Facilitating or inhibiting? Effect of professionalization of village cadres on cadre-farmer relationship

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ABSTRACT

As the rural revitalization strategy is being comprehensively and deeply implemented in China, the professionalization of village cadres (PVC) has been deemed a crucial approach to advancing rural governance systems. However, the effect of PVC on rural governance, specifically the cadre-farmer relationship (CFR), is far from clear. This paper aims to investigate how PVC affects CFR and provide policy recommendations for improving village cadre management and enhancing the CFR. We empirically analyze the impact of PVC on CFR with a hierarchical linear model based on micro-survey data from 10 provinces (municipalities) collected in 2022. Our results show that PVC generally has a significant positive effect on CFR. Specifically, job formalization (JF) and management standardization (MS) would significantly improve CFR, while promotion institutionalization (PI) and sustainable development (SD) have slightly insignificant negative effects on CFR. Mechanism analysis suggests that PVC affects CFR by promoting extent to which cadres act legally (CAL), as well as the efficiency of village affairs implementation (EVAI). Heterogeneity analysis reveals that the positive effect of PVC on CFR is most pronounced in villages with both high governance density and abundant governance resources, followed by those with low governance density but rich resources; no significant effect is observed in villages with either high density but scarce resources, or both low density and low resources. Thus, we suggest that PVC implementation should be tailored to local conditions and needs to promote the cadre-farmer relationship.

1. Introduction

The cadre-farmer relationship (CFR) refers to the interactions and behaviors between villagers and village cadres through their work (Pan et al., 2023). As a form of social capital, CFR plays a key role in improving rural governance performance (Cao et al., 2020; Alam and Liu 2024; Nguyen-Trung et al., 2024). Theoretically, a sound CFR can reduce information asymmetry, enhance farmers' trust in village organizations, prevent opportunistic behavior (Fisher, 2013), and promote the effective integration of administrative and social forces (Jian et al., 2024). Empirical studies show that a good CFR plays an important role in promoting farmers' income growth (Melendres et al., 2022), maintaining irrigation facilities (Mahaarcha and Sirisunhirun, 2023), rural living environment improvement (Hao et al., 2023), and even safeguarding rural social stability as well as the foundation of the political parties (Chen et al., 2025; Kennedy and Chen, 2018; Zhong, 2017). Therefore, exploring the factors that influence CFR is of great significance.

Village cadres perform dual roles of "government agents" and "villagers' stewards" by assisting the government in performing "official duties" while managing "village affairs" for villagers (Oi, 1991; Tang et al., 2020; Qiao et al., 2025). They have significant responsibilities, including safeguarding grassroots democracy, developing the rural economy, promoting village public affairs, maintaining village harmony and stability, and enhancing villagers' well-being (Wang and Liu, 2022; Zhang et al., 2012; Zhang and Wang, 2021; Zhao, 2023; Qian et al., 2025). To some extent, their behavior and performance will directly influence the quality of the CFR. On a deeper level, the behavior and performance of village cadres are influenced by the socio-economic systems during certain periods. For instance, before the 2006 tax and fee reforms, one of the main duties of village cadres was to assist the government in collecting agricultural taxes and various rural fees (Alm and Liu, 2014). The collection of these fees not only increased the workload of village cadres but also strained their relationship with

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villagers (Jian et al., 2024). After the tax and fee reform, village cadres no longer took on tax collection duties, and the CFR became more harmonious and stable over time (Wang and Shen, 2014). In recent years, the continuous adjustment of urban-rural relations has led to profound changes in the governance structure in rural China. The transition in grassroots governance from resource extraction to resource input denotes a completely new way of state power embedding in rural society, resulting in a substantial transformation in the logic and methodologies of rural governance (Jing, 2018). The professionalization of village cadres (PVC) is one of the manifestations of such transformation (Oi et al., 2012).

The initial purpose of PVC is to stabilize the grassroots governance team and improve the effectiveness of rural governance by integrating village cadres into the management system of professional cadres (Zhang et al., 2023; Zhao et al., 2021). It is important to note that the term PVC is a China-specific concept that reflects the country's unique institutional and governance context. In the broader international literature, similar processes are typically discussed under the frameworks of the bureaucratization of grassroots governance (Iversen et al., 2025; Esparcia et al., 2015; McDonnell, 2017). In this study, we use "professionalization" rather than "bureaucratization" for several reasons. First, village cadres in China are not formal civil servants; instead, certain practices and principles from the civil service system are selectively applied to their management. Significant differences remain between village cadres and state civil servants in terms of election, promotion, performance evaluation, and welfare benefits—far from constituting a Weberian-style bureaucracy (Weber, 1978). Moreover, "professionalization" is a more neutral and less value-laden term compared to "bureaucratization", allowing for a more objective expression. Nevertheless, the two terms do share certain conceptual similarities, as both imply a tendency toward more standardized and specialized governance. In practice, PVC has four main characteristics: firstly, the job position for village cadres is formalized, which means village cadres should practice the sitting system. Secondly, the remuneration system for the village cadre is formalized, with a salary system tailored to their duties, workload, and performance. This system offers fixed salaries and welfare benefits similar to those enjoyed by salaried employees, thereby ensuring a stable income for village cadres. Third, the management system is standardized, denoting scientific management and incentive mechanisms. Fourth, the development of village cadres is sustainable, which means that village cadres have opportunities for promotion and retirement security (Zhao, 2023; Zhang, 2020).

However, the influence of PVC on CFR remains controversial. Scholars with a positive view argue that PVC reflects a social re-division of labor as society and the economy progress. This process meets the demands for constructing service-oriented governance and addresses the outflow of rural residences, material, and financial resources, which is a kind of demand-induced institutional change (Shen, 2014). Some scholars argue that PVC enhances the attractiveness of village cadre positions, thereby effectively addressing issues such as inefficiency, inaction, and passivity exhibited by village cadres (Gao, 2019). Moreover, replacing village cadres' work subsidies with salaries can not only reduce the financial burden on village collectives but also mitigate the tense interest-driven conflicts between cadres and villagers, thereby cultivating a more positive CFR environment (Li and Wang, 2011). Evidence from international development experience also suggests that appropriate bureaucratic management offers significant advantages in areas such as organizational mobilization, poverty reduction, and pandemic response (Dutta and Fischer, 2021; Evans and Rauch, 1999; Lotta et al., 2022). Conversely, critics argue that PVC essentially reinforces the role of village cadres as state agents. This not only increases rural governance costs and national financial burden (Oi et al., 2012; Xiong and Zheng, 2022) but also creates an organizational disconnection between the state and society (Zhang, 2016). Such disconnection would lead to the absence of mass-oriented work in rural governance and a suspension of CFR (Du, 2022; Wang, 2015; Li et al., 2025).

Additionally, some scholars argue that the full-time governance model is generally incompatible with rural society, leading to severe formalism and the involution of grassroots governance (He, 2019; Ning et al., 2005), as well as squeezing the space for grassroots democracy (Meier et al., 2019). Other scholars deem that the relevant incentive mechanisms of PVC remain underdeveloped and are insufficient to effectively motivate village cadres (Zhao, 2023). Tian (2025) further pointed out that while the professionalization of village cadres has strengthened their dependence on and loyalty to the government, it has failed to enhance—and may even have diminished—their capacity to engage effectively with villagers. A study from India shows that although Block Development Officers hold clearly defined bureaucratic positions and enjoy stable remuneration, they often experience "bureaucratic overload", which undermines policy implementation and erodes trust between grassroots officials and villagers (Dasgupta and Kapur, 2020). Therefore, some scholars argue that PVC is not an inevitable path to achieving the modernization of grassroots governance (Wang, 2019). Nevertheless, despite these debates remaining unresolved, PVC has become a prominent trend in rural grassroots governance in China (Gui, 2020).

Overall, existing academic research on the impact of the PVC on CFR shows substantial disagreements and contradictory findings. However, these studies generally lack constructive theoretical dialogue and are trapped in a dilemma of insufficient empirical explanation and unresolved theoretical tensions. Moreover, research on the enabling conditions, mechanisms, and influencing factors of PVC have received limited theoretical attention. Examining the existing debates on the PVC reveals that many scholars are entrenched in a dualistic perspective centered on either the "state-centric" or "society-centric" view. Regardless of the theoretical stance adopted, these studies often treat the state and society as mutually exclusive and isolated entities, neglecting internal diversity within each sphere and the dynamic interactions between them. This binary framework falls short of explaining the complexity and hybridity evident in China's rural governance practices. In fact, rural governance in China represents a system of intricate complexity, in which both the "state" and "society" are indispensable components. Rather than existing in a zero-sum opposition, they constitute different facets of grassroots governance capacity under the broader state apparatus (Zhang and Zhang, 2022). Village cadres serve as vital bridges linking the Party and government to the peasantry, embodying dual roles as both state agents and village representatives. This duality inherently limits the applicability of state-society dichotomies to explain China's rural governance. Therefore, it is necessary to move beyond the traditional state–society dichotomy and examine the governance effects of village cadre professionalization from the theoretical perspective of state–society interaction.

Furthermore, most of the current literature analyzes the effect of PVC on CFR with empirical summaries or theoretical deductions based on several typical cases. This has led to a research landscape characterized by excessive speculation and insufficient empirical evidence. It is crucial to recognize that China is a "heterogeneous country", with remarkable regional and socio-economic differences. Studies based on small-sample cases inevitably suffer from lacking generalizability of conclusions and fail to reveal the influence mechanisms of PVC to CFR, which accordingly fails to provide sufficient support for precise policy interventions. In addition, few studies have explored the moderating mechanisms and group differences in the effects of PVC, leaving the influence of the professionalization of village cadres far from clear.

To bridge the research gap, we, in this paper, use large-sample data, collected from a household survey conducted in 10 selected provinces in China, to empirically estimate the effect of PVC on CFR and reveal the underlying influence mechanisms, and explore heterogeneous effects. Our research intends to address the following questions: first, does PVC affect CFR? If so, what are the influence mechanisms? Second, what types of villages are suitable for professional village cadres? Answering these questions will not only clarify the current academic debates

concerning PVC but also provide crucial policy insights for improving cadre management practices and enhancing rural governance efficiency.

The rest of the paper is structured as follows. We introduce the theoretical framework for the effect of PVC on CFR, followed by a description of the data, measures, and empirical strategy used in this study. The fourth part presents the empirical results of the effect of PVC on CFR, influence mechanisms, and heterogeneity analysis. Finally, we discuss our results and give policy suggestions, respectively.

2. Theoretical framework

2.1. PVC in China

Since the founding of New China, village cadres have typically served in a part-time capacity and earned most of their income from other activities (Zhang et al., 2012). Since the implementation of the household contract responsibility system, rural society has been revitalized, the commodity economy emerged gradually, and the workload of grassroots management has been reduced as well. Villager self-governance mainly focused on coordinating agricultural production and providing public goods. Due to the seasonal nature of agricultural production, a part-time village cadre working system was able to meet the needs of rural work. However, exceptions existed in regions like southern Jiangsu Province. After the reform and opening up, collective enterprises were established in southern Jiangsu Province based on former social enterprises, organizing rural labor and capital participation in market business activities in a collective form. In the 1980s and 1990s, township and village enterprises flourished in these regions. Unlike other regions where the responsibilities of village cadres were reduced, cadres in southern Jiangsu needed to be responsible for the daily management of collective enterprises. As a result, village cadres in southern Jiangsu were professionalized earlier (Gui, 2020).

In the mid-to-late 1990s, industrialization and urbanization in coastal regions accelerated. Rural governance transformed in some villages driven by state-led land acquisition. Influenced by urbanization, rural grassroots management in coastal areas gradually shifted away from agricultural production, and village governance evolved in the direction of communication. In some regions, such as the Yangtze River Delta and Pearl River Delta, urbanization zones have emerged, featuring high mobility of urban and rural resources and progression toward urban-rural integration. The urban community governance model has begun to influence rural areas, leading to the PVC being gradually promoted in these regions. With large numbers of migrants moving into these economically developed coastal areas, the workload at the grassroots level intensified. PVC has adapted to a certain extent to the local situation. However, during this period, the work of village cadres in most villages in the central and western regions still focused on maintaining the basic production and living order and assisting superiors in implementing tasks. Governance in these areas largely adhered to a semi-formal logic (Huang, 2008).

With the abolition of the agricultural tax, the long-standing resource outflow from rural areas reversed, followed by an influx of various resources into the countryside (Chen et al., 2025). Along with the inflow of these resources, standardized policies, regulations, procedures, and increased supervision and inspections were introduced in rural areas (He, 2023). These additional tasks, higher demands, and top-down standards, norms, and procedures made village governance in the central and western regions, which previously aimed only at maintaining basic order in villages, unable to adapt to the situation (Gui, 2020). Especially in the period of poverty alleviation, precise poverty alleviation has become the top political task. Around this work, village cadres had to repeatedly check the information of poverty-alleviation households, build files and cards, and put in a lot of time and energy in order to cope with the requirements of the higher level's fine-tuned assessment. Meanwhile, with the deep development of a socialist market economy, the "migrant labor economy" becomes prevalent. The income from

working outside is far exceeding the combined income from farming and village cadre allowances, which seriously dampened the motivation of village cadres (Wang, 2017). To stabilize grassroots governance teams, better regulate village cadres' behavior, and ensure smooth implementation of rural policies, the central and western regions began to explore the PVC. Currently, as the rural revitalization strategy enters a stage of comprehensive implementation, PVC has increasingly become a key approach in establishing rural governance systems across regions (Jing, 2018).

2.2. The effect of PVC on CFR

The CFR is influenced by multiple factors. It not only depends on the individual characteristics of farmers or village cadres but also relevant to the institutions and the social and cultural environment. The institutional analysis and development (IAD) framework developed by Ostrom (2005) offers a systematic approach to analyzing the complex interactions of social and human behavior, which can reveal the influence mechanisms. As a general analytical framework, the IAD framework analyzes how objective institutional environments—such as geographical conditions, economic and social attributes, and institutional rules—interact to shape the action situations faced by actors, and how actors respond according to the incentive structure defined by these situations, ultimately producing institutional outcomes and performance (Wang and Shu, 2021). It has been widely applied in various fields, including public resource management (Horowitz, 2021; Meerkerk, 2024), agricultural and rural development (Su et al., 2023; Wang et al., 2020), and urban governance (Adams and Zulu, 2015; Gomes and Hermans, 2018).

A core principle of the IAD framework is that actors' decisions are influenced not only by external environments and individual characteristics but also by institutional rules. These rules shape action situations to some extent, influencing actors' incentive mechanisms and decision-making logic (Cao et al., 2020). In this study, the status of CFR is regarded as a key outcome reflecting institutional performance. According to the IAD framework (Fig. 1), actors' behaviors are conditioned not only by external variables, such as biophysical conditions and socio-economic context, but also by action rules. Specifically, Action rules refer to actual institutional arrangements and behavioral norms in village governance, encompassing both formal and informal dimensions. Informal institutions primarily include clan networks, interpersonal relationships, village conventions, and local customs (Minbaeva et al., 2023). These rules are embedded in kinship, geographic proximity, and emotional ties, shaping the interaction logic and behavioral boundaries between village cadres and villagers through implicit norms and value expectations. Formal institutions include state laws and grassroots governance arrangements, such as the "one shoulder pole" system and the village affairs disclosure mechanism. These also encompass the PVC, the core institutional focus of this study. The action arena encompasses both the actors and action scenarios. Action scenarios refer to the decision-making and action processes through which actors seek to safeguard their interests. In this study, the governance interactions between village cadres and villagers are conceptualized as the critical action arena. The primary actors in this arena include village cadres, represented by village Party secretaries, and ordinary villagers, who engage in institutionalized interactions involving the discussion, decision-making, and implementation of public affairs. Both formal and informal rules operate in tandem to shape participation patterns, authority-responsibility structures, and behavioral incentive mechanisms in village governance, thereby influencing the trajectory of CFR and broader institutional outcomes.

Among the institutional rules, PVC—as a highly policy-oriented formal arrangement—exerts a crucial influence on the operational logic of village governance and the interaction mechanisms of CFR. On the one hand, PVC may modify the incentive structures and time allocation patterns of village cadres, enhancing their administrative competence and governance responsiveness. On the other hand, it may
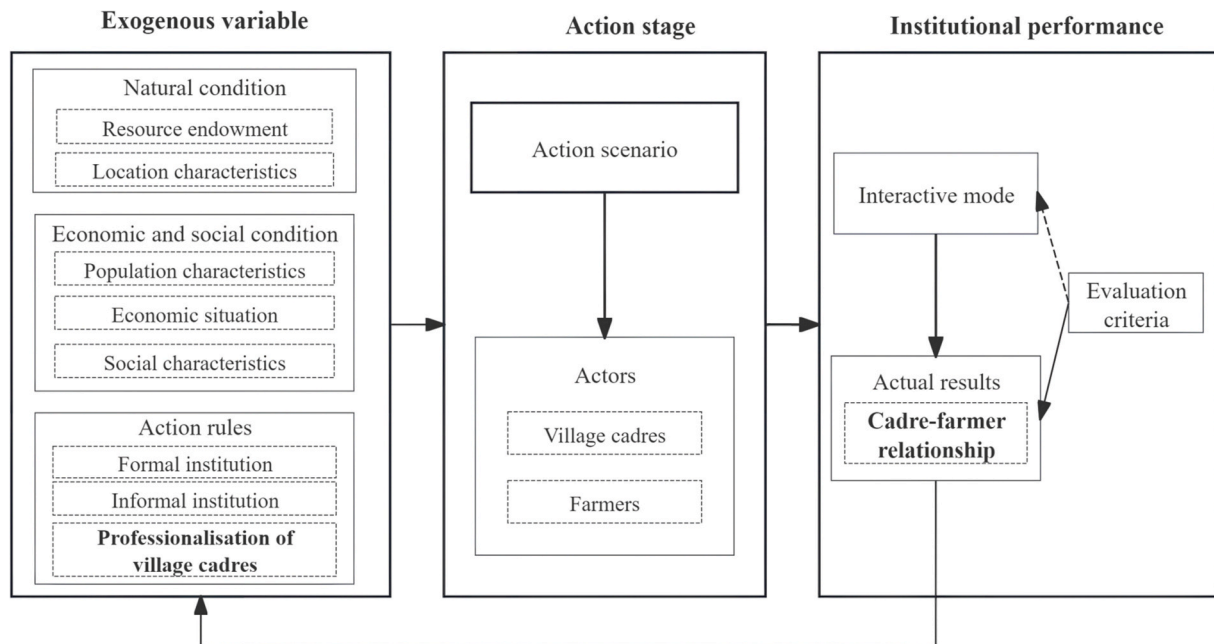
Fig. 1. IAD framework.

redefine the boundaries of responsibility and interaction between cadres and villagers, thereby profoundly influencing levels of perception, trust, and cooperation in CFR. Thus, PVC is not only a concrete embodiment of action rules, but also a pivotal variable shaping the structure of the action arena and affecting institutional performance. Specifically, this study examines the impact of PVC on CFR on the following three aspects in light of its practical implementation.

First, the PVC strengthens the village cadres' professional identity and reinforces their public service motivation. According to social identity theory, individuals' identification with their professional role significantly shapes their sense of responsibility, role engagement, and job performance, serving as a crucial psychological mechanism that drives organizational behavior (Ashforth and Mael, 1989). For village cadres, their sense of professional identity not only determines whether they recognize the social value of their position but also influences the extent to which they are willing to engage in governance activities oriented toward the public interest. The PVC means the formalization of the occupational identity of village cadres, which is often accompanied by improved welfare, including financial compensation, social security, and career development opportunities, and so on. These institutional arrangements not only increase the attractiveness of the position but also strengthen cadres' sense of professional identity and organizational belonging. Consequently, village cadres become more willing to adhere to professional norms and devote themselves to grassroots service, thereby exerting a positive influence on CFR.

Second, the PVC contributes to enhancing the stability and standardization of their role performance. According to organizational behavior theory, formal institutional arrangements exert structural constraints and guidance on individual behavior. The clearer the institutional rules and the more explicit the role responsibilities, the more likely individual behaviors are to become institutionalized, professionalized, and standardized (March and Olsen, 2010). For a long time, village cadres typically held part-time roles, balancing governance responsibilities with agricultural production and household duties, which made sustained engagement in village affairs difficult. In addition, the absence of effective institutional oversight and constraints often resulted in blurred responsibilities, arbitrary behavior, and weak accountability in their role performance—factors detrimental to the improvement of CFR. With the implementation of PVC, cadres now remain regularly on duty, which not only enhances their capacity to perceive and respond to

villagers' needs but also provides stable time and energy for tasks such as mass mobilization, coordination of village affairs, and conflict mediation (Gao, 2019). At the same time, the responsibilities and authority boundaries of village cadres have become clearer, and complementary assessment and oversight mechanisms have been gradually institutionalized. Under multiple institutional constraints, the stability and standardization of village cadres' role performance have been significantly strengthened, thereby providing institutional safeguards for the improvement of CFR.

Third, the PVC improves the working ability of village cadres. According to human capital theory, individuals enhance their knowledge and skills through education, training, and experiential accumulation, thereby improving efficiency and performance in their roles (Becker, 1964). Under part-time arrangements, village cadres often face identity instability and fragmented time commitments, resulting in limited access to systematic training and consequently leading to deficiencies in policy implementation, public affairs management, and communication with villagers. Following the implementation of PVC, various training opportunities have also emerged. Through training, it helps village cadres to improve their abilities in agricultural technology, land planning, industrial development, project management, communication, etc., so as to better cope with various problems and challenges in the process of rural governance. In summary, PVC contributes to forming a more efficient, professional, and adaptable cadre team, thereby enhancing the CFR.

Based on the above analysis, the following research hypothesis is proposed.

H1. PVC has a significant positive effect on CFR.

It is important to emphasize that China is a typical "heterogeneous country". Due to the diversity of governance actors and resource endowments across villages, the foundations and practices of rural governance often display significant heterogeneity. Therefore, the impact of PVC on CFR varies across villages. Previous research suggests that intensive governance demands and abundant governance resources are the fundamental conditions for PVC to exert its effects (Wang, 2019). The former ensures the necessity and rationality of PVC, while the latter provides the economic foundation and practical guarantees for its implementation. Drawing on this research, this paper categorizes villages into four types based on two dimensions: governance resources

and governance density (Fig. 2). These are, in order: high governance density with high governance resources (Type A villages), low governance density with high governance resources (Type B villages), low governance density with low governance resources (Type C villages), and high governance density with low governance resources (Type D villages). These four village types correspond to four governance patterns faced by village cadres: "many tasks, ample funding", "few tasks, ample funding", "few tasks, limited funding", and "many tasks, limited funding".

According to the Job Demands–Resources (JD-R) model proposed by Bakker and Demerouti (2007), job demands and resources interact to jointly shape individual performance and outcomes. When job resources fail to meet job demands, or when individual effort and reward are imbalanced, burnout is likely to occur. Extending this framework to rural governance suggests that the effectiveness of PVC depends on the alignment between governance resources and governance density. Specifically, in A villages, cadres face substantial work pressures, but abundant governance resources (e.g., improved salaries and welfare benefits) effectively strengthen their motivation. As a result, implementing PVC in these villages is most likely to improve CFR. In B villages, while sufficient material resources exist to support PVC, the lack of governance density may lead to idle use of resources or formalism, resulting in idle-type governance. In C villages, governance density and resources are relatively balanced but remain at low levels, resulting in inefficient practices. Under such conditions, cadres tend to adopt maintenance-type governance strategies, which have limited effects on CFR. In D villages, despite the theoretical necessity of PVC due to intensive governance demands, the lack of sufficient resources prevents effective incentives. Forced implementation of PVC in such settings often produces fatigue-type governance, which may even undermine CFR.

Based on the above analysis, the following hypothesis is proposed.

H2. The impact of PVC on CFR is heterogeneous and depends on whether governance resources and governance density are effectively aligned.

2.3. Mechanism analysis of the impact of the PVC on CFR

According to the IAD framework, institutional rules influence actors' behavior and interactive mode and ultimately affect outcomes (Ostrom, 2011). In this study, village cadres are regarded as key actors within the action arena and direct carriers of the PVC. Their behavioral changes not

only reflect the effectiveness of institutional implementation but also play a pivotal role in shaping the evolution of CFR. Specifically, this study argues that PVC influences CFR by improving the extent to which cadres act legally (CAL) and enhancing the efficiency of village affairs implementation (EVAI). With the advancement of PVC, the selection of village cadres has become increasingly standardized and institutionalized. Through open recruitment and cross-village selection, more cadres are now appointed via formal examinations and evaluation procedures. The diversification of cadre recruitment (contrasting with the earlier rule that cadres must come from the local village) has weakened the influence of kinship ties and personal networks on village governance. Consequently, cadres increasingly rely on formal institutions and legal norms in decision-making and implementation, while the influence of informal factors has been significantly reduced. At the same time, professionalization entails stricter supervision and constraints. On the one hand, upper-level governments impose constant pressure through increasingly comprehensive evaluation systems; on the other hand, the implementation of the responsibility checklist system clarifies job boundaries, reducing arbitrariness and rent-seeking risks in the exercise of power (Yi et al., 2025). Against this backdrop, the CAL will improve significantly, which alleviates farmers' concerns about power abuse, strengthens their trust in cadres, and thereby contributes to the improvement of CFR.

Based on the above analysis, the following hypothesis is proposed.

H3. CAL mediates the relationship between PVC and CFR.

Under traditional part-time arrangements, cadres often had to balance agricultural production or other jobs with governance responsibilities, leading to the marginalization of governance work and fragmented handling of village affairs, which severely undermined the continuity and efficiency of policy implementation. Farmers often lacked timely access to village cadres when issues arose, resulting in unstable channels of communication and interaction in CFR. After the implementation of PVC, cadres can devote more time and energy to organizing and advancing village affairs, thereby reducing the inefficiencies caused by multiple concurrent roles and enhancing the efficiency and stability of village administration. The improvement in execution efficiency also allows farmers to perceive more directly the tangible outcomes of public affairs management, such as better living environments, improved infrastructure, enhanced public services, and collective economic development. These governance outcomes not only improve farmers' living standards but also strengthen their trust and
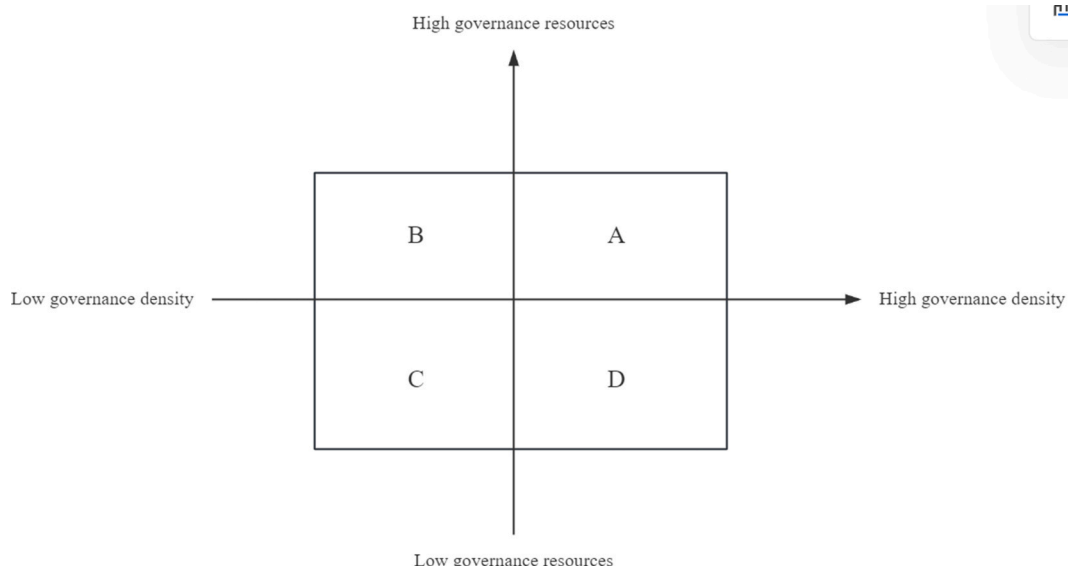
Fig. 2. Village typology based on governance density and governance resources.

recognition of cadres, thereby further fostering positive development in CFR.

Based on the above analysis, the following hypothesis is proposed.

H4. EVAI mediates the relationship between PVC and CFR.

3. Material and methods

3.1. Data sources

Research data in this study comes from the 2022 Agricultural Micro-economic Survey Database of the Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences, which includes both village-level and household-level data. The survey covers 10 provinces (or municipalities), including Zhejiang, Jiangsu, Fujian, Hubei, Anhui, Jilin, Heilongjiang, Chongqing, Yunnan, and Sichuan (Fig. 3). We randomly selected three counties (or districts) in each province (or municipality) by stratified random sampling method and three towns in each county and three administrative villages in each town, and randomly surveyed 20 respondents in each village. All the surveys were conducted by face-to-face interviews, and each interview lasted at least 2 h. The village-level survey covers various information about the sampled villages, including basic information, economic development, village governance, social development, and ecological construction. The household-level questionnaire mainly covers family characteristics, income and expenditure, household participation in village governance, and satisfaction with governance. After filtering out the samples with missing key variables, 249 village-level samples and 5050 household-level samples were valid for our research.

3.2. Variable selection

3.2.1. Dependent variable

CFR is an important manifestation of the "Actual results" dimension within the IAD framework and serves as one of the core dependent variables in this study, reflecting the specific impact of village cadre professionalization on grassroots governance performance. However, the existing literature has not reached a consensus on how to measure CFR. Representative studies, such as Zhang et al. (2020) and Liu et al. (2024), primarily measure CFR in terms of farmers' trust in village cadres, the frequency of cadres' assistance to farmers, and the frequency of cadre–farmer interactions. Jian et al. (2024) further incorporated farmers' subjective evaluation of the performance of village cadres into the analytical scope of CFR. In addition, some studies examine CFR through farmers' subjective assessments of cadre behavior, employing perceptual indicators such as "whether cadres respect farmers' opinions" (respect), "whether farmers trust cadres" (trust), and "whether cadres act fairly and transparently" (justice), to capture farmers' perceptions and sentiments regarding CFR (Cao et al., 2020).

Despite differences in measurement dimensions, most scholars tend to conceptualize CFR along two dimensions: relationship and interaction. Accordingly, this study follows the same logic and constructs a measurement framework for CFR. For the relationship dimension, two indicators are employed: first, the degree of farmers' trust in village cadres. Trust, as a key component of social capital, reflects farmers' overall recognition of cadres' integrity and competence, and serves as a fundamental prerequisite for the stability and sustainability of CFR. Second, farmers' subjective evaluation of cadres' performance, expressed as satisfaction with the quality and effectiveness of public services provided, which reflects cadres' sense of governance responsibility and execution capacity. For the interaction dimension, two aspects are considered: first, the degree of cadre–farmer communication. Communication is a crucial mechanism for information exchange
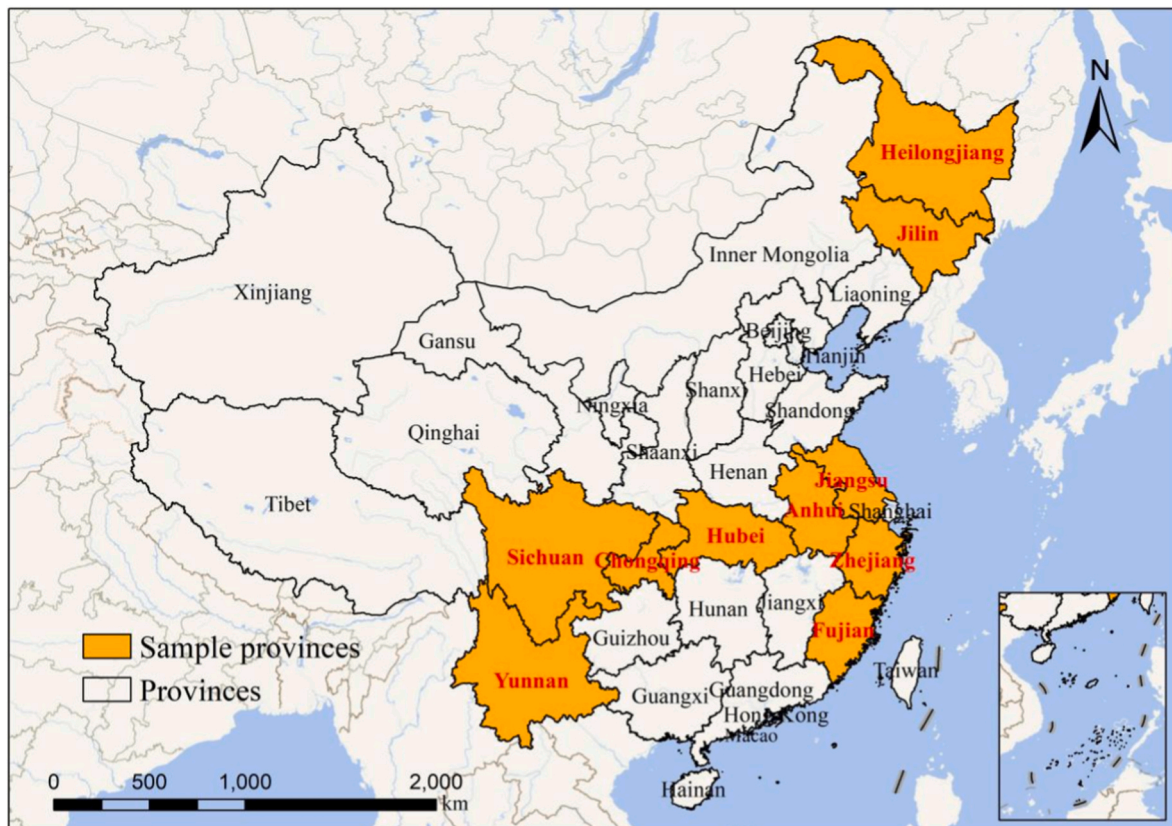

Fig. 3. Study areas.

and emotional bonding. Its frequency and quality significantly influence farmers' understanding and trust in cadres' behavior, help mitigate conflicts and reduce misunderstandings, and constitute a vital link for maintaining sound CFR. Second, farmers' enthusiasm for participating in public affairs. This indicator reflects farmers' sense of agency and willingness to cooperate in village governance. Active participation not only signals farmers' recognition of cadres' organizational and mobilization capacity but also embodies a mutually beneficial and collaborative state between cadres and farmers. The specific indicators are presented in Table 1. Following Zhang et al. (2020), factor analysis was employed to construct a composite index of CFR. As shown in Table 1, the KMO value is 0.770, and the Cronbach's α is 0.764, indicating that the data exhibit acceptable validity and reliability, making them qualified for factor analysis.

3.2.2. Core explanatory variables

Research on PVC has a long history, but few studies have systematically analyzed it from a quantitative perspective. This study, based on existing literature (Zhang, 2020) and available data, aims to measure the professionalization of village cadres across four dimensions: job formalization (JF), management standardization (MS), promotion institutionalization (PI), and sustainable development (SD). We measured these dimension variables by the following indicators: "Whether village cadres are on a sitting system?"; "Has the checklist management system been implemented?"; "whether village cadres have promotion opportunities?"; and "whether the higher-level government provides social insurance for the village Party secretary?" On this basis, the general value of PVC in each sample village is calculated by summing the scores of the four indicators. A higher total score indicates a higher level of PVC. The details are shown in Table 2.

3.2.3. Mediating variables

The mediating variables in this study include the extent to which cadres act legally (CAL) and the efficiency of village affairs implementation (EVAI). *Consistent with* the IAD framework, both CAL and EVAI can be seen as key reflections of the "Interactive mode" dimension, as they capture the behavioral patterns and operational efficiency of village cadres in the institutional setting. Specifically, CAL is represented by farmers' subjective evaluation of the extent to which cadres act legally. EVAI is measured by farmers' subjective assessment of the degree to which the results of the village consultation process are implemented. The details are shown in Table 2.

3.2.4. Control variables

According to the IAD analytical framework, CFR is jointly influenced by multiple external factors, including natural geographical features, socio-economic conditions, and institutional arrangements. To account for these potential confounding factors, this study further disaggregates the "socio-economic condition" within the external institutional

Table 1
Factor analysis of CFR.

Variable	Variable Interpretation	KMO	Cronbach's α
CFR	The degree of trust in village cadres. Very distrustful = 1, distrustful = 2, fair = 3, trustful = 4, very trustful = 5 How would you evaluate the overall performance of village cadres? Very poor = 1, poor = 2, fair = 3, good = 4, very good = 5 The degree of communication between village cadres and farmers? Very poor = 1, poor = 2, fair = 3, good = 4, very good = 5 In 2022, how often did you participate in public affairs? Never = 1,1–2 times = 2, 3–4 times = 3, 4–5 times = 4, More than 5 times = 5	0.770	0.764

Table 2
Summary statistics of selected variables.

Dimensions	Variables	Code values	Mean	SD
Dependent variable	CFR	Based on factor analysis	0.000	1.000
Explanatory variables	PVC	Summary of the following four sub-indicators	1.803	1.019
	JF	Whether village cadres on a sitting system? Yes = 1, No = 0	0.530	0.500
	MS	Has the checklist management system been implemented? Yes = 1, No = 0	0.602	0.490
	PI	Whether village cadres have promotion opportunities? Yes = 1, No = 0	0.133	0.340
	SD	Whether the higher-level government provide social insurance for the village Party secretary? Yes = 1, No = 0	0.538	0.500
Mechanism variables	CAL	To what extent do you agree that village cadres act legally? 1 = strongly disagree; 2 = disagree; 3 = Fair; 4 = agree; 5 = strongly agree.	4.196	0.821
	EVAI	The degree of implementation of the results of the village consultation process. Not implemented at all = 1, few implemented = 2, half implemented = 3, most implemented = 4, all implemented = 5	4.249	0.822
Control variables	V_dis	The county-village distance (km)	29.654	30.620
	V_fra	Number of natural villages	8.510	10.120
	V_dpi	Disposable income per capita of villages	19234.070	8416.830
	V_col	Village collective operating income	470755.870	1498829.570
	V_pop	Population of villages	2700.610	1730.290
	S_age	Age of village branch secretaries	48.130	7.680
	S_edu	Educational level of village branch secretaries. Illiteracy = 1, Primary school = 2, Junior high school = 3, High school and secondary school = 4, University (college) and above = 5	3.430	0.770
	S_sal	Average monthly salary of village branch secretaries	3901.710	2019.630
	H_gen	Gender of head of household	0.870	0.340

Table 2 (*continued*)

Dimensions	Variables	Code values	Mean	SD
	H_age	Age of head of household	56.880	10.770
	H_edu	Educational attainment of head of household	2.810	0.880
	H_pol	Political status of head of household	0.230	0.420
	H_mem	Number of family members	3.790	1.770
	H_inc	Are you satisfied with the level of income of your household? Very dissatisfied = 1, not very satisfied = 2, fair = 3, more satisfied = 4, very satisfied = 5	3.500	1.090
	H_cad	Whether there are any village cadres among the family members? Yes = 1, No = 0	0.180	0.390

environment into village characteristics, cadre characteristics, and farmer characteristics. Accordingly, the control variables are categorized into five groups: natural geographical conditions, socio-economic characteristics, cadre characteristics, farmer characteristics, and general institutional rules. Specifically, the natural geographical conditions include the county–village distance (V-dis) and the degree of village dispersion (V-fra). Village characteristics mainly include per capita disposable income (dpi), collective economic income of the village (V-col), and village population size (V-pop). Cadre characteristics include the age of the village secretary (S-age), educational attainment (S-edu), and the average monthly salary of village cadres (S-sal). Farmer characteristics mainly include the gender of the household head (H-gen), age (H-age), educational level (H-edu), political affiliation (H-pol), household income status (H-inc), household size (H-mem), and whether there is a cadre among household members (H-car). Institutional rules include the presence of clan networks (V-cla) and whether the village secretary concurrently serves as the village director (S-sho). The specific meanings of the above indicators and the descriptions of the statistical summary are shown in Table 2.

3.3. Model selection

Considering that PVC is a village-level characteristic, while CFR is derived from households' responses, there is a distinct nested relationship emerges between these two indicators, i.e., a village corresponds to multiple individuals. This often leads to difficulties in meeting the independence assumption of inter-individual random errors, making the estimation results of traditional regression models no longer accurate (Raudenbush and Bryk, 2002). Therefore, this study aims to employ the hierarchical linear model (HLM) proposed by Lindley and Smith (1972) for empirical analysis. HLM is an effective method for analyzing data with a hierarchical structure, which can address the problem of background effects. Compared to the traditional linear regression model, HLM offers more advantages in terms of parameter estimation methods and algorithms, model assumptions, and data requirements (Goldstein, 1986; Longford, 1987). In addition, studies have highlighted that multilevel models can effectively integrate both subjective and objective data, addressing issues such as endogeneity, common method bias, and the "ecological fallacy" (Diez-Roux, 1998; Robinson, 2009). This study aims to construct an HLM that incorporates influencing factors at both the village and household levels and conducts the multilevel analysis using HLM 8.1 software.

3.3.1. Null model

The null model is the simplest model, without any explanatory variables, and serves as the foundation of HLM. It uses variance analysis to decompose the total variance into within-group variance, dominated by individual households, and between-group variance, dominated by villages. This decomposition helps to determine whether there are significant village-level differences in CFR. The null model is specified as follows:

$$L1 : Y_{ij} = \beta_{0j} + r_{ij} \tag{1}$$

$$L2 : \beta_{0j} = \gamma_{00} + \mu_{0j} \tag{2}$$

The intraclass correlation coefficient (ICC) quantifies the degree of homogeneity of the outcome within clusters representing the proportion of the between-cluster variation $\sigma_{\mu0}^2$ (the between-village variation of the CFR) in the total variation. The ICC value range (0, 1). For example, assuming that ICC = 0.2, it indicates that 20 % heterogeneity in CFR comes from village heterogeneity. The formula for calculating ICC is as follows:

$$ICC = \frac{\sigma_{\mu0}^2}{\sigma_{\mu0}^2 + \sigma_e^2} \tag{3}$$

Typically, if the ICC exceeds the commonly used threshold of 0.059 (citation needed), the use of a hierarchical linear regression model is deemed more appropriate for empirical analysis (Cohen, 1988).

3.3.2. Full model

The full model not only explains the influence of first-level variables on the dependent variable but also reveals the influence and mechanisms of second-level variables on the dependent variable. Therefore, this study constructs a full model to comprehensively examine the effects of household- and village-level factors on CFR. The full model is expressed as follows:

$$L1 : Y_{ij} = \beta_{0j} + \sum_{p=1}^{P} \beta_{pj} X_{pij} + r_{ij} \tag{4}$$

$$L2 : \beta_{0j} = \gamma_{00} + \sum_{q=1}^{Q} \gamma_{0q} Z_{qj} + \mu_{0j} \tag{5}$$

$$\text{Full model} : Y_{ij} = \beta_{0j} + \sum_{p=1}^{P} \beta_{pj} X_{pij} + \sum_{q=1}^{Q} \gamma_{0q} Z_{qj} + r_{ij} + \mu_{0j} \tag{6}$$

In equations (1)–(6), L1 represents the household level, and L2 represents the village level. Y_{ij} is the dependent variable, indicating the evaluation of CFR by the *j*-th household in the *i*-th village. β_{0j} denotes the average evaluation of CFR for all households in the *i*-th village, while γ_{00} represents the overall mean evaluation of CFR across all villages. r_{ij} and μ_{0j} are the random errors at the L1 (household) and L2 (village) levels, respectively, with $\sigma_{\mu0}^2$ and σ_e^2 representing their variances. X_{ij} and Z_j are the first and second level influencing factors respectively.

4. Results and analysis

4.1. Estimated results of the null model

The null model is primarily used to determine whether a hierarchical structure exists in the CFR, that is, whether the CFR is affected by village-level factors. This study uses the aforementioned method to construct the null model, and the estimated results are presented in Table 3. As shown in Table 3, the intra-group and inter-group variances were 0.177 and 0.602, respectively. According to Equation (3), the ICC can be calculated as 0.227, which exceeds the critical value of 0.059.

Table 3
Final estimation of variance components.

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value
INTRCPT1, u0	0.421	0.177	249	1432.185	0.000
level-1, r	0.776	0.602			

Therefore, the hierarchical effect between different levels cannot be ignored, and hierarchical linear analysis is essential.

4.2. Estimated results of the full model

The full model results are presented in Table 4. Models 1 and 2 report the effects of PVC and its sub-components on CFR, respectively. The regression results indicate that PVC has a generally significant positive effect on CFR. H1 is supported. Upon examining the sub-components, *JF* and MS have a significant positive effect on CFR, while PI and SD show insignificant negative effects. Possible explanations are as follows: First, the implementation of a fixed office system provides villagers with a predictable service model and communication channel, allowing them to locate village cadres and receive timely services when needed, thereby enhancing the responsiveness of rural governance. Regular working hours also help village cadres organize and plan daily governance activities more effectively, thus improving overall governance efficiency. Second, the checklist system clarifies the services and responsibilities of village cadres, preventing the arbitrary exercise of public authority and improving service standardization, which in turn increases villagers' trust in cadres. Additionally, the checklist system allows farmers to articulate their needs and expectations more clearly, reducing misunderstandings and dissatisfaction arising from a lack of understanding of village cadres' roles and functions. Third, while theoretically, the promotion mechanism should incentivize village secretaries' work enthusiasm, in practice, some village cadres may prioritize short-term, high-impact projects to secure promotions, thereby neglecting long-term rural development and public welfare needs. This

may lead to inefficient resource utilization and foster formalism. Furthermore, the promotion mechanism may lead village cadres to focus on groups or activities that enhance their political achievements, potentially overlooking the needs of marginalized groups, thereby exacerbating inequality within villages and undermining the social foundation of CFR. Under the "one-shoulder pole" system, village secretaries often become the primary candidates for promotion, leaving other village committee members with limited opportunities, thereby challenging team collaboration among village cadres. Although the negative impacts of the promotion mechanism have not yet passed statistical significance tests, caution is warranted to address potential issues, such as bureaucratization, excessive formalities, and disconnection from grassroots realities. Fourth, providing social insurance for village cadres is a significant welfare measure, but it does not necessarily lead to direct improvements in CFR. This may be because, in many villages, only village secretaries benefit from this policy, while other members of the village committee are excluded, thus limiting its ability to boost the team's overall motivation and cohesion. Additionally, regional fiscal capacity differences result in varying proportions of government-subsidized social insurance premiums. According to field research, in some regions, village secretaries still bear over 50% of the insurance costs, thus diminishing the policy's incentive effect to some extent.

Regarding the control variables, taking Regression 1 as an example, several factors significantly positively affect CFR, including S_sal, V_dpi, V_col, H_edu, H_pol, H_inc and H_cad. Conversely, factors such as V_pop, V_fra, and H_age significantly negatively affect CFR.

4.3. Mechanism testing

Based on the theoretical analysis presented earlier, PVC affects CFR by influencing CAL and EVAI. Drawing from Jiang's (2022) revised "two-step" mediation model, equations (7)–(9) are established to verify the specific mechanisms through which PVC impacts CFR.

$$L1 : M_{ij} = \beta_{0j} + \sum_{p=1}^{P} \beta_{pj} X_{pij} + r_{ij} \tag{7}$$

$$L2 : \beta_{0j} = \gamma_{00} + \sum_{q=1}^{Q} \gamma_{0q} Z_{qj} + \mu_{0j} \tag{8}$$

$$\text{Full model} : M_{ij} = \beta_{0j} + \sum_{p=1}^{P} \beta_{pj} X_{pij} + \sum_{q=1}^{Q} \gamma_{0q} Z_{qj} + r_{ij} + \mu_{0j} \tag{9}$$

where M_{ij} are mechanism variables and the meanings of the other variables are consistent with equations (1)–(6).

First, we examine whether PVC affects CFR through CAL. As shown in Table 5, the coefficient of PVC in Model 1 is significantly positive, and the signs and significance of its sub-components are consistent with the baseline regression, indicating that PVC promotes CAL. Next, we investigate whether PVC affects CFR through EVAI. The estimated coefficient of PVC in Model 2 is significantly positive, suggesting that PVC promotes EVAI. These empirical results support hypotheses H3 and H4.

Table 4
Results of the full model.

Variable	Mode1 1 Coefficients	Mode1 1 S E	Mode2 Coefficients	Mode2 S E
Village level(L2)				
PVC	0.119***	0.028		
JF			0.239***	0.057
MS			0.177***	0.057
PI			−0.070	0.093
SD			0.036	0.064
S_age	0.003	0.004	0.002	0.004
S_edu	0.049	0.043	0.057	0.043
S_sho	−0.035	0.114	−0.011	0.104
S_sal	0.129***	0.058	0.124***	0.057
V_dpi	0.121*	0.064	0.139*	0.076
V_col	0.042*	0.022	0.047**	0.022
V_pop	−0.125***	0.047	−0.136***	0.046
V_fra	−0.005*	0.003	−0.005*	0.003
V_dis	0.000	0.001	0.000	0.001
V_cla	−0.003*	0.002	−0.003*	0.002
Households level(L1)				
H_gen	−0.037	0.032	−0.036*	0.031
H_age	−0.004***	0.001	−0.004***	0.001
H_edu	0.036**	0.014	0.036**	0.014
H_pol	0.108***	0.025	0.107***	0.025
H_mem	0.005	0.007	0.006	0.007
H_inc	0.069***	0.014	0.069***	0.014
H_cad	0.152***	0.031	0.152***	0.031
INTRCPT1	−1.005***	0.057	−1.029***	0.057
ICC	0.186		0.179	
N(L1)	5050		5050	
N(L2)	249		249	

Table 5
Mechanism test results.

Variable	Mode1 1 (CAL) Coefficients	Mode1 1 (CAL) S E	Mode1 2(EVAI) Coefficients	Mode1 2(EVAI) S E
PVC	0.048**	0.023	0.093***	0.029
Other variables	Yes		Yes	
ICC	0.111		0.163	
N(L1)	5050		5050	
N(L2)	249		249	

4.4. Heterogeneity analysis

Based on the theoretical analysis, we classify sample villages into four types along two dimensions: governance density and governance resources. For governance density, we follow the logic of household dependency ratios (Ding et al., 2024) and construct a cadre burden index, measured as the ratio of total village population to the number of village committee members. A higher index indicates that each cadre serves more villagers, reflecting higher governance density, whereas a lower index suggests a lighter governance load and thus lower density. Villages above the sample median are categorized as high-density, and those below as low-density. For governance resources, we adopt per capita GDP at the county (city, district) level as a proxy, since it reflects fiscal capacity, the robustness of public service systems, and the accessibility of policy resources. Villages in counties with above-median per capita GDP are classified as high-resource villages, while those below are categorized as low-resource.

The results (Table 6) reveal that PVC exerts the most significant positive impact on CFR in high-density–high-resource villages (Type A Villages), followed by low-density–high-resource villages (Type B Villages). By contrast, its effects in low-density–low-resource villages (Type C Villages) and high-density–low-resource villages (Type D Villages)) are not statistically significant. Several explanations can be offered. First, Type A villages combine heavy governance demands with adequate resource support, thus meeting both the theoretical necessity and the material preconditions for professionalization to translate into governance performance, which in turn strengthens CFR. Second, although Type B villages show some improvement in CFR, the relatively light governance load weakens the theoretical necessity of PVC. Forced implementation in such contexts may lead to inefficient allocation of governance resources, fiscal waste, and even formalism. Third, Type C villages are constrained by both low governance demand and insufficient resources. Lacking both internal motivation and external support, PVC struggles to break the low-level equilibrium, resulting in limited effects on CFR. Finally, although Type D villages face a relatively high governance burden and theoretically have a demand for PVC, the shortage of resources constrains both the incentive foundation and operational support for policy implementation, making it difficult to achieve substantive effects in practice and thus failing to improve CFR.

4.5. Robustness tests

To test the reliability of the results, we conduct robustness tests by replacing the core explanatory variable, adjusting the regression sample, and changing regression models.

4.5.1. Replacing the core explanatory variable

PVC often implies that village cadres need to dedicate more time and effort to village management and services. Therefore, this study uses the village secretary's commitment to village affairs (measured as the proportion of weekly time spent on village affairs: days per week/7) as an alternative variable for PVC in the regression analysis. The results (see Table 7, Model 1) show that the village cadres' commitment to village

Table 6
Results of heterogeneity analysis.

Variable	Mode1 1	Mode1 2	Mode1 3	Mode1 4
	Type A villages	Type B villages	Type C villages	Type D villages
PVC	0.222***	0.117**	−0.013	0.093
	(0.043)	(0.059)	(0.050)	(0.079)
Other variables	Yes	Yes	Yes	Yes
ICC	0.105	0.145	0.119	0.192
N(L1)	1446	1193	1328	1083
N(L2)	71	58	66	54

Table 7
Results of Robustness test.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
village cadres' commitment to village affairs	0.505** (0.250)				
PVC		0.124*** (0.029)		0.111*** (0.029)	
JF			0.259*** (0.060)		0.242*** (0.060)
MS			0.151** (0.059)		0.162*** (0.059)
PI			−0.061 (0.095)		−0.059 (0.096)
SD			0.050 (0.066)		0.015 (0.066)
Other variables	Yes	Yes	Yes	Yes	Yes
ICC	0.194	0.179	0.172	0.188	0.181
N(L1)	5050	3892	3892	4133	4133
N(L2)	249	249	249	249	249

affairs has a positive impact on the effectiveness of rural governance, passing the 5 % significance test, thus confirming the robustness of H1.

4.5.2. Adjusting the regression sample

To mitigate potential biases in responses due to Party membership or household members being village cadres, this study sequentially excludes samples from households where the head is a Party member or where any family member is a village cadre. The results (see Table 7, Model 2 to Model 5) indicate that after excluding these samples, the coefficients and significance levels of PVC and its sub-components remain consistent with the baseline regression, further verifying the reliability of the baseline regression results.

4.5.3. Adjusting the regression models

To further test the robustness of the mediating effects of CAL and EVAI, we employ a mediation analysis approach based on the structural equation model. This method enables the simultaneous estimation of all path parameters in the model, thereby partially addressing the limitations of the traditional three-step method, which often suffers from large standard errors and biased parameter estimates (Iacobucci, 2012). In practice, we apply the medsem command developed by Mehmetoglu (2018) to estimate the parameters of each path. The estimation results (Table 8) show that the p-values from the Delta, Sobel, and Monte Carlo tests are all statistically significant at the 1 % level, confirming the robustness of the mediating effects and supporting Hypotheses H3 and H4.

4.6. Discussion on endogeneity

This study addresses potential endogeneity issues from two main perspectives. First, although characteristics of village cadres, village-level features, and household characteristics are controlled for, the possibility of other omitted variables or unobservable factors causing estimation bias cannot be ruled out. Second, while PVC can improve CFR, improved CFR may also promote PVC. For instance, villages with harmonious CFR are more likely to become models of rural governance, attracting attention and rewards from local governments, such as higher salaries or promotion opportunities for village cadres. This bidirectional causality may lead to a correlation between PVC and the error term, resulting in inconsistent parameter estimates.

To address these issues, this study adopts the approach of Jiraporn et al. (2014) using the average PVC level of other villages within the same township, excluding the village under study, as an instrumental variable (IV) in a two-stage estimation. A valid IV must meet the criteria of relevance, exogeneity, and exclusivity. First, PVC implementation is

Table 8

Results of the mediation effect test based on structural equation modeling.

	CAL			EVAI		
	Delta	Sobel	Monte Carlo	Delta	Sobel	Monte Carlo
Indirect effect (Standardized)	0.043	0.043	0.042	0.075	0.075	0.075
S E	0.011	0.011	0.011	0.010	0.010	0.010
z-value	4.017	4.008	4.001	7.741	7.737	7.751
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Conf. Interval	0.022, 0.063	0.022, 0.063	0.022, 0.063	0.056, 0.094	0.056, 0.094	0.056, 0.094

typically organized at the township level, resulting in a strong correlation between a village's PVC level and the average PVC level of other villages within the same township. Second, the management practices of village cadres in other villages are unlikely to directly influence villagers' evaluation of governance effectiveness in their own village, ensuring the exogeneity of the IV.

The first-stage regression results (Table 9) confirm that the IV has a significant positive effect on PVC, verifying its relevance. Both the Cragg-Donald Wald F statistic and the Kleibergen–Paap Wald F statistic well above the threshold of 10, indicating that the selected IV is not a weak instrument for PVC. The second-stage estimation results show that PVC has a significant positive impact on CFR, demonstrating that the baseline regression results remain robust even after accounting for endogeneity.

5. Discussion

Being at the forefront of rural grassroots work, village cadres serve as a vital link to connect national policy implementation, fulfill villagers' needs, and convey villagers' wishes. Meanwhile, village cadres play an essential role in maintaining rural order, resolving conflicts, providing public services, and ensuring the effective implementation of projects, thereby influencing the CFR. As Wang (2022) found in her survey on farmers' understanding of effective rural governance, many farmers view village cadres as pivotal to effective governance when they act fairly, assist villagers in achieving prosperity, and deliver tangible benefits to the community. PVC, a significant reform in cadre management, has substantially altered village cadres' behavior.

Theoretically, the impact of PVC is multifaceted and sometimes contradictory, leading to long-standing debates in academic circles. It is not difficult to find that most of the current controversies in the academic community are centered on the relationship between administration and autonomy, with the key issue being whether "administration undermines autonomy" or "administration activates autonomy." The former emphasizes the central role and governance potential of villagers, highlighting their democratic rights in rural governance from a legal and autonomous perspective, in line with social-centered theory (Hooks, 1990). The latter underscores the advantages of state administrative power and the insufficiency of villagers' autonomy in the practical operation of rural governance, advocating for state intervention to

address the shortcomings of autonomy, in line with state-centered theory (Skocpol and Finegold, 1982). However, both state-centered and social-centered theories are grounded in the governance dichotomy of "state vs. society," which, to some extent, disconnects the relationship between the state and society (Gilbert and Howe, 1991). In practice, rural governance is a complex systemic process, where both administrative and autonomous elements are indispensable components. They are not opposing forces but rather different faces of grassroots governance within the state system. This is evident from the Chinese government's emphasis on the improvement of the social governance system under the leadership of the Party committee, the responsibility of the government, democratic consultation, social coordination, and public participation, safeguarded by the rule of law and supported by science and technology. As Miao (2020) stated, "Chinese rural governance does not pursue pure autonomy, but rather limited autonomy with deep state intervention. The level of rural autonomy should not be judged solely by its form but by its effectiveness in responding to farmers' needs and adapting to the development demands of rural areas."

This study argues that, in the context of advancing the rural revitalization strategy, it is crucial to recognize both the irreplaceable role of state power in modern nation-building and the significance of social forces in national governance. The key to improving rural governance and achieving modernization lies in fostering a positive interaction between the state and society. In other words, evaluating the practical effects of PVC largely depends on whether it strengthens or weakens the CFR, which is exactly what we are meant to focus on.

Our findings suggest that PVC generally has a positive impact on CFR, aligning with our theoretical expectations. Further analysis reveals that, based on the regression results of various dimensions of PVC, JF and MS have a significantly positive effect on CFR. This result is reasonable, as for villagers, receiving village cadres' timely assistance is a key factor affecting their evaluation of village cadres. The establishment of regular office hours (i.e., a full-time working system) makes it easier to access villager cadres. Additionally, the implementation of a checklist system clarifies the services provided by village cadres, reducing misunderstandings and dissatisfaction stemming from unclear expectations about the roles and functions of the cadres. PI and SD show a negative impact on CFR, which contradicts our expectations. Although these results do not pass the 10% significance test, further investigations are expected. Generally, PI is intended to motivate village cadres, which should have increased their work enthusiasm. However, the increased enthusiasm from village cadres does not necessarily improve CFR. This is because there are multiple principal-agent relationships involved. Village cadres serve as representatives of both national interests and villagers' interests. The PVC process is actually the process of the state strengthening its control over village cadres (Zhao, 2023), as the state finance bears almost all of the income of village cadres, offers social insurance, and even provides promotion opportunities. All these actions reinforce the cadres' role as representatives of national interests. Additionally, based on the rational economic actor assumption, village cadres may be more inclined to invest their limited resources and energy in projects that yield in a short time, which results in ignoring long-term rural development and villagers' needs. This may lead to village cadres prioritizing groups or activities that directly contribute to their political

Table 9

Endogenous processing results.

Variables	First-stage regression		Second-stage regression	
	Coefficients	S E	Coefficients	S E
PVC			0.084***	0.029
Mean value of PVCs of sample villages other than this one within the town	0.637***	0.064		
Other variables	Yes		Yes	
Number	5028		5028	
Cragg-Donald Wald F	2447.488			
Kleibergen-Paap Wald rk F	99.55			
R^2	0.081			

achievements, and neglecting the needs of some marginalized groups. From this perspective, PVC has, to some extent, diminished the role of village cadres as representatives of villagers' interests. Finally, the strengthening of national interests and weakening of villagers' interests resulted in the deterioration of CFR, which is a key concern of many scholars and needs much attention. Similarly, SD is theoretically an important welfare initiative; however, it has not led to a significant improvement in CFR, which deviates from our expectations. One possible reason is that in many villages, only the village Party secretary is eligible for this benefit, while other members of the "two committees" are excluded, making it difficult to effectively stimulate the overall motivation and cohesion of the leadership team. Moreover, due to variations in local fiscal capacity, the proportion of social insurance contributions paid by the government on behalf of village cadres also differs across regions. According to our fieldwork findings, in some regions village cadres are still required to cover more than 50% of their insurance costs, which to some extent diminishes the expected motivational effectiveness of this initiative. In addition, in many regions, village cadres cannot retain their pension insurance coverage after leaving office, facing problems such as interrupted contributions and uncertain benefits, which objectively undermines the incentive effect of SD.

Mechanism analysis reveals that PVC enhances CAL and EVAI, which, in turn, positively affects CFR. This finding aligns well with the theoretical expectations of this study. With the advancement of PVC, the selection of village cadres has become increasingly open and diversified. More and more cadres are now recruited through standardized procedures such as written examinations, interviews, and evaluations. The externality of cadre origins and the institutional nature of the position incline cadres to rely on formal rules rather than interpersonal networks in their governance practices. Meanwhile, the implementation of complementary measures, including the duty roster system and responsibility checklists, has further clarified procedural norms and behavioral boundaries, specifying "what can be done, how it should be done, and who is responsible." This institutionalization effectively reduces the ambiguity stemming from "rule-by-man" practices characterized by unclear responsibilities and legal vacuums. As governance shifts from guanxi logic to rule-based logic, village cadres gradually assume the characteristics of public office holders in the eyes of villagers. Their exercise of power becomes more predictable and subject to supervision, which not only alleviates farmers' concerns over power abuse but also reduces misunderstanding and conflict arising from procedural opacity. As Ye et al. (2023) found, many rural residents perceive fairness in village cadres' handling of affairs as a key indicator of effective governance. Furthermore, the duty roster system improves the presence and responsiveness of village cadres in governance, thereby enhancing the continuity and speed of policy implementation and public service delivery. From the farmers' perspective, the perceived continuity in the form of "someone takes responsibility, matters are handled, and results are delivered" represents a tangible governance efficiency dividend, providing a new entry point for reassessing the capacity and role of village cadres and ultimately reinforcing trust and recognition.

To further examine which types of villages are most suitable for implementing PVC, we conducted a series of heterogeneity analyses. The results show that the positive effect of PVC is most pronounced in villages with both high governance density and high governance resources, followed by villages with low governance density but high governance resources. In contrast, no significant effects were observed in villages with high governance density but low governance resources or those with low governance density and low governance resources.

In summary, this study contributes to the literature in two main respects. Empirically, it provides an evidence-based evaluation of the effects of PVC, thereby addressing ongoing academic debates over whether this policy may undermine CFR. Theoretically, the study advances the theoretical dialogue on state—society relations. Existing research often critiques state-centered approaches, arguing that excessive state expansion may lead to bureaucratic overload (Lenz et al.,

2025), inflate administrative structures, and constrict democratic spaces (Meyerrose, 2024), thereby reinforcing a "strong state–weak society" governance configuration (Park, 2010). Accordingly, this perspective emphasizes the need to mobilize societal forces to compensate for the limits of state capacity—in other words, to strengthen community self-governance as the core mechanism of grassroots governance (Luo et al., 2022; Liu et al., 2022). However, a parallel strand of literature highlights that exclusive reliance on community self-organization is often unsustainable in practice (Börzel and Risse, 2010). Under conditions of rapid social change and growing governance demands, rural communities often suffer from weak organizational foundations, limited resources, and increasingly complex public affairs. In such circumstances, autonomous governance alone may fall short of rising governance expectations, and potentially result in governance inertia, blurred responsibility, or even "ungoverned spaces" (Zheng, 2015). This suggests that an appropriate degree of state involvement remains institutionally indispensable (Mutlu and Yasun, 2025). Against this backdrop, China's PVC provides a new analytical lens for understanding the evolving relationship between the state and society. The institutional innovation embedded in the PVC system demonstrates that forging more integrated and collaborative linkages between state authority and societal forces can make a "strong state–strong society" governance configuration attainable. More specifically, the essence of PVC lies in the emergence of a hybrid role: professionalized village cadres are neither traditional community elites embedded in dense local social networks nor fully developed Weberian bureaucrats operating exclusively through formalized regulations. Instead, they occupy an intermediate position where local embeddedness and bureaucratic formalization coexist. This hybrid structure generates favorable institutional conditions for improving rural governance performance by avoiding the governance inertia associated with purely autonomous arrangements while mitigating the risks of excessive bureaucratization. Equally important, our analysis, based on the JD-R model, reveals that the effectiveness of PVC is highly context-dependent. Its governance benefits are fully activated only when both governance resources and governance density reach relatively high levels. This finding extends the applicability of the JD-R model to the fields of grassroots governance and public administration. It also offers valuable insights for other countries—particularly developing nations undergoing rapid urbanization—seeking to professionalize their frontline governance teams and strengthen rural governance capacity.

However, this study also has limitations. First, we use only four dimensions—JF, MS, PI, and SD—to measure PVC, which is not comprehensive. These indicators do not fully capture the selection, management, evaluation, and incentive processes of PVC. Second, CFR is measured through four dimensions: villagers' trust in village cadres, communication frequency, evaluation of cadre performance, and enthusiasm for public affairs participation. While these indicators reflect the basic contours of cadre-farmer relations, they primarily emphasize villagers' subjective perceptions, and are limited in capturing the behavioral, organizational, and institutional dimensions of CFR. Third, this paper effectively mitigates potential endogeneity risks between PVC and CFR through the instrumental variables approach. However, it still lacks an effective identification strategy for the potential bidirectional causal relationship between the mediating variables (CAL and EVAI) and CFR. Despite conducting robustness checks using Structural Equation Modeling (SEM), such endogeneity issues may not be fully eliminated. Further clarification of the dynamic interactions and causal mechanisms will require more advanced identification strategies and richer data in future research. Finally, this study only examines the impact of PVC on CFR, which does not fully capture the influence of PVC in the whole rural society. Future research on this topic is expected. Despite the limitations, we are confident that this research offers a valuable contribution, both scientifically and practically, especially in studying the effect of PVC from the cadre-farmer relationship perspective. In the future, we will continue to focus on the topic of PVC, exploring its

impact by expanding the survey scope, extending the tracking period, and using more scientific measurement methods.

6. Conclusion and policy implications

The PVC has increasingly become a significant trend in China's grassroots governance. However, considerable academic debate remains concerning its implications. Drawing on 249 village-level surveys and 5050 household questionnaires collected across 10 provinces in 2022, this study employs a HLM to empirically examine the impact of the PVC on CFR, leading to several key findings.

First, PVC demonstrates a significant positive impact on CFR overall. This finding provides a fundamental empirical support for the rationale of PVC and contributes to the academic debate on state-society relations by suggesting that the "state" and "society" are not necessarily antagonistic, but can, under certain institutional arrangements, interact in a complementary manner. At the dimensional level, only JF and MS show statistically significantly improvements in CFR, whereas the effects of PI and SD are insignificant. This may relate to the early stage of system implementation and the limited awareness or access among village cadres to such institutional arrangements. Although designed to incentivize cadre performance, promotion and social security systems still face challenges such as restricted advancement opportunities and insufficient coverage, resulting in a lack of significant motivational effects.

Second, mechanism analysis reveals that PVC influences CFR by enhancing CAL and EVAI. As rural societies evolve and urban-rural factor mobility accelerates, the traditional "acquaintance society" structure is gradually disintegrating, making governance models based on personal ties, face-saving, and informal networks increasingly ineffective. The implementation of PVC aligns with the inherent need for rural governance to transition from a logic of ritual and customs to one based on formal institutional rules.

Third, heterogeneity analysis shows that PVC has the strongest positive effect on CFR in villages with both high governance density and abundant governance resources. Where either element is lacking, the institutional effect is weaker or even negligible. This finding not only clarifies the contextual boundaries of PVC's applicability but also extends the theoretical boundary of the JD-R model. The JD-R model posits that the alignment between job demands and available resources forms the basis for stimulating individual motivation. Our study further argues that such alignment is necessary but not sufficient—only when both governance pressure and resources are at high levels can village cadres' motivation be fully activated, allowing PVC to maximize its governance potential.

Based on these findings, the policy implications suggest that PVC implementation should be tailored to local conditions and needs, avoiding a rigid, one-size-fits-all approach. PVC should be demand-oriented, taking into account both governance resources and governance density. Specifically, in villages with both high governance density and abundant resources, the PVC system should be further optimized by improving incentive mechanisms for full-time cadres and continuously enhancing governance effectiveness. For villages with sufficient governance resources but low governance density, the implementation of PVC should be approached cautiously, as the theoretical conditions for reform are weak. Forced implementation may lead to wasted resources, bureaucratism, and governance detachment. In villages lacking both governance density and resources, a maintenance-oriented governance strategy should be adopted. PVC should not be forcibly promoted to avoid increasing local fiscal burdens and exacerbating formalistic practices. In villages with high governance density but insufficient resources, cadre compensation should be improved through multiple channels to reduce the mismatch between job demands and available resources. Furthermore, it is important to enhance the professionalism and service awareness of village cadres by providing training on professional ethics, improving supervision mechanisms, and

ensuring they prioritize the interests of villagers. Simultaneously, improving the welfare of village cadres and establishing a promotion and assessment system focused on the interests of farmers will help motivate them, while also preventing issues such as rent-seeking, bureaucracy, and detachment from the masses.

CRediT authorship contribution statement

Yuyuan Yi: Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation. **Furong Chen:** Writing – review & editing, Writing – original draft, Visualization, Validation, Investigation. **Caiyan Liu:** Writing – review & editing, Writing – original draft, Investigation. **Yifu Zhao:** Validation, Project administration, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Yifu Zhao reports financial support was provided by Chinese Academy of Agricultural Sciences. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Authors are solely responsible for the content of this publication.

Data availability

Data will be made available on request.

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