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Do Talent Policy Instruments Matter Equally for Innovation in SSI SMEs? Firm-Year Evidence from Chongqing, China

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Abstract
Talent policy is often studied as a single intervention, even though local policy packages combine financial, settlement, and development measures. This study asks whether those instruments are associated with firm-level innovation in the same way. It distinguishes monetary incentive policies (MIP), life-service support policies (LSP), and development-support policies (DSP) for policy-recognised Specialized, Sophisticated, and Innovative Small and Medium-sized Enterprises (SSI SMEs) in Chongqing, China. The panel contains 370 firms and 1,843 valid firm-year observations for 2022–2026. Innovation is measured by annual invention patent applications, while the policy variables capture standardised coverage of applicable local support content. A two-way fixed-effects model jointly estimates MIP, LSP, and DSP using CR2 cluster-robust standard errors and Satterthwaite-adjusted degrees of freedom. All three policy dimensions are positively associated with patent applications in the primary model. Within the common content-coverage metric, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients, whereas the LSP–DSP difference is not statistically significant. Robustness checks show comparatively stable results for MIP and DSP; the positive LSP coefficient is more sensitive in statistical significance. The findings suggest that talent policy is better analysed at the instrument level than as a single undifferentiated intervention.

Keywords: *talent policy; policy instruments; SSI SMEs; innovation; invention patents; China*

I. Introduction

Innovation-oriented small and medium-sized enterprises depend heavily on specialised knowledge, technical expertise, and skilled employees, yet their capacity to acquire and retain such human capital is often more constrained than that of larger firms. Governments have consequently adopted a wide range of talent policies intended to improve the conditions under which skilled workers are attracted, retained, and developed. In China, these interventions have become an important component of local innovation and industrial policy as regional governments compete for research and development (R&D) personnel, engineers, technical specialists, and other high-skilled workers.

Existing research provides growing evidence that talent-oriented government intervention can be associated with enterprise behaviour and innovation. Firm-level studies have linked local talent policy with corporate human capital, recruitment demand for R&D personnel, labour allocation, and innovation outcomes (Jin & Peng, 2022; Sun et al., 2023; Yu et al., 2024). Research on firms in western China likewise reports positive relationships between several forms of talent-policy support and enterprise innovation (Xu & Lu, 2022). These studies substantially advance understanding of the relationship between public talent intervention and firm outcomes.

Yet the literature still tends to collapse different forms of talent support into a single policy measure. Policy adoption, aggregate indices, programme-level treatments, and composite intensity measures are useful for estimating an overall relationship, but they can hide variation within the policy package itself. Financial, settlement-related, and professional-development measures address different constraints facing firms and skilled workers. A recent systematic review of SSI SME innovation identifies the same problem, noting that talent policies are often treated as homogeneous bundles and that differentiated policy classification remains underdeveloped (Xu & Abbas, 2026).

A policy-instrument perspective provides a useful basis for making this distinction. Policy objectives are implemented through specific

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instruments whose resources, delivery mechanisms, target relationships, and behavioural assumptions can differ substantially (Howlett, 2011). In innovation policy, instrument choice matters because different policy problems require different functions and forms of intervention (Borrás & Edquist, 2013; Edler & Fagerberg, 2017). Applied to talent policy, this perspective implies that asking whether 'talent policy' is associated with innovation may be too aggregate a question. A more informative question is whether functionally different talent-policy instruments exhibit equivalent relationships with firm innovation.

The present study addresses this issue by distinguishing three dimensions of talent-policy support in the Chinese context: monetary incentive policies (MIP), life-service support policies (LSP), and development-support policies (DSP). The distinction is functional rather than document-based. MIP represents pecuniary and material support, LSP addresses settlement and living conditions, and DSP concerns professional and innovation-development opportunities. This classification applies instrument logic to Chinese talent-policy packages rather than claiming that MIP, LSP, and DSP form a universal typology. Chinese policy-text research similarly identifies differentiated reward-, guarantee-, and development-oriented functions within regional talent policies (Li et al., 2024).

This disaggregation is particularly relevant for Specialized, Sophisticated, and Innovative Small and Medium-sized Enterprises (SSI SMEs). SSI SMEs constitute a policy-recognised group of innovation-oriented Chinese enterprises whose activities rely strongly on specialised human capital. Their comparatively limited organisational and financial resources may also make them sensitive to the particular form of policy support available. Yet evidence remains limited on whether differentiated talent-policy content has statistically distinguishable relationships with innovation within this enterprise population.

The study therefore examines 370 policy-recognised SSI SMEs in Chongqing over 2022–2026. The three policy dimensions are measured using rule-based indicators of applicable local policy-support content and are jointly estimated within the same firm-level panel model rather than analysed in separate regressions. This design makes it possible not only to examine whether each policy dimension is associated with innovation, but also to test formally whether the estimated policy coefficients differ from one another.

Because the paper is concerned with relative policy relationships, coefficient ordering alone is not enough. Nor does the significance of one coefficient and the non-significance of another prove that the two coefficients differ. The analysis therefore uses a joint equality test and pairwise contrasts to examine cross-instrument heterogeneity directly.

The primary model shows positive relationships between all three policy dimensions and annual invention patent applications. Within the common content-coverage metric, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients, while the LSP–DSP contrast is not significant. The results therefore support policy heterogeneity without establishing a complete ranking of the three instruments. Robustness checks also reveal different stability profiles: MIP and DSP are comparatively stable, whereas LSP remains positive but is more sensitive in statistical significance across alternative specifications and inferential procedures.

The paper contributes in three ways. It brings an instrument-level perspective to talent-policy research, showing that policies with the same broad objective can have different firm-level relationships. It adds evidence from policy-recognised SSI SMEs, a policy-relevant group that remains relatively underexamined in this literature. Finally, by constructing the three policy dimensions under a common coding framework and testing their coefficients within the same model, it provides a cleaner basis for comparing policy instruments than comparisons drawn from separate samples or specifications.

II. Theoretical Background and Hypotheses

2.1 Talent Policy through a Policy-Instrument Perspective

A policy-instrument perspective directs analytical attention from policy intention to the specific means through which governments attempt to influence target actors. Governments can pursue broadly similar objectives through financial transfers, public services, regulation, information, collaborative arrangements, capacity-building measures, and other instruments. These tools differ in the resources they mobilise, the constraints they address, the behaviours they seek to influence, and the administrative arrangements required for implementation (Howlett, 2011).

This distinction is particularly important for innovation policy. Innovation is rarely constrained by a single market or organisational failure, and governments therefore employ different instruments to address financing constraints, capability deficits, information problems,

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coordination failures, and other barriers (Borrás & Edquist, 2013; Edler & Fagerberg, 2017). Policy-mix research further cautions that instruments operate within broader combinations of goals, actors, and implementation arrangements rather than as isolated levers (Flanagan et al., 2011).

Talent policy has a similarly multidimensional structure. Recruiting and retaining highly skilled workers can be constrained by financial costs, relocation and settlement difficulties, and limitations in professional-development opportunities. Government intervention can address these constraints through functionally different provisions. Measures aimed at financial conditions, settlement conditions, and professional development may all be labelled talent policy, but they alter different components of the opportunity structure facing workers and firms.

The present study therefore treats MIP, LSP, and DSP as distinct but potentially complementary dimensions of the local talent-policy environment. The distinction concerns the primary function of policy content rather than the administrative title of the document in which it appears. The empirical measures capture the coverage of effective and applicable policy-support content. They do not measure whether a particular firm applied for a programme, whether an employee received a benefit, the fiscal value of support received, or the intensity with which a programme was implemented.

2.2 Monetary Incentive Policies and Innovation

Monetary incentive policies address the pecuniary costs associated with attracting, retaining, and supporting skilled human capital. In this study, MIP captures financial and material forms of talent support.

These instruments may be particularly relevant to smaller innovation-oriented firms. SSI SMEs frequently operate with more limited internal financial resources and shallower labour markets than large firms. Recruiting specialised R&D personnel can involve search costs, wage competition, relocation expenses, project expenditure, and uncertainty regarding the eventual commercial return from innovation. Financially oriented talent support can reduce some of these constraints or widen the set of skilled employees and innovation activities that a firm can feasibly support.

Firm-level Chinese evidence provides a basis for expecting such a positive relationship. Sun et al. (2023) show that local talent policies can increase firms' recruitment demand for R&D personnel and are associated with subsequent innovation inputs and outputs. Xu and Lu (2022) likewise report positive enterprise-innovation relationships for several forms of talent-policy support in western China. These studies do not measure MIP exactly as it is operationalised here, but they support the plausibility of a positive policy–innovation relationship.

H1. Monetary incentive policy support is positively associated with the innovation performance of SSI SMEs.

2.3 Life-Service Support Policies and Innovation

Life-service support policies address non-wage barriers associated with relocation, settlement, and continued residence. In this study, LSP captures public support directed at settlement and living conditions.

High-skilled workers make employment and mobility decisions on the basis of more than wages. Housing and broader settlement conditions can affect whether workers are willing to relocate or remain in a region. Chinese evidence shows that social-welfare and settlement conditions can interact with talent concentration and regional innovation (Wang et al., 2022), while Yang and Pan (2020) demonstrate that housing conditions can materially shape the outcomes of local talent competition.

For SSI SMEs, public life-service provision may be especially relevant because smaller firms are often less able than large organisations to provide extensive private relocation and family-support packages. If public provision improves the conditions under which skilled workers can enter and remain in the local labour market, firms may face a more favourable environment for sustaining innovation-related human capital. The path to observable patent output is nevertheless indirect and may depend on actual policy utilisation, retention, organisational integration, and time.

H2. Life-service support policy is positively associated with the innovation performance of SSI SMEs.

2.4 Development-Support Policies and Innovation

Development-support policies concern the professional and innovation-related opportunities available to skilled workers and firms. In this study, DSP captures professional-development and innovation-support opportunities.

Such measures differ from both direct financial incentives and settlement services because

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they expand opportunities through which knowledge can be developed, combined, and applied. Professional-development and collaborative opportunities can connect skilled workers with resources and relationships that support experimentation and technological problem-solving.

This logic is consistent with evidence that talent policy can alter how skilled labour is allocated within firms and thereby shape technologically intensive outcomes (Yu et al., 2024). Development-oriented policy instruments may therefore strengthen the external conditions under which SSI SMEs and their technical personnel participate in innovation activities, even though policy availability should not be equated with realised utilisation.

H3. Development-support policy is positively associated with the innovation performance of SSI SMEs.

2.5 Cross-Instrument Heterogeneity

H1–H3 concern the direction of the relationship between each policy dimension and innovation. A separate question is whether the magnitudes of these relationships are statistically equivalent. The policy-instrument literature provides no reason to assume equality: monetary incentives primarily alter financial conditions, life-service policies reduce settlement and household constraints, and development-support policies expand professional and innovation opportunities. These functions differ in their proximity to firm decision-making, the actors through which they operate, and the time required for their consequences to emerge.

Chinese studies also show that policy categories and policy combinations can exhibit heterogeneous innovation relationships (Chen et al., 2023; Li et al., 2024). However, existing taxonomies, levels of analysis, samples, and outcome measures vary substantially. The appropriate theoretical prediction is therefore heterogeneity rather than a predetermined ordering. This emphasis on cross-instrument heterogeneity also responds to recent calls for more differentiated policy measurement in talent-policy research (Xu & Abbas, 2026).

H4. The estimated coefficients for monetary incentive policies, life-service support policies, and development-support policies differ in magnitude.

H4 is evaluated first through a joint test of coefficient equality. If the joint null is rejected, pairwise contrasts are used to determine which specific coefficients differ. This procedure avoids inferring differences merely from numerical coefficient ordering or from separate significance tests.

Because MIP, LSP, and DSP are constructed under the same rule-based content-coverage framework and expressed on a common numerical metric, the equality tests compare coefficients on a consistent scale. The underlying policy content is not economically identical, however. The contrasts should therefore be interpreted as differences in estimated coefficients within the common content-coverage metric, not as direct comparisons of welfare, fiscal efficiency, or the economic value of individual policy measures.

III. Data and Methods

3.1 Research Setting and Sample

The study examines policy-recognised SSI SMEs in Chongqing, China. Chongqing provides an appropriate setting because its district- and county-level governments have implemented differentiated talent-support measures while the municipality has simultaneously promoted SSI SMEs as an important component of regional technological upgrading and industrial development.

The final sample comprises 370 firms selected through proportionate stratified random sampling across local jurisdictions. This procedure was designed to preserve geographic representation within the policy-recognised SSI SME population.

The empirical unit is the firm-year. The final panel contains 1,843 valid firm-year observations for 2022–2026.

Talent-policy measures are linked to firms according to the applicable local policy environment. Primary inference clusters observations across 38 local policy jurisdictions.

3.2 Data Sources

The empirical dataset combines official SSI SME recognition lists, local government policy documents, firm administrative records, and patent records. Policy content was coded after checking its effective period and geographic applicability.

The policy variables capture locally varying talent-support content applicable to sampled firms.

3.3 Measurement of Talent Policy Instruments

The measurement strategy focuses on policy-support content coverage rather than document counts. Each dimension is constructed from rule-based substantive categories coded from effective and applicable official policy content, following established content-analysis principles (Krippendorff, 2018; Neuendorf, 2017).

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The three policy dimensions are expressed on a common content-coverage metric to support comparison across instruments. Coding records the availability and applicability of relevant forms of local support without treating document volume as policy intensity.

MIP represents financial and material talent support.

LSP represents settlement and living-support services.

DSP represents professional and innovation-development support.

The indices measure the availability and applicability of policy-support content. They do not measure enterprise-level programme participation, actual subsidy receipt, utilisation intensity, fiscal expenditure, or realised policy benefits.

3.4 Reliability of Policy Coding

Policy coding followed a predefined protocol that checked effective period, geographic applicability, and substantive content, consistent with established content-analysis practice (Krippendorff, 2018; Neuendorf, 2017).

Independent recoding of a randomly selected subsample produced 96.35% agreement, providing evidence of coding consistency.

3.5 Innovation Performance

Innovation performance is measured by the annual number of invention patent applications submitted by each firm. Patent applications are assigned to years according to their application dates rather than grant dates because grant timing can be affected by administrative examination delays.

The 2026 measure includes invention patent applications observed through 30 June 2026 and is not annualised. Robustness checks therefore include a full-calendar-year sample (2022–2025) and alternative treatments of the patent-count outcome.

3.6 Empirical Model and Inference

The primary specification jointly estimates MIP, LSP, and DSP in a two-way fixed-effects model with firm fixed effects and year fixed effects. Joint estimation is essential because the three policy dimensions may coexist within the same local policy environment. Each coefficient therefore represents the conditional relationship between one policy dimension and innovation after accounting for the other two policy dimensions within the model.

Firm fixed effects absorb time-invariant enterprise heterogeneity, while year fixed effects absorb common annual shocks.

Because policy measures vary across local jurisdictions over time, firms within the same local jurisdiction may share common policy shocks and correlated disturbances. Primary inference therefore uses CR2 cluster-robust standard errors with Satterthwaite-adjusted degrees of freedom across 38 local policy clusters. These small-sample adjustments are designed to improve cluster-robust inference in fixed-effects settings when conventional large-cluster approximations may be unreliable (Pustejovsky & Tipton, 2018). H1–H3 are evaluated at the 5% significance level using coefficient direction and the corresponding CR2/Satterthwaite-adjusted p-value.

H4 is evaluated using a CR2-based joint equality test of the three policy coefficients, applying the same small-sample inferential framework to the multiple-parameter hypothesis (Pustejovsky & Tipton, 2018). If the equality null is rejected, pairwise contrasts are computed from the same jointly estimated model. This avoids comparing coefficients obtained from different samples, outcome scales, or inferential procedures.

3.7 Robustness Analyses

Robustness analysis focuses on three questions: whether the findings depend on the functional form used for the patent outcome, whether they are affected by the partial 2026 observation window, and whether they remain credible under alternative finite-cluster procedures. The analysis therefore uses alternative outcome specifications, a 2022–2025 full-calendar-year sample, and cluster-sensitivity procedures including leave-one-cluster diagnostics and wild cluster bootstrap inference (Roodman et al., 2019). The same finite-cluster checks are applied to the principal coefficient comparisons.

IV. Results

4.1 Primary Policy–Innovation Relationships

Table 1 presents the primary two-way fixed-effects results. MIP, LSP, and DSP are estimated jointly using 1,843 firm-year observations from 370 firms across 38 local policy clusters.

Table 1. Talent Policy Instruments and Invention Patent Applications

Policy	Beta (CR2 SE)	p	95% CI

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Policy	Beta (CR2 SE)	p	95% CI
MIP	6.453 (0.483)	<.001	[5.324, 7.582]
LSP	2.828 (0.705)	.036	[0.376, 5.281]
DSP	1.736 (0.264)	.005	[0.940, 2.532]

Note. Dependent variable = annual invention patent application count. Firm and year fixed effects are included. N = 1,843 firm-year observations, 370 firms, and 38 local policy clusters. Inference uses CR2 cluster-robust standard errors with Satterthwaite-adjusted degrees of freedom.

All three policy dimensions are positively associated with invention patent applications under the primary specification. MIP has a coefficient of 6.453 and is statistically significant at $p < .001$, supporting H1. LSP also displays a positive coefficient of 2.828 and is statistically significant at $p = .036$, supporting H2 under the primary decision rule. DSP has a coefficient of 1.736 and is statistically significant at $p = .005$, supporting H3.

The point estimates are numerically ordered as MIP, LSP, and DSP. Coefficient magnitude alone, however, does not establish statistically significant differences among the three policy dimensions. H4 therefore requires formal equality and pairwise contrast tests.

4.2 Cross-Instrument Heterogeneity

The joint equality test rejects the null that the three policy coefficients are equal, $F(2, 3.426) = 27.669$, $p = .008$. H4 is therefore supported. The pairwise comparisons in Table 2 show where the heterogeneity occurs.

Table 2. Cross-Instrument Coefficient Comparisons

Contrast	Statistic / Estimate	p	95% CI
Joint equality	F(2, 3.426) = 27.669	.008	--
MIP - LSP	3.624 (0.878)	.006	[1.484, 5.765]
MIP - DSP	4.717 (0.558)	<.001	[3.191, 6.243]
LSP - DSP	1.093 (0.753)	.249	[-1.405, 3.590]

Note. Joint equality tests H0: Beta(MIP) = Beta(LSP) = Beta(DSP). CR2 standard errors are shown in parentheses for pairwise contrasts. All contrasts are computed from the same jointly estimated primary model.

Within the common content-coverage metric, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients. The MIP–LSP difference is 3.624 ($p = .006$), while the MIP–DSP difference is 4.717 ($p < .001$). The LSP–DSP contrast is not statistically significant ($p = .249$). Consequently, the results support cross-instrument heterogeneity but do not support a complete statistical ordering of MIP > LSP > DSP.

The larger estimated MIP coefficient does not demonstrate universal policy superiority, greater cost-effectiveness, or higher social value. It indicates that, within the common content-coverage metric and the present model, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients for the observed patent outcome.

4.3 Robustness and Finite-Cluster Sensitivity

Across alternative outcome specifications and the 2022–2025 full-calendar-year sample, MIP and DSP remain positive and statistically supported. LSP also remains positive, but its statistical significance is more sensitive to specification.

Finite-cluster sensitivity checks lead to the same substantive distinction. MIP and DSP remain comparatively stable, whereas LSP is less precisely estimated under alternative cluster-based inference. The primary H2 decision is therefore retained, but its robustness is weaker than that of H1 and H3.

The cross-instrument result is also stable: the equality restriction continues to be rejected, the contrasts involving MIP remain supported, and the LSP–DSP contrast remains unsupported. These

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checks do not alter the substantive interpretation of H4.

V. Discussion

5.1 Differentiated Relationships rather than a Homogeneous Talent-Policy Effect

Taken together, the results point to a clear pattern: all three policy dimensions are positively associated with invention patent applications, but not to the same extent. That pattern fits an instrument-based view of policy, in which measures aimed at the same broad objective can operate through different functions and produce different organisational relationships (Howlett, 2011; Borrás & Edquist, 2013).

MIP shows the strongest and most stable association. This is plausible for SSI SMEs because monetary support is closely tied to immediate constraints around recruitment, retention, project participation, and innovation expenditure. A richer monetary-support environment may therefore connect more directly with activities that lead to observable patenting. Firm-level evidence that talent policy can affect R&D recruitment and innovation is consistent with this interpretation (Sun et al., 2023). The result should still be read in light of the measure used here: MIP records applicable policy content, not the subsidy actually received by a firm.

DSP is also positive and comparatively stable. Development-oriented support works through professional and innovation-related opportunities that can help firms use and extend specialised knowledge. Yu et al. (2024) likewise show that talent policy can reshape labour allocation and technology-intensive organisational outcomes. Its smaller coefficient does not imply that development support is less valuable overall; some benefits may take longer to appear or may be reflected in outcomes other than annual patent counts.

5.2 Why the MIP Coefficient Is Statistically Larger

The clearest comparative result is that, within the common content-coverage metric, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients, while the LSP–DSP difference is not statistically significant. One plausible explanation is the proximity of monetary support to immediate firm constraints. Financial limitations can directly affect recruitment, compensation, R&D expenditure, and the retention of scarce technical personnel, giving monetary support a shorter path to the patent outcome used in this study.

Life-service and development-support measures may take longer to work through the firm because their effects depend on mobility, retention, professional development, and organisational integration before reaching innovation output. Evidence from Chinese research shows that settlement and social-welfare conditions can shape talent concentration and regional innovation (Wang et al., 2022; Yang & Pan, 2020).

The outcome measure may reinforce this difference. Invention patent applications capture a specific form of formalised technological output. Financial support may show up relatively quickly in R&D activity linked to patent filing, whereas life-service and development measures may first affect retention, capability building, or collaboration—benefits that annual patent counts only partly capture.

These are plausible interpretations, not identified mechanisms. The data do not observe firm-level take-up, employee-level use, policy expenditure per firm, or the timing of actual benefit receipt. The comparison establishes that the coefficients differ; it does not establish why they differ.

5.3 The LSP Result: Directionally Stable, Inferentially Sensitive

LSP is the less clear-cut result. Under the pre-specified primary rule, its coefficient is positive and statistically significant, and it remains positive across the robustness analyses. Its statistical significance, however, is more sensitive to alternative specifications and finite-cluster inference.

That pattern is plausible for a policy instrument whose route to firm innovation is relatively indirect. Life-service support must first affect mobility, settlement, or retention before any firm-level innovation consequence can emerge. Differences in actual use, together with finite-cluster uncertainty, can reduce precision even when the estimated direction remains stable.

Accordingly, H2 remains supported under the primary decision rule, but with a weaker robustness profile than H1 or H3. The consistent positive direction matters, as does the greater sensitivity of statistical significance. Both features should be reported rather than reduced to a single significant/non-significant label.

5.4 Why the Non-Significant LSP–DSP Contrast Matters

The non-significant LSP–DSP contrast also prevents overreading the coefficient ordering.

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Although the point estimates can be written as MIP > LSP > DSP, the pairwise tests support only the two contrasts involving MIP. The data do not show that LSP is statistically stronger than DSP.

This is why H4 is tested with formal contrasts rather than separate significance tests. When the research question concerns relative policy relationships, the difference between coefficients has to be tested directly.

VI. Contributions and Implications

6.1 Theoretical Contribution

The theoretical point is that treating talent policy as one aggregate variable can mask differences that matter empirically. MIP, LSP, and DSP pursue a common talent objective, but the results show that their relationships with firm innovation are not statistically identical. An instrument-based perspective therefore adds useful structure to talent-policy analysis at the firm level.

The study does not propose MIP, LSP, and DSP as a universal taxonomy. It uses a policy-instrument perspective to make functional differences within Chinese talent-policy packages explicit and testable. This reading is consistent with Chinese policy-text evidence that distinguishes reward-, guarantee-, and development-oriented policy functions (Li et al., 2024).

6.2 Empirical and Measurement Contribution

Empirically, the study compares three policy dimensions for the same policy-recognised SSI SMEs, over the same years, on the same outcome scale, and under the same inferential procedure. That common framework makes the cross-instrument comparison more interpretable than a comparison assembled from unrelated studies or models.

The measurement contribution is equally practical. The indices are built from substantive policy-support content rather than document counts and separate policy availability from firm participation or realised benefit. The 96.35% independent recoding agreement also provides evidence of coding consistency.

6.3 Policy and Managerial Implications

For policymakers, the results argue against treating talent-policy measures as interchangeable. The useful question is which constraint a particular instrument is intended to address and how the resulting policy mix fits the needs of target firms and skilled workers. The estimated MIP coefficient is the largest for patenting within the common content-coverage metric in this setting, but that finding alone is not a case for a monetary-first policy rule because the analysis does not compare fiscal cost, take-up, welfare effects, or long-term capability gains.

LSP should also be judged against outcomes closer to its intended function. Settlement and living-support measures may matter for attraction and retention even when their relationship with annual patent counts is less statistically stable. Mobility, retention duration, turnover, and workforce stability would therefore be useful complementary outcomes in future evaluations.

The same applies to DSP. Development-oriented support may build professional and innovation capabilities over a longer horizon than annual patent data can capture.

For SSI SME managers, the implication is broader than subsidy seeking. Firms can treat the local policy environment as a portfolio of external resources and identify which financial, settlement, and development measures fit their recruitment and innovation needs. The benefit will depend on whether firms can recognise eligibility, access relevant programmes, and connect that support to internal staffing and innovation decisions.

VII. Limitations and Future Research

Several limitations define the boundaries of the findings. First, the study is observational. Firm and year fixed effects absorb time-invariant enterprise characteristics and common year shocks, but they do not eliminate all possible time-varying confounding factors. The coefficients should therefore be interpreted as conditional relationships within the specified empirical model rather than experimental treatment effects.

Second, the policy variables measure the coverage of effective and applicable official support rather than enterprise-level policy receipt or use. The analysis does not observe programme take-up or utilisation intensity. Future research could combine policy-environment measures with participation or expenditure data.

Third, the content-coverage measures do not capture differences in fiscal scale, programme quality, eligibility thresholds, implementation strength, or the economic value of individual forms of support. Future research could combine coverage measures with comparable information on policy intensity, implementation, or expenditure where such data are available.

Fourth, innovation performance is measured by invention patent applications. This captures an important formal output of technological activity but does not represent all dimensions of

innovation. Future studies could examine patent quality, citations, new-product sales, process innovation, commercialisation performance, productivity, or long-term firm growth.

Fifth, the 2026 patent count covers only the period to 30 June. The primary model retains these observed values without annualisation, and the 2022–2025 robustness specification partly addresses the shorter window. Complete 2026 records would nevertheless allow the full five-year period to be reassessed.

Sixth, the analysis is confined to SSI SMEs in Chongqing. The institutional environment, local talent-policy system, industrial structure, and administrative context may differ across Chinese regions and other countries. Replication across provinces, municipalities, and national settings would help assess generalisability.

Finally, the study compares contemporaneous policy relationships. Some instruments may operate with delays, and the present design does not estimate those longer-term responses. Future research can examine lagged effects and possible complementarity among policy instruments.

VIII. Conclusion

This study compares three functionally different talent-policy instruments in 370 policy-recognised SSI SMEs in Chongqing. Using 1,843 firm-year observations and finite-cluster-adjusted inference, the primary model finds positive relationships between MIP, LSP, DSP and annual invention patent applications.

The comparison among instruments is more revealing than the individual coefficients alone. Within the common content-coverage metric, the estimated MIP coefficient is statistically larger than the estimated LSP and DSP coefficients, while the LSP–DSP difference is not statistically significant. MIP and DSP also show stronger robustness profiles; LSP remains positive but its statistical significance is more sensitive to specification and inference.

The result should not be turned into a universal ranking of talent policies. It shows something narrower: when different policy instruments are represented by a common content-coverage metric and examined within the same firm-level framework, their estimated relationships with innovation need not be equivalent. The common numerical scale does not make the underlying policy items economically identical.

For talent-policy research, the next question is therefore not simply whether policy works, but which instrument is being used, which constraint it addresses, and how firms translate that support into innovation over time.

References

[1]. Borrás, S., & Edquist, C. (2013). The choice of innovation policy instruments. *Technological Forecasting and Social Change, 80*(8), 1513–1522. https://doi.org/10.1016/j.techfore.2013.03.002

[2]. Chen, Q., Sun, T., & Wang, T. (2023). Synergy effect of talent policies on corporate innovation—Evidence from China. *Frontiers in Psychology, 13*, Article 1069776. https://doi.org/10.3389/fpsyg.2022.1069776

[3]. Edler, J., & Fagerberg, J. (2017). Innovation policy: What, why, and how. *Oxford Review of Economic Policy, 33*(1), 2–23. https://doi.org/10.1093/oxrep/grx001

[4]. Flanagan, K., Uyarra, E., & Laranja, M. (2011). Reconceptualising the 'policy mix' for innovation. *Research Policy, 40*(5), 702–713. https://doi.org/10.1016/j.respol.2011.02.005

[5]. Howlett, M. (2011). *Designing public policies: Principles and instruments*. Routledge.

[6]. Jin, Z., & Peng, L. (2022). Local talent introduction policies and corporate human capital. *Journal of Financial Research, 508*(10), 117–134.

[7]. Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). SAGE Publications.

[8]. Li, X., Zhao, H., Jiang, F., & Liu, Y. (2024). China's regional talent policies and regional innovation performance: An innovation measurement and empirical test based on 3,171 policy texts. *Journal of Finance and Economics, 50*(9), 4–18. https://doi.org/10.16538/j.cnki.jfe.20240716.301

[9]. Neuendorf, K. A. (2017). *The content analysis guidebook* (2nd ed.). SAGE Publications.

[10]. Pustejovsky, J. E., & Tipton, E. (2018). Small-sample methods for cluster-robust variance estimation and hypothesis testing in fixed effects models. *Journal of Business & Economic Statistics, 36*(4), 672–683. https://doi.org/10.1080/07350015.2016.1247004

[11]. Roodman, D., Nielsen, M. Ø., MacKinnon, J. G., & Webb, M. D. (2019). Fast and wild:

Bootstrap inference in Stata using boottest. *The Stata Journal, 19*(1), 4–60. https://doi.org/10.1177/1536867X19830877

[12]. Sun, K., Luo, T., & Xiao, X. (2023). Talent policy, R&D personnel recruitment and corporate innovation. *Frontiers of Business Research in China, 17*(2), 162–189. https://doi.org/10.3868/s070-008-023-0008-8

[13]. Wang, X., Wang, X., & Liu, F. (2022). Social welfare, hukou promise for talents and regional innovation performance: Re-examination of the 'talent scramble battle'. *Economic Science, 44*(3), 65–78. https://doi.org/10.12088/PKU.jjkx.2022.03.05

[14]. Xu, H. M., & Lu, Y. (2022). Can talent introduction policies promote enterprise innovation in western China? *China Economics*, (4), 19–56, 282–283.

[15]. Xu, Z., & Abbas, M. S. (2026). The impact of talent introduction policies on SSI SMEs' innovation performance in China: A systematic literature review from the perspective of human capital allocation efficiency. *International Journal of Engineering, Management and Humanities, 7*(4), 76–86. https://doi.org/10.5281/zenodo.21884001

[16]. Yang, Z., & Pan, Y. (2020). Human capital, housing prices, and regional economic development: Will 'vying for talent' through policy succeed? *Cities, 98*, Article 102577. https://doi.org/10.1016/j.cities.2019.102577

[17]. Yu, M., He, M., & Zhang, M. (2024). Talent introduction policies, optimal labor allocation, and manufacturing intelligence. *China Industrial Economics*, (5), 116–134. https://doi.org/10.19581/j.cnki.ciejournal.2024.05.007