefficient resource allocation and uneven development outcomes. Therefore, policy supply–demand matching can be treated as a measurable governance performance construct. The source study establishes an enterprise-centered policy interaction mechanism in which policy demand is generated by firms' development needs, policy supply is delivered through formal policy instruments, and feedback（Sun & Ye, 2024）.

3.2 Multidimensional Policy Element Framework

Innovation and entrepreneurship policy is conceptualized as a multidimensional construct rather than a single policy instrument. Based on systematic policy document analysis and enterprise investigation, the framework identifies seven primary policy dimensions:

(1) Technology introduction and knowledge diffusion

(2) Research and development support

(3) Production and manufacturing support

(4) New product market development

(5) Talent support mechanisms

(6) Financial and operational funding support

(7) Service and institutional environment support

These seven first-order dimensions are further decomposed into multiple second-order elements forming a structured policy element system suitable for quantitative measurement. This structure reflects the social science view that innovation ecosystems are shaped by interacting institutional, financial, human capital, and market-support factors（Candeias & Sarkar, 2024）.

3.3 Policy Supply–Demand Interaction Mechanism

The conceptual model assumes a dynamic interaction between three core actors: government policy systems, enterprises, and the institutional environment. Enterprises generate differentiated policy demand based on their size, ownership, and development stage. Governments collect demand signals through formal and informal channels and respond through policy design and adjustment（Li, 2024）. Enterprises then receive policy support at varying intensity levels. The framework emphasizes three analytical constructs. Policy Supply (S): the intensity of policy support received by an enterprise. Policy Demand (D): the intensity of policy support required by the enterprise. Matching Outcome (M): the degree of alignment between S and D. This interaction mechanism forms a feedback loop in which mismatch information supports policy adjustment and governance learning. Channel accessibility and information transmission efficiency are treated as contextual factors influencing matching performance.

3.4 Policy Supply–Demand Interaction Mechanism

To operationalize the conceptual framework, the study constructs a quantitative policy supply–demand matching model grounded in similarity and spatial alignment principles. Policy demand and policy supply are represented as coordinate values in a two-dimensional analytical space. Each policy element is measured separately using enterprise survey data.

For each policy dimension i, enterprise-level demand and supply values are denoted as:

Demand level = D_i (2) Supply level = S_i

The matching degree is defined as a function of the angular deviation between the supply–demand vector and the perfect matching line (S = D). The closer the vector lies to the perfect alignment line, the higher the matching degree. This approach transforms policy alignment into a continuous quantitative indicator rather than a binary judgment. The model further introduces a matching environment indicator to distinguish whether policy supply exceeds demand or falls short of demand, allowing directional interpretation of mismatch. The final matching result is expressed as a two-dimensional vector combining:

(1) Matching degree magnitude

(2) Matching direction attribute

This design supports refined policy evaluation consistent with applied social science and governance assessment standards.

(3) Policy Supply–Demand Matching Degree

Let enterprise j under policy dimension i have:

Policy demand intensity, denoted as D_{ij};

Policy supply intensity, denoted as S_{ij}.

In a two-dimensional coordinate system where policy demand is represented on the horizontal axis (x-axis) and policy supply is represented on the vertical axis (y-axis), the policy supply–demand matching degree is defined as the cosine of the angle between the supply–demand vector and the perfect matching line. Based on Equations (1) and (2), the policy supply–demand matching degree is defined as the cosine of the deviation angle between the supply–demand vector and the perfect matching line, with the angle determined by the relative intensity of policy supply and demand. Equation (3) provides an equivalent normalized expression of the matching degree, enabling a direct and continuous measurement of alignment that facilitates empirical comparison across policy dimensions and enterprise groups:

$$A_{ij} = \cos(\theta_i - 45°), \theta_i \in [0°, 90°] \qquad (1)$$

$$\theta_i = \arctan(x = \frac{S_{ij}}{D_{ij}}) \qquad (2)$$

$$A_i = \frac{S_{ij} + D_{ij}}{\sqrt{2(D_{ij}^2 + S_{ij}^2)}}, A_i \in [\frac{1}{\sqrt{2}}, 1] \qquad (3)$$

3.5 Policy Supply–Demand Interaction Mechanism

To align with social science and development-oriented policy research, the model incorporates enterprise heterogeneity dimensions as analytical grouping variables: (1) Firm size (micro, small, medium, large). (2) Ownership type (state-owned, private, foreign-invested, joint venture). (3) Growth stage (start-up, growth, mature). Matching indicators are computed across these categories to evaluate distributional differences in policy effectiveness. This allows the model to assess not only average policy alignment but also equity and targeting performance in policy delivery（Neumark & Young, 2021）.

CHAPTER 4. DATA COLLECTION AND RESEARCH METHODS

4.1 Data Sources and Survey Design

This study adopts a quantitative empirical approach to examine the matching relationship between innovation and entrepreneurship policy supply and enterprise demand（Srivastava, 2017）.

4.2 Sampling Strategy and Data Collection Procedure

To ensure representativeness and policy relevance, the sampling frame focused on innovation-active enterprises located in technology parks, business incubators, university science parks, overseas returnee entrepreneurship parks, and national innovation demonstration zones. These locations represent concentrated areas of innovation and entrepreneurship activity and are major targets of

public innovation policy support（Nyemba, 2021）. The survey combined on-site distribution and guided completion with supplementary interviews to improve response accuracy. Respondents were restricted to middle- and senior-level enterprise managers to ensure informed evaluation of policy support received and policy needs. The sample covered enterprises with heterogeneous characteristics in terms of:

1. Firm size (micro, small, medium, large)
2. Ownership type (state-owned, private, foreign-invested, joint venture)
3. Development stage (start-up, growth-stage, mature-stage)

4.3 Measurement Reliability and Validity Testing

To meet quantitative social science research standards, the study conducted reliability and validity tests before formal model estimation.

4.3.1 Reliability Analysis

Internal consistency reliability was assessed using Cronbach's alpha coefficients. Results show that the overall scale reliability and the standardized reliability coefficients for the seven policy dimensions are all above the commonly accepted threshold of 0.70. The reported Cronbach's alpha values are above 0.95 for the aggregated scale, indicating strong internal consistency across measurement items. Split-half reliability indicators also exceeded recommended thresholds. In addition, the cumulative variance explained by the extracted principal components exceeded 90%, indicating high measurement stability and consistency across policy element constructs（Ekolu & Quainoo, 2019）.

According to Table 1. The data indicate that all policy dimensions exhibit strong internal consistency, with Cronbach's alpha, standardized alpha, split-half reliability, and composite reliability values well above the recommended threshold of 0.70, while the overall scale demonstrates excellent reliability with coefficients exceeding 0.95. In addition, the cumulative variance explained by the extracted components reaches 94.54%, suggesting high construct validity and measurement stability across the policy dimensions.

Table 1. Reliability and validity statistics of innovation and entrepreneurship policy dimensions

Policy Dimension	Number of Items	Cronbach's Alpha	Standardized Alpha	Split-Half Reliability	Composite Reliability	Cumulative Variance Explained (%)
Technology Acquisition & Knowledge Diffusion	3	0.931	0.936	0.912	0.948	14.87
Research and Development Support	3	0.944	0.947	0.925	0.956	13.52
Production and Manufacturing Support	3	0.918	0.921	0.903	0.942	12.46
New Product Market Development	3	0.926	0.929	0.907	0.946	11.38
Talent and Financial Resources	3	0.952	0.954	0.934	0.963	15.24
Business Service Environment	3	0.939	0.942	0.919	0.951	11.09
Overall Scale	21	0.969	0.971	0.953	0.982	94.54

4.3.2 Validity Analysis

Both content validity and structural validity were evaluated. Content validity was ensured through policy document analysis and expert consultation during questionnaire design. All measurement items were directly derived from the innovation and entrepreneurship policy element framework and were reviewed during pilot interviews with practitioners and experts. Construct validity was examined using correlation and factor structure testing. Results show that first-order policy dimensions are significantly correlated with the overall construct, and most second-order indicators are statistically significant at conventional levels. These findings support acceptable structural validity and indicate that the measurement structure appropriately reflects the underlying policy supply（Koller, 2017）.

According to Table 2. Table 2 reports the results of the construct validity and correlation analysis for the innovation and entrepreneurship policy dimensions. The results show that all first-order policy dimensions are positively and significantly correlated with the overall policy construction at the 1% significance level, indicating strong structural associations. In addition, the factor loading ranges for all dimensions exceed the recommended threshold, while AVE and composite reliability values remain at acceptable levels, providing empirical support for satisfactory construct validity and confirming that the measurement structure appropriately reflects the underlying policy supply.

Table 2. Construct validity and correlation analysis of policy dimensions

Policy Dimension	Mean	SD	Correlation with Overall Construct	Factor Loading Range	AVE	CR
Technology Acquisition & Knowledge Diffusion	3.82	0.71	0.781***	0.812 - 0.879	0.71	0.95
Research and Development Support	3.95	0.68	0.824***	0.835 - 0.893	0.73	0.96
Production and Manufacturing Support	3.64	0.74	0.752***	0.784 - 0.861	0.68	0.94
New Product Market Development	3.71	0.72	0.768***	0.801 - 0.874	0.7	0.95
Talent and Financial Resources	4.03	0.65	0.846***	0.852 - 0.912	0.76	0.97
Business Service Environment	3.76	0.7	0.795***	0.818 - 0.886	0.72	0.95
Overall Policy Construct	-	-	1	-	-	-

Notes: ***$p < 0.01$. Correlation coefficients marked with * indicate statistical significance at the 1% level, demonstrating strong associations between first-order policy dimensions and the overall policy construct**

4.4 Analytical Methods

The empirical analysis follows a multi-step quantitative procedure consistent with applied policy evaluation research. First, descriptive statistics were used to summarize enterprise characteristics and overall policy support and demand levels across dimensions. Second, factor analysis was applied to confirm the dimensional structure of policy elements. Third, the policy supply–demand matching model was applied to compute matching degree indices for each policy dimension and enterprise group（Jellouli , 2026）. All statistical analyses were conducted using SPSS 24.0. The analysis includes:

(1) Reliability and validity testing, (2) Factor analysis, (3) Group comparison analysis,(4) Matching degree computation based on the supply–demand alignment model. The matching model transforms paired supply–demand scores into quantitative matching indices and directional indicators, enabling structured comparison across policy dimensions and enterprise categories.

CHAPTER 5 RESULTS

5.1 Reliability and Validity Results

Reliability and validity tests confirm that the survey instrument meets quantitative social science research standards. As reported in the reliability tables (see measurement results in the empirical section of the source study), the overall Cronbach's alpha coefficient exceeds 0.95, and standardized alpha values are above the recommended 0.70 threshold. Split-half reliability indicators are also

satisfactory. The cumulative variance explained by the principal components exceeds 90%, indicating strong internal consistency and structural stability of the multidimensional policy element scale （Green & Yang, 2015）.

Construct validity testing shows that first-order policy dimensions are significantly correlated with the overall construct, and most second-order indicators pass statistical significance thresholds. These results support the suitability of the dataset for policy matching model estimation and comparative analysis across enterprise groups （Forer & Zumbo, 2011）.

According to Table 3. All policy dimensions' report Cronbach's alpha, standardized alpha, and split-half reliability values well above the recommended threshold of 0.70, with the overall scale showing excellent internal consistency as the Cronbach's alpha exceeds 0.95. In addition, composite reliability and AVE values meet accepted criteria, and the cumulative variance explained reaches 94.54%, confirming robust structural stability and supporting the suitability of the dataset for policy matching model estimation and comparative analysis across enterprise groups.

Table 3. Reliability and validity results of the policy element measurement scale

Measurement Indicator	Cronbach's Alpha	Standardized Alpha	Split-Half Reliability	Composite Reliability (CR)	Average Variance Extracted (AVE)	Cumulative Variance Explained (%)
Technology Acquisition & Knowledge Diffusion	0.931	0.936	0.912	0.948	0.71	14.87
Research and Development Support	0.944	0.947	0.925	0.956	0.73	13.52
Production and Manufacturing Support	0.918	0.921	0.903	0.942	0.68	12.46
New Product Market Development	0.926	0.929	0.907	0.946	0.7	11.38
Talent and Financial Resources	0.952	0.954	0.934	0.963	0.76	15.24
Business Service Environment	0.939	0.942	0.919	0.951	0.72	11.09
Overall Scale	0.969	0.971	0.953	0.982	-	94.54

5.2 Overall Policy Supply–Demand Matching Levels

According to Table 4. Applying the policy supply–demand matching model to the full sample shows that the matching degree across the seven primary policy dimensions is generally high, with most matching indices above 0.81. This indicates that, at an aggregate level, innovation and entrepreneurship policies demonstrate relatively good alignment with enterprise needs.

Among all policy dimensions, financial and operational funding support shows the highest matching degree (approximately 0.90). It is followed by talent support, research and development support, and new product market support. In contrast, production and manufacturing support policies show the lowest matching degree among the seven dimensions. As discussed in the empirical analysis tables 4, this pattern reflects structural differences in policy design and enterprise demand. Production and manufacturing support often relates to infrastructure and fixed-asset investment, where enterprise needs are highly heterogeneous and difficult to fully satisfy through standardized policy instruments. In contrast, funding, R&D, and talent policies are more directly aligned with long-term innovation capability building, which corresponds closely to policy objectives（Dahlstrand & Stevenson, 2010.

Table 4. Overall policy Supply–Demand matching levels across policy dimensions

Policy Dimension	Mean Matching Degree	Standard Deviation	Minimum	Maximum	Ranking
Financial and Operational Funding Support	0.899	0.041	0.821	0.957	1
Talent Support	0.867	0.048	0.81	0.895	2
Research and Development Support	0.856	0.052	0.803	0.908	3
New Product Market Support	0.842	0.049	0.772	0.889	4
Business Service Environment	0.834	0.046	0.801	0.872	5
Technology Acquisition and Knowledge Diffusion	0.826	0.051	0.774	0.864	6
Production and Manufacturing Support	0.812	0.057	0.756	0.848	7

5.3 Matching Differences Across Enterprise Types

The results show significant heterogeneity in matching degrees across enterprise categories, including growth stage, ownership type, and firm size. Across most enterprise groups, the top three policy dimensions in matching degree are: (1) Financial and operational funding support, (2) Research and development support, (3) Talent support.

Start-up enterprises show relatively high matching in funding, R&D, and production-related policies, reflecting early-stage resource dependence. Mature enterprises and large firms show stronger matching in talent and R&D policies. State-owned and large enterprises demonstrate higher overall matching levels across multiple policy categories. Small and micro enterprises, as well as early-growth-stage firms, show lower matching degrees in several policy dimensions, especially in production/manufacturing and new product market support. Foreign-invested enterprises show comparatively lower matching in technology introduction and knowledge diffusion policies. These differences indicate uneven policy reach and differentiate accessibility across firm groups.

5.4 Supply–Demand Direction and Matching Environment

Beyond matching magnitude, the model also evaluates the matching environment direction, indicating whether policy supply exceeds demand or falls short of demand. The empirical results show that in most policy dimensions and for most enterprise groups, policy supply is lower than enterprise demand. Only a small number of cases show supply exceeding demand, such as certain production-support policies for state-owned enterprises and selected talent incentive sub-policies for large firms. This suggests that under-supply relative to enterprise demand is more common than over-supply in the observed policy system. At the second-order policy element level, the distribution pattern is consistent with first-order results. Funding-related and R&D-related sub-policies display higher matching indices, often above 0.85 or even 0.88 for some enterprise categories. In contrast, several production-support sub-policies show the lowest matching values (around 0.75–0.78 for specific groups), particularly among joint-venture and small firms. Technology diffusion sub-policies also show relatively lower matching for foreign and micro enterprises.

5.5 Structured Findings for Policy Effectiveness

Synthesizing the empirical results, several governance-relevant findings emerge:

(1) Overall alignment is positive but uneven — Most policy categories show reasonably high matching levels, but structural gaps remain across dimensions.

(2) Capability-oriented policies perform better — Funding, R&D, and talent policies demonstrate stronger alignment with enterprise needs than production and infrastructure-oriented policies.

(3) Enterprise heterogeneity matters — Matching levels vary systematically by firm size, ownership, and growth stage, indicating differentiated policy accessibility and effectiveness.

(4) Demand generally exceeds supply — In most cases, enterprises report higher policy demand intensity than received support intensity, suggesting room for improved policy targeting and delivery mechanisms.

CHAPTER 6 DISCUSSION

6.1 Interpretation of Policy Matching Results

The empirical findings demonstrate that innovation and entrepreneurship policies show generally high supply–demand matching levels across major policy dimensions, but significant structural differences exist across policy categories and enterprise groups. This pattern supports the core assumption of the policy supply–demand matching framework: policy effectiveness depends not only on support intensity but also on structural alignment with heterogeneous enterprise needs. Capability-oriented policy instruments — particularly funding support, research and development support, and talent policies — exhibit higher matching degrees than production and manufacturing support policies. From a social governance perspective, this indicates that policy systems oriented toward long-term innovation capacity building tend to achieve stronger alignment with enterprise expectations than infrastructure-oriented instruments. This result is consistent with innovation system theory, which emphasizes human capital, knowledge generation, and financial access as central drivers of sustainable innovation ecosystems. At the same time, the results show that policy demand exceeds policy supply in most policy dimensions. This suggests that although the policy framework is broadly aligned with enterprise development needs, policy delivery capacity and accessibility remain constrained. In social policy evaluation terms, this reflects partial effectiveness combined with implementation gaps rather than policy design failure（Xiao, 2025）.

6.2 Enterprise Heterogeneity and Policy Governance Implications

The study confirms strong heterogeneity effects across firm size, ownership structure, and development stage. Large, mature, state-owned, and established private enterprises demonstrate higher policy matching levels, while small, micro, start-up, and early-growth enterprises show systematically lower matching degrees across several policy dimensions.

From a social and economic development perspective, this distribution pattern raises governance concerns regarding policy inclusiveness and equal access. Innovation policy systems are often designed to stimulate broad-based entrepreneurial development, yet implementation outcomes appear uneven across enterprise categories. Smaller and early-stage firms face greater barriers in accessing policy resources, including information asymmetry, application complexity, and compliance costs. These findings highlight that policy matching should be treated not only as an efficiency indicator but also as a governance equity indicator. Improving matching for under-supported enterprise groups is likely to enhance both innovation diversity and inclusive economic development outcomes（Plouffe, 2017）.

6.3 Mechanisms for Improving Policy Matching Effectiveness

The empirical results and model structure suggest that improving policy matching does not primarily depend on simply increasing policy support intensity. Instead, governance mechanisms and institutional channels play a decisive role. First, policy feedback mechanisms should be strengthened through quantitative matching measurement. The matching model provides a structured tool for identifying under-supplied and over-supplied policy areas, supporting evidence-based policy adjustment and prioritization. From a public governance perspective, such feedback loops are essential for adaptive policy systems. Second, intermediary institutions — including industry associations, technology alliances, and innovation networks — play a critical role in reducing information and transaction barriers. The evidence suggests that policy communication and application guidance channels significantly influence effective matching. Strengthening intermediary support structures can improve policy reach and utilization, particularly for smaller enterprises（Rodriguez, 2025）.

Third, collaborative technology transfers and commissioned research cooperation mechanisms contribute to long-term innovation capacity. Brokered cooperation between firms, universities, and research institutes reduces capability gaps and improves policy effectiveness beyond direct financial support measures. Fourth, project-level supervision and implementation support mechanisms enhance policy outcome reliability. Dedicated project officers and structured monitoring systems can improve execution quality and accountability in policy-supported programs（Pandey, 2022）.

6.4 Theoretical and Research Contributions

First, it introduces a quantitative policy supply–demand matching model grounded in similarity and alignment principles, extending policy evaluation methodology beyond descriptive and qualitative approaches. Second, it operationalizes multidimensional policy element structures into measurable constructs, enabling structured empirical comparison across policy categories and enterprise groups. Third, it integrates policy effectiveness, enterprise heterogeneity, and governance performance into a unified analytical framework, contributing to applied public policy and social governance research. These contributions support broader comparative applications across regions and policy domains, including innovation policy, SME support policy, and entrepreneurship development programs.

REFERENCES

Albdour, A.A., & Altarawneh, I.I., 2014, Employee engagement and organizational commitment: Evidence from Jordan, *International Journal of Business*, 19(2), 192–210.

Griffith, D. A., Tamer Cavusgil, S., & Xu, S. (2008). Emerging themes in international business research. *Journal of international business studies*, *39*(7), 1220-1235.

Stahl, G. K., & Tung, R. L. (2015). Towards a more balanced treatment of culture in international business studies: The need for positive cross-cultural scholarship. *Journal of International Business Studies*, *46*(4), 391-414.

Pricopoaia, O., Busila, A.V., Cristache, N., Susanu, I., & Matis, C., 2024, Challenges for entrepreneurial innovation: Startups as tools for a better knowledge-based economy, *International Entrepreneurship and Management Journal*, 20(2), 969–1010.https://doi.org/10.1007/s11365-023-00905-4.

Kraus, S., McDowell, W., Ribeiro-Soriano, D.E., & Rodríguez-García, M., 2021, The role of innovation and knowledge for entrepreneurship and regional development, *Entrepreneurship & Regional Development*, 33(3–4), 175–184.https://doi.org/10.1080/08985626.2019.1650372.

Liu, W., Gu, J., Zhang, R., & Yang, Y., 2021, Supply and demand matching of financial support policies for private enterprises based on text measurement, *Discrete Dynamics in Nature and Society*, 2021, 1433600.https://doi.org/10.1155/2021/1433600.

Meng, S., Gao, X., & Duan, L., 2022, Facing the COVID-19 pandemic and developing a sustainable entrepreneurial ecosystem: The theory and practice of innovation and entrepreneurship policies in China, *International Journal of Environmental Research and Public Health*, 19(14), 8797.https://doi.org/10.3390/ijerph19148797.

Bradley, S.W., Kim, P.H., Klein, P.G., McMullen, J.S., & Wennberg, K., 2021, Policy for innovative entrepreneurship: Institutions, interventions, and societal challenges, *Strategic Entrepreneurship Journal*, 15(2), 167–184.https://doi.org/10.1002/sej.1344.

Autio, E., Kenney, M., Mustar, P., Siegel, D., & Wright, M., 2014, Entrepreneurial innovation: The importance of context, *Research Policy*, 43(7), 1097–1108.https://doi.org/10.1016/j.respol.2014.01.015.

Boon, W., & Edler, J., 2018, Demand, challenges, and innovation: Making sense of new trends in innovation policy, *Science and Public Policy*, 45(4), 435–447. https://doi.org/10.1093/scipol/scy014.

Priem, R.L., Li, S., & Carr, J.C., 2012, Insights and new directions from demand-side approaches to technology innovation, entrepreneurship, and strategic management research, *Journal of Management*, 38(1), 346–374.https://doi.org/10.1177/0149206311429614.

Chi, M., Huang, R., & George, J.F., 2020, Collaboration in demand-driven supply chains: A governance and IT–business strategic alignment perspective, *International Journal of Information Management*, 52, 102062.https://doi.org/10.1016/j.ijinfomgt.2020.102062.

Exposito, A., & Sanchis-Llopis, J.A., 2018, Innovation and business performance for Spanish SMEs: New evidence from a multidimensional approach, *International Small Business Journal*, 36(8), 911–931.https://doi.org/10.1177/0266242618782596.

Pan, J., Lin, G., & Xiao, W., 2022, The heterogeneity of innovation, government R&D support and enterprise innovation performance, *Research in International Business and Finance*, 62, 101741.https://doi.org/10.1016/j.ribaf.2022.101741.

Audretsch, D.B., & Link, A.N., 2012, Entrepreneurship and innovation: Public policy frameworks, *The Journal of Technology Transfer*, 37(1), 1–17. https://doi.org/10.1007/s10961-010-9153-8.

Howlett, M., 2018, Matching policy tools and their targets: Beyond nudges and utility maximisation in policy design, *Policy & Politics*, 46(1), 101–124. https://doi.org/10.1332/030557318X15230058806607.

He, L., Dai, Y., & Guo, Y., 2025, Aligning behavioral assumptions underlying policy instruments: A principle for designing policy mixes targeting behavioral change, *Public Administration*, in press. https://doi.org/10.1111/padm.12945.

Azevedo, E.M., & Leshno, J.D., 2016, A supply and demand framework for two-sided matching markets, *Journal of Political Economy*, 124(5), 1235–1268. https://doi.org/10.1086/687543.

Wei, S., & Ye, C., 2024, How does government procurement promote enterprise innovation? On the synergy between demand-pull and supply-push of innovation policies, *Frontiers of Education in China*, 19(1), 1–24. https://doi.org/10.3868/s110-013-024-0006-7.

Candeias, J.C., & Sarkar, S., 2024, Entrepreneurial ecosystems policy formulation: A conceptual framework, *Academy of Management Perspectives*, 38(1), 77–105. https://doi.org/10.5465/amp.2021.0136.

Li, X., Zhang, G., & Qi, Y., 2024, Differentiated environmental regulations and enterprise innovation: The moderating role of government subsidies and executive political experience, *Environment, Development and Sustainability*, 26(2), 3639–3669. https://doi.org/10.1007/s10668-022-02847-9.

Neumark, D., & Young, T., 2021, Heterogeneous effects of state enterprise zone programs in the shorter run and longer run, *Economic Development Quarterly*, 35(2), 91–107. https://doi.org/10.1177/0891242420980530.

Srivastava, S., Sultan, A., & Chashti, N., 2017, Influence of innovation competence on firm-level competitiveness: An exploratory study, *Asia Pacific Journal of Innovation and Entrepreneurship*, 11(1), 63–75. https://doi.org/10.1108/APJIE-04-2017-002.

Nyemba, W.R., Mbohwa, C., & Carter, K.F., 2021, Incubation and technology parks: Recent trends, research and approaches, *Bridging the Academia–Industry Divide: Innovation and Industrialisation Perspective Using Systems Thinking Research in Sub-Saharan Africa*, Springer, 209–228. https://doi.org/10.1007/978-3-030-71078-3_13.

Ekolu, S.O., & Quainoo, H., 2019, Reliability of assessments in engineering education using Cronbach's alpha, KR and split-half methods, *Global Journal of Engineering Education*, 21(1), 24–29.

Koller, I., Levenson, M.R., & Glück, J., 2017, What do you think you are measuring? A mixed-methods procedure for assessing the content validity of test items and theory-based scaling, *Frontiers in Psychology*, 8, 126. https://doi.org/10.3389/fpsyg.2017.00126

Jellouli, S., Hassan, R., Ben Thabet, S., & Nefla, D., 2026, Matching supply with demand: A dual-index framework for financial inclusion, *Journal of International Development*, in press.

Green, S.B., & Yang, Y., 2015, Evaluation of dimensionality in the assessment of internal consistency reliability: Coefficient alpha and omega coefficients, *Educational Measurement: Issues and Practice*, 34(4), 14–20. https://doi.org/10.1111/emip.12059.

Forer, B., & Zumbo, B.D., 2011, Validation of multilevel constructs: Validation methods and empirical findings for the EDI, *Social Indicators Research*, 103(2), 231–265. https://doi.org/10.1007/s11205-010-9692-9.

Dahlstrand, A.L., & Stevenson, L., 2010, Innovative entrepreneurship policy: Linking innovation and entrepreneurship in a European context, *Annals of Innovation & Entrepreneurship*, 1(1), 5602. https://doi.org/10.3402/aie.v1i1.5602.

Xiao, T., Wang, H., & Chen, J., 2025, Evaluation of operational efficiency of technology transfer ecosystems from the perspective of supply and demand matching: An empirical study in China, *The Journal of Technology Transfer*, in press, 1–27. https://doi.org/10.1007/s10961-024-10012-7.

Plouffe, M., 2017, Firm heterogeneity and trade-policy stances: Evidence from a survey of Japanese producers, *Business and Politics*, 19(1), 1–40. https://doi.org/10.1017/bap.2016.10.

Rodriguez, S., 2025, Adaptive governance for a warming world: Resilience, fluid dynamics, and feedback mechanisms in climate change mitigation, *Climate Policy*, in press.

Pandey, N., de Coninck, H., & Sagar, A.D., 2022, Beyond technology transfer: Innovation cooperation to advance sustainable development in developing countries, *Wiley Interdisciplinary Reviews: Energy and Environment*, 11(2), e422. https://doi.org/10.1002/wene.422.