What Makes Pairing Assistance Promote Coordinated Regional Development
— Study on the Interaction between Vertical and Horizontal Transfer Payments

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Abstract: *As a vital complement to vertical fiscal transfers from the central government, the paired assistance mechanism, which features horizontal transfer payments, plays a pivotal role in fostering coordinated regional development (CRD) in China. Distinct from the governance logic of vertical transfers, paired assistance instead utilizes a "project-based" operational framework to rectify the strategic behaviors of local governments with respect to taxation and expenditures. By strengthening economic incentives and optimizing fiscal efficiency, and by tightening institutional constraints on the provision of basic public services paired assistance significantly advances regional convergence. Empirical analysis based on China's East-West Paired Assistance policy (2000-2015) shows that such interventions not only narrow regional development disparities but also mitigate the incentive distortions typically associated with vertical transfers. Mechanism analysis further indicates that paired assistance achieves "incentive-compatible aid" by bolstering the fiscal effort of recipient regions, reducing the prevalence of zombie firms, and increasing investment in basic public services. This study provides theoretical and empirical foundations for China's forthcoming round of fiscal and taxation reforms and offers insights into optimizing transfer structures and refining China's intergovernmental fiscal system.*

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1. Introduction

Since the launch of reform and opening-up policy in 1978, China has come to achieve the "twin miracles" of rapid economic growth and long-term social stability. However, this transformative journey has been fraught with persistent and profound regional developmental imbalances that

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constitute a primary bottleneck in the pursuit of common prosperity. Bridging these developmental disparities and fostering CRD is not only a core imperative for "high-quality" development but also an inherent requirement of the Chinese modernization, which pursues common prosperity.

The resolution of this structural paradox necessitates a sophisticated balance between market forces and state intervention: the former to facilitate the fluid and orderly migration of production factors, and the latter to arrest the widening forces of regional divergence. Theoretically, dismantling institutional impediments to population mobility, and thereby achieving "balance through agglomeration" via market-driven means, is a primary pathway toward regional coordination (Lu et al., 2019). Although this paradigm enjoys broad academic and policy consensus, throughout China, and indeed has guided significant progress in practice, institutional maturation is rarely a linear process. Constrained by incentive incompatibility between central and local authorities, the *hukou* (household registration) system remains an intractable institutional bottleneck (Cai, 2023). Moreover, informal institutions, ranging from the deep-seated cultural attachment to one's native soil to the personalized nature of social networks, continue to limit market-led labor mobility in the short term. Consequently, centrally coordinated fiscal transfer payments have emerged as an indispensable instrument for regional redistribution.

As a regional compensatory policy, fiscal transfer payments are designed to guide economic activity to follow population distribution, thereby smoothing interregional fiscal capacity disparities, equalizing access to basic public services, and ultimately fostering CRD. In practice, following the 1994 tax-sharing reform, China's central transfers have been redirected toward the central and western regions and often account for more than 50% of local budgetary outlays and serving as a fiscal lifeline for underdeveloped areas (Liu & Deng, 2024). This raises a critical empirical question: although these preferential transfers have bolstered the fiscal capacity of lagging regions, have they successfully narrowed the gap in regional development? To address this inquiry, one must first scrutinize the efficacy of transfer payments in correcting intergovernmental fiscal imbalances. Indeed, the "equalizing function" of these transfers is the logical prerequisite for their broader socioeconomic impact (Fan & Xie, 2023). Regrettably, the existing literature offers no consensus on whether this foundational condition has been met (Yin et al., 2007). Furthermore, the debate regarding the economic effects of transfer payments remains fractured. Although some scholars acknowledge their merits, others highlight the "perverse incentives" inherent in equalization grants that may inadvertently stifle economic vitality (Ma et al., 2016). Others contend that these transfers achieve equity only at the cost of economic efficiency (Fan & Zhang, 2010). Similarly, the social impact of transfers on public service provision has been underwhelming, characterized by diluted equalization effects and suboptimal policy steering (Ji & Bao, 2019). Not only have these mechanisms failed to incentivize local governments to augment the supply of public goods, but evidence suggests that when subsidies exceed specific thresholds, they may actually precipitate a decline in the level of local services provided (Li & Zhang, 2017). Ultimately, a growing body of scholarship remains skeptical of the power of transfer payments to drive regional convergence. Such literature suggests that these payments have largely failed to mitigate economic disparities and may instead actually have exacerbated them (Ma & Yu, 2003; An & Wu, 2016).

Given such divergent and even negative research findings, unraveling the underlying

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mechanisms behind the mixed efficacy of transfer paymentshas emerged as a question. As a core component of the fiscal system, transfer payments do more than merely bridge the fiscal gaps of underdeveloped regions; they establish the rules of the game and the incentive mechanisms that govern intergovernmental relations, thereby determining economic performance by shaping local government behavior. Particularly within the context of "Chinese-style decentralization," transfers operate in an environment of intense interjurisdictional competition. This incentivizes local governments to allocate fiscal resources strategically in order to manage the dual pressures of capital (driven by tax-base mobility) and fiscal revenue competition (induced by the transfer system itself), which ultimately impacts institutional efficiency. Consequently, exploring the incentive structures of transfer payments is essential to decoding their policy outcomes.

Theoretically, a well-designed transfer system allows the central government to incentivize local authorities to be more "proactively developmental" (Weingast, 2009). This is achieved by enabling them to correct behavioral distortions arising from disparate initial endowments and to identify misallocations in public service provision (Allers, 2012), thereby moving toward Tiebout efficiency. However, in a hyper-competitive environment, the optimal fiscal decisions of local governments become endogenous to the transfer mechanism (Koethenbuerger, 2011),[1] affecting resource allocation through strategic taxation and expenditure (Hindriks et al., 2008). Specifically regarding revenue, transfers can induce a "tax substitution" effect that fosters fiscal dependency and suppresses local fiscal effort (Qiao, 2006) by weakening competitive taxing behavior (Buettner, 2006). Although this may mitigate the "race to the bottom" in intergovernmental tax competition, the "punishing the fast runner" nature of allocation designs further diminishes marginal incentives for economic development. Regarding expenditures, transfers decouple local revenue generation from the marginal cost of spending. Although the "flypaper effect" may stimulate an expansion of total fiscal outlays and public goods supply (Oates, 1999), the "common pool" effect creates cost externalities that weaken internal incentives for expenditure efficiency. This invites opportunistic behavior, which leads to distortions such as inefficient subsidies (Fan & Wang, 2019). In a "competition for growth" framework, transfers also encourage local governments to favor "production-oriented" over "service-oriented" spending (Fu & Shen, 2012). In summary, the distorted incentive architecture of transfers not only undermines their ability to narrow regional gaps but may also lead to path dependency, resulting in long-term adverse effects on regional development.

Given the preceding analysis, the imperative to "get the incentives right" emerges as the linchpin for enhancing the efficiency of fiscal transfers and catalyzing conordinated development. Crucially, the Chinese fiscal landscape features not only vertical transfers but also a distinctively Chinese mechanism: horizontal fiscal transfers between local governments, most notably through "paired assistance". As a vital institutional complement, paired assistance plays a pivotal role in fostering CRD, and this raises several fundamental questions. What is the nature of the interaction

[1] In other words, if the magnitude of transfer payments is exogenously determined and decoupled from local government performance, such transfers would fail to exert any additional incentive effects on local authorities, let alone alter the cost-benefit calculus of their existing competitive strategies.

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between vertical and horizontal transfers? Does paired assistance suffer from the same incentive misalignments that plague vertical mechanisms? Conversely, can horizontal interventions ameliorate the distortions inherent in the vertical system, and through what specific channels do they facilitate regional convergence? Regrettably, these inquiries remain under-explored. Existing research has focused primarily on the conceptual genealogy of paired assistance or empirical evaluations of its economic outcomes (Xu, 2023). There is a conspicuous dearth of literature that analyzes its incentive effects, and even fewer studies dissect the interactive dynamics between horizontal and vertical fiscal flows. Investigating these questions is essential not only for evaluating the institutional efficiency of paired assistance but also for providing the theoretical and empirical scaffolding necessary to optimize the fiscal structure and refine the intergovernmental fiscal system.

In light of this, the present study explores the unique incentive mechanisms of paired assistance, distinct from those of vertical transfers, utilizing a difference-in-differences (DID) model to identify its impact on regional coordination. This study seeks to provide three key contributions to the literature. First, expanding the Scholarship on Fiscal Incentives: By analyzing the interplay between vertical and horizontal transfers, this study positions paired assistance as a horizontal "institutional pivot" capable of redressing existing distortions, thereby offering insights for refining the transfer payment system as a component of China's governance paradigm. Second, identifying Micro-mechanisms through Quasi-natural Experiments: Utilizing China's East-West Poverty Alleviation Collaboration as a quasi-natural experiment, we rigorously evaluate policy effects and probe micro-level mechanisms, specifically regarding local fiscal effort and expenditure structures, and thus offering deeper insight into this hallmark of Chinese governance. Third, providing Alternative Policy Instruments for Fiscal Reform: In a context in which market mechanisms are hampered by institutional friction and vertical transfers are weakened by incentive distortions, this study presents horizontal transfers as a potent tool for China's next phase of tax and fiscal reform, and systematically elucidates the Chinese institutional framework for balanced development.

2. Institutional Background and Theoretical Analysis

2.1 Institutional Background

Paired assistance is a quintessential practice for translating the institutional advantages of socialism with Chinese characteristics into effective governance. As the adage goes, "To those who share a common goal, no mountain is too far". Paired assistance is a distinctive fruit borne of the leadership of the Communist Party of China and the nation-building experience within a unitary state—key elements of the socialist system with Chinese characteristics.

The seeds of this system were sown in the 1950s during the nascent stages of communist construction. Guided by the principle of "the whole country acting as one chessboard", the slogan "paired assistance and total responsibility" emerged as urban factories aided people's communes in agricultural modernization. By the mid-1960s, China launched the "Third Front" construction, a massive inland migration of industrial capacity designed to rebalance coastal and interior economic layouts for national defense amidst escalating international tensions. The central

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government explicitly mandated that the Third Front rely on the established industrial bases of the First and Second Fronts for manpower, capital, and technology. Although specific "one-to-one" pairings were not yet formalized, this nationwide practice of mutual aid established the embryonic framework of the modern paired assistance system.

Following the initiation of reform and opening-up in 1978, China's central leadership pivoted toward a doctrine centered on economic construction. Within this strategic shift, paired assistance was formally institutionalized and aggressively expanded. A landmark moment occurred in 1979 when the central government endorsed a report by then-Vice-Premier Ulanhu from the National Border Defense Work Conference. This directive mandated that economically advanced eastern provinces provide targeted assistance to underdeveloped border and ethnic minority regions, thus establishing the first explicit "pairing" arrangements. Consequently, paired assistance transitioned from an *ad hoc* practice to a cornerstone of national policy, formally integrating horizontal fiscal transfers into the national architecture. With the deepening of market economy reform, the "Two Overall Situations" strategy —originally articulated by Deng Xiaoping, chief architect of China's reform, as prioritizing coastal development before shifting to support inland regions — gradually transitioned from "prioritizing coastal development" to "leveraging coastal strengths to assist inland development". Against this backdrop, paired assistance was continuously advanced and, supported by a series of policy measures, became a key instrument for narrowing regional disparities and promoting CRD. This shift from "coastal priority" to "coordinated development" was also marked by legislative milestones such as the 1994 *National "Eight-Seven" Poverty Alleviation Plan*, so named for its goal of lifting 80 million people out of poverty over seven years, and the 1996 *Report on Poverty Alleviation Collaboration*, which launched an era of large-scale, structured interregional cooperation.

The year 2008 in particular represented a paradigm shift in the governance of paired assistance. The issuance of the *Guiding Opinions on East-West Poverty Alleviation Collaboration* ("*Guiding Opinions*") propelled the system toward standardization and institutional maturity. Crucially, this document introduced a "project-based system" for selection and management and, for the first time, established a formal performance evaluation mechanism. Although pre-2008 assistance relied primarily on the administrative accountability of a hierarchical bureaucracy, the post-2008 era introduced a sophisticated framework of incentives and constraints. This shift toward project-based and assessment-led governance fundamentally altered the incentive landscape for local governments and served as a catalyst for institutional efficiency and the consolidation of interregional ties.

In the new era, China has continuously refined and expanded its paired assistance system to address the "principal contradiction" of unbalanced and inadequate development, positioning it as a cornerstone of regional coordination. In 2015, for example, the Central Committee of the Communist Party of China (CPC) and the State Council issued the *Decision on Winning the Battle Against Poverty*, which further refined the East-West poverty alleviation collaboration framework. This momentum was galvanized in 2016 when General Secretary Xi Jinping personally chaired a high-level symposium to advance East-West cooperation and paired assistance initiatives. Subsequently, the *Guiding Opinions* was released, which explicitly positioned paired assistance

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as a "grand strategy, [a], comprehensive arrangement, and [a] decisive undertaking" for fostering regional coordination and achieving common prosperity for the Chinese people. As the poverty eradication campaign entered its critical, decisive phase, these institutional arrangements proved pivotal. Following the comprehensive victory in the battle against absolute poverty in 2020, China's paired assistance has evolved in tandem with shifting national priorities, transitioning seamlessly into the Rural Revitalization strategy to ensure the continuity and sustainability of developmental gains.

The genesis, formalization, and deepening of paired assistance have mirrored China's evolving socioeconomic priorities, vividly illustrating the unique characteristics of its governance model. This institutional evolution has provided a natural laboratory for probing incentive mechanisms and identifying policy outcomes. Accordingly, this study utilizes the 2008 institutional reform as a quasi-natural experiment by selecting the 2000-2015 period as a research window[2] in which to isolate the causal effects of paired assistance on coordinated development.

2.2 Theoretical Analysis

As a horizontal institutional nexus, paired assistance operates under a governance logic that is fundamentally distinct from the vertical transfer paradigm. Answering the question of whether this horizontal framework can dismantle the incentive shackles of vertical transfers and function as "incentive-compatible aid" for CRD or inadvertently constructing a new "incentive trap" requires the formulation of a fresh theoretical narrative. The exploration of fiscal incentives remains a cornerstone of second-generation fiscal federalism. Notably, scholarship on horizontal systems, such as Germany's Länderfinanzausgleich, has expanded the role of transfers in internalizing externalities within tax and expenditure environments (Egger et al., 2010). These insights provide a robust comparative baseline for analyzing how paired assistance departs from vertical norms. Accordingly, this study dissects the incentive effects of paired assistance across two primary dimensions: taxation and expenditure.

2.2.1 Taxation

The impact of paired assistance on the tax behavior of local governments is channeled through two main avenues: tax effort and tax competition. With respect to refining tax effort, paired assistance serves to decouple local governance from fiscal dependency, thereby rectifying distortions in fiscal effort and sharpening the marginal incentives for economic growth. Moreover the specificity of the project system matters. Paired assistance is anchored in a "Project-Based System" since it adheres to the principle that "projects dictate funding, and funding follows

[2] Notably, we conclude our primary observation window in 2015 to prevent the empirical results from being confounded by the unprecedented intensity of interventions post-2016. According to data from the former State Council Leading Group Office of Poverty Alleviation and Development, the financial scale of East-West assistance escalated dramatically during this period. Although average annual funding remained at a relatively stable 437.82 million yuan between 2003 and 2015, it surged to 2.926 billion yuan in 2016 following the high-level policy shift initiated by General Secretary Xi Jinping, eventually reaching a peak of 17.761 billion yuan in 2018 at the height of the Targeted Poverty Alleviation Campaign. This forty-fold increase underscores the necessity of the 2000-2015 window for a clean identification of the 2008 reform's structural effects, isolated from the statistical "noise" of subsequent massive capital infusions.

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projects", with capital strictly siloed in dedicated accounts for specific uses. This stands in sharp contrast to vertical special-purpose transfers, in which local governments often "bundle" to serve broader regional strategic plans, a process that frequently blurs the administrative control of specific project lines. The singular, "precision-drip" nature of paired assistance projects prevents these funds from being subsumed into the recipient government's general revenue pool. By blocking the substitution of transfers for local tax revenue, the system effectively mitigates fiscal dependency and restores the recipient's drive for independent fiscal effort. Additionally, unlike equalization transfers, which often suffer from a "punishing the fast runner" design where higher local effort results in lower central support, paired assistance is a top-down political mandate issued under the authority of a unitary state. The pairing arrangements and the scale of support are exogenously determined by the central government and are not tied to the recipient's economic "effort". This exogenous nature corrects the negative incentives for development that are often inherent in the vertical system.

Paired assistance also reconfigures horizontal rivalry, steering local governments away from "race-to-the-bottom" tax competition and toward "race-to-the-top" expenditure competition. Furthermore, although the project-based nature of paired assistance discourages fiscal dependency, it also encourages local governments to strengthen horizontal competition to bolster fiscal revenue in order to meet existing administrative and expenditure responsibilities. However, the policy's emphasis on public goods enables a strategic pivot: providing high-quality public services becomes a substitute for tax-base competition driven by preferential rates or tax incentives. This expenditure-led competition is reinforced by an embedded performance evaluation mechanism. This embedded performance evaluation mechanism, coupling strict outcome assessments with discretionary implementation authority, creates a high-powered incentive environment that drives both donor and recipient governments to proactively pursue optimal project selection and meticulous management, thereby fostering a race to the top in public service provision. Admittedly, rent-seeking competition for central grants, vividly described as "running to ministries for funds", remains a significant form of fiscal competition in China. The matching fund requirements of these vertical projects often exacerbate fiscal strain on underdeveloped regions and can trigger a "shell construction" impulse, where local governments invest in superficial or underutilized infrastructure purely to capture higher-level subsidies rather than to meet actual local needs. Compared to the expenditure competition fostered by paired assistance, however, the competition for vertical special transfers is far more likely to result in an "incentive trap" characterized by inefficient capital allocation and mounting local debt.

2.2.2 Expenditure

The impact of paired assistance on local government expenditure can be observed through two lenses: expenditure efficiency and expenditure bias. With respect to enhancing expenditure efficiency, paired assistance serves as a structural safeguard against fiscal distortions, significantly improving the allocative efficiency of public funds. The "Project-Based System" functions through meticulous target management and stringent process controls, effectively "hardening" budget constraints. This mechanism curbs both the capacity and the propensity for reckless

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fiscal expansion in recipient jurisdictions. Moreover, it circumvents the information asymmetry and the "long-arm" oversight dilemma typical of central special-purpose transfers, in which the principal-agent chain is often too attenuated to prevent opportunistic, inefficient allocations. Paired assistance bridges the structural rupture between local revenue benefits and the marginal cost of spending often found in vertical systems as well. Although equalization transfers are frequently secured through "strategic posturing of weakness" and special-purpose transfers tend to favor "demonstrated strength", the centrally coordinated "capability-to-need" matching mechanism in paired assistance ensures a far more precise alignment with actual local requirements. By compelling recipient governments to internalize the external costs associated with "common pool" funds, the system restores the intrinsic incentives for spending efficiency and restrains expenditure distortions.

Paired assistance is instrumental in correcting the strategic preference for production-oriented spending, thereby elevating the equalization of basic public services and rectifying expenditure bias. Theoretically, the equalization of public service provision is constrained not so much by fiscal gaps as by a lack of institutional incentives for public service investment. Even with substantial central infusions, lagging regions often fail to provide adequate public goods due to the inherent positive externalities (spillovers) of social spending and the "competition for growth" evaluation environment, both of which drive local governments toward productivity-biased spending. Paired assistance breaks this deadlock by utilizing its project-based framework to impose "strong constraints" on "weak incentive" domains, mandating that funds be channeled toward public goods. Unlike the fragmented "contracting and bundling" mechanisms seen in vertical special-purpose transfers, paired assistance unifies authority over fund allocation and management throughout the project lifecycle. This ensures that public service initiatives are implemented without being diluted by bureaucratic layers. Furthermore, its logic of "tailored, graduated adaptation" prevents the mismatch inherent in top-down systems, in which the "logic of public interest" often produces standardized, homogeneous public goods that fail to meet heterogeneous local demands.

In summary, paired assistance leverages its project-based operational logic to correct incentive distortions in both the taxation and expenditure domains of recipient governments. By sharpening the marginal incentives for economic development, enhancing fiscal efficiency, and promoting the equalization of basic public services, it functions as a potent catalyst for the coordinated development.

3. Empirical Strategy and Data

3.1 Identification Strategy

Building upon the theoretical framework established above, we contend that paired assistance not only serves as a catalyst for the coordinated development but also functions as a corrective mechanism for the incentive distortions inherent in vertical transfer payments system. To isolate these policy effects rigorously, we specify the following baseline empirical model:

$$Y_{it}=\beta_0+\beta_1 Tran_{it}+\beta_2 Tran_{it}\times Aid_{it}+\beta_3 Aid_{it}+\Gamma Controls_{it}+\varepsilon_{it} \quad (1)$$

In this specification, i denotes the region, and t denotes the year. The dependent variable Y represents the level of CRD, operationalized here as the regional development gap. *Tran* quantifies

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the intensity of vertical transfer payments received from the central government. *Aid* is a binary treatment indicator for the paired assistance policy; with 2008 designated as the year of the policy shock. Recipient regions under the East-West collaboration framework are assigned a value of 1 for the year 2008 and thereafter, and 0 otherwise. *Controls* represents a vector of socio-economic control variables, including region-specific and year-specific fixed effects, respectively. ε is the idiosyncratic error term.

The preceding theoretical analysis indicates that vertical transfers lead to incentive distortions, whereas paired assistance, as a form of horizontal transfer, provides "incentive-compatible aid". Therefore, we expect the coefficient β_1 to be positive and β_3 to be negative. The coefficient of paramount interest is β_2. A significantly negative β_2 would provide empirical validation that paired assistance effectively ameliorates the incentive misalignments associated with vertical fiscal flows.

Due to the lack of granular data for municipal and county-level transfer payments post-2009, Model (1) is restricted to provincial-level identification. To estimate the marginal effects of the paired assistance policy at the county level, we specify the following model:

$$Y_{it}=\lambda_0+\lambda_1 Aid_{it}+\Gamma Controls_{it}+\varepsilon_{it} \quad (2)$$

here, λ_1 captures the marginal impact of paired assistance on regional development disparities, with an expected negative sign. The definitions for the key variables are as follows.

3.1.1 Coordinated regional development

CRD is not a quest for "uniformity" in aggregate economic scale, but rather "equilibrium" in per capita terms, ensuring that living standards are broadly commensurate across regions. Consequently, we measure the degree of coordination using the per capita economic development gap. Provincial Level (*Gap_province*): measured as the ratio of the average per capita GDP of the eastern region to the per capita GDP of the specific province. County Level (*Gap_county*): measured as the ratio of the per capita GDP of the provincial capital's urban districts to the per capita GDP of the specific county.

3.1.2 Intensity of central vertical transfer payments

Following the methodology of Fan & Zhang (2010), the intensity of vertical transfers (*Tran*) is defined as the net central subsidy revenue (central subsidies minus local remittances) scaled by the local government's total fiscal expenditure. This formulation effectively filters out "noise" from national debt and government fund-managed revenues that might otherwise obscure the true fiscal gap.

3.1.3 Control variables

To account for potential confounding factors from other assistance policies and ensure the robustness of the causal inference, the following controls are included. Population Scale (*People*): the natural logarithm of the total population at year-end. Investment Rate (*Invest*): the ratio of total fixed-asset investment to GDP. Government Size (*Gov*): the ratio of general budgetary expenditure to GDP. Industrial Structure (*Inds*): the share of the secondary industry's value-added as a percentage of GDP.

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3.2 Data Sources and Descriptive Statistics

The economic and fiscal datasets utilized in this study are synthesized from the *China Regional Economic Statistical Yearbook*, the *China County Statistical Yearbook*, and the *China Finance Yearbook*. To eliminate inflationary bias and ensure longitudinal comparability, all nominal variables were deflated using provincial GDP deflators, anchored to a 2000 base year. For the firm-level micro-analysis, data for the 2000-2013 period were extracted from the Chinese Industrial Enterprise Database. Following the rigorous data-cleaning protocols established by Cai et al. (2009), we excluded observations with missing core indicators (total assets, gross industrial output, or fixed assets) or those exhibiting accounting anomalies, such as total assets being less than current assets or profit margins exceeding 100%. To mitigate the influence of extreme outliers, all micro-level variables were winsorized at the 1st and 99th percentiles. Table 1 provides the descriptive statistics, which primarily focuses on the provincial-level regional development gap (*Gap_province*) and vertical transfer intensity (*Tran*), alongside the statistical characteristics of the county-level variables.

TABLE 1. Descriptive Statistics of Major Variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Gap_province	288	2.479	0.805	0.970	5.581
Tran	288	0.590	0.098	0.350	0.918
Gap_county	11 307	4.382	2.930	0.188	25.100
People	15 889	3.138	1.042	0.000	5.299
Invest	15 000	0.624	0.575	0.003	13.366
Gov	15 957	0.295	0.292	0.009	3.739
Inds	15 913	0.378	0.176	0.000	2.277

3.3 Treatment and Control Groups

The delineation of treatment and control groups is informed by the *Report on Organizing Poverty Alleviation Collaboration between Economically Developed and Underdeveloped Regions* (State Council Office Document [1996] No. 26) and specific provincial mandates regarding the assistance of subordinate counties. The former serves as the basis for assessing provincial-level impacts, and the latter facilitates a granular examination of county-level effects. The specific sample distributions are as follows.

As illustrated in Figure 1, this study considers two categories of treatment and control groups.[3] Based on Model (1), the provincial-level treatment group consists of 10 recipient provinces in central and western China, and the control group comprises 8 nonrecipient provinces in the same regions. Based on Model (2), the county-level treatment group consists of 354 recipient counties. To ensure the robustness of our results, the control group is further subdivided into three

[3] Note that to exclude major external interference, we have excluded Tibet and Xinjiang from our sample of central and western provinces. Both regions were subject to massive, specialized national assistance programs, specifically the "18-Province Paired Assistance to Tibet" (initiated in 1994) and the "19-Province Paired Assistance to Xinjiang" (re-launched in 2010). The sheer magnitude and unique political nature of these interventions would likely confound the effects of the more standardized East-West collaboration policies analyzed herein.

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categories: (i) 715 nonrecipient counties across western provinces; (ii) 219 nonrecipient counties that are geographically adjacent to recipient counties; and (iii) 496 nonrecipient counties that are non-adjacent. The rationale for this granular subdivision is that adjacent counties typically share more similar cultural, natural, and socio-economic trends with the recipient counties than nonadjacent ones. Consequently, utilizing adjacent nonrecipient counties as a control group allows for a "cleaner" identification of the paired assistance effect. However, recognizing that assistance projects may generate spillover effects, particularly in adjacent areas with tight economic linkages, we further employ nonadjacent nonrecipient counties as a supplementary control group to ensure the empirical validity of our findings.

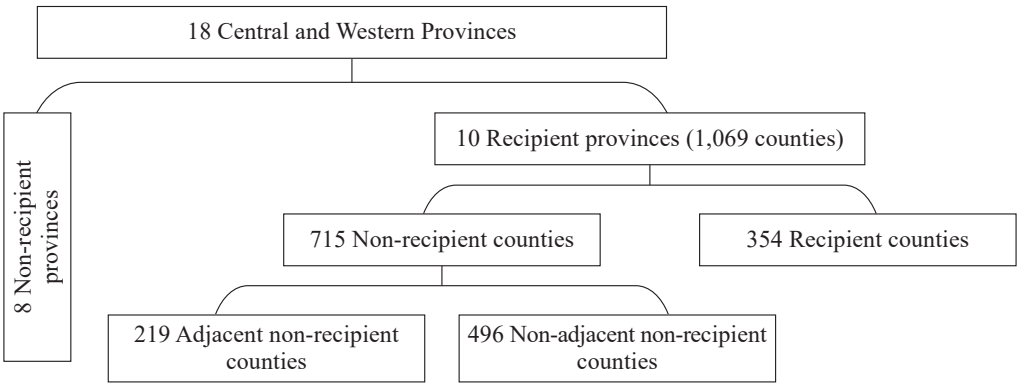

Fig.1. Sample Distribution of Treatment and Control Groups

4. Empirical Results

4.1 Baseline Regressions

We begin by evaluating the impact of vertical transfer payments on regional economic disparities using provincial-level data. Column (1) of Table 2 presents the results for regional coordination at the provincial level. After controlling for covariates such as population size and the scale of government expenditure, the coefficient for vertical transfer payments is 1.749 ($p < 0.01$). This finding aligns with the prevailing skepticism in the recent literature: far from moderating regional disparities, vertical transfers appear to have failed in their regulatory role and have, to some extent, exacerbated the economic chasm.

TABLE 2. Baseline Regression Results

Variable	(1)	(2)	(3)	(4)	(5)
	Gap_province		*Gap_county*		
$Tran_{it}$	1.749*** (0.001)	1.441*** (0.001)			
$Tran_{it} \times Aid_{it}$		-0.666*** (0.033)			
Aid_{it}		-0.397*** (0.000)	-0.568*** (0.000)	-0.988*** (0.000)	-0.441*** (0.001)

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TABLE 2 Continued

Variable	(1)	(2)	(3)	(4)	(5)
	Gap_province		*Gap_county*		
$People_{it}$	4.005*** (0.000)	3.856*** (0.000)	0.426 (0.173)	0.360 (0.266)	0.475 (0.285)
Gov_{it}	-0.551 (0.192)	1.135*** (0.009)	0.591** (0.028)	1.663*** (0.000)	0.605** (0.030)
Ind_{it}	-2.071*** (0.000)	-1.778*** (0.000)	-3.914*** (0.000)	-3.023*** (0.000)	-4.366*** (0.000)
$Invest_{it}$	0.413** (0.027)	0.012 (0.944)	-0.410*** (0.000)	-0.457*** (0.000)	-0.426*** (0.000)
Constant	-30.346*** (0.001)	-29.089*** (0.000)	4.807*** (0.000)	4.737*** (0.000)	5.005*** (0.001)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	288	288	10 348	6 100	8 360
R-squared	0.935	0.947	0.871	0.869	0.868

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. p-value are in parentheses.

Next, we isolate the marginal effect of paired assistance on regional coordination. As shown in Column (2), the interaction term between vertical transfers and paired assistance is significantly negative at the 1% level. This suggests that for provinces not integrated into the East-West collaboration framework, the policy not only narrows the development gap but also serves as a structural corrective, partially neutralizing the incentive distortions inherent in the vertical system and thereby validating our theoretical analysis.

We further utilize county-level data to identify the marginal effects of paired assistance. Column (3), which uses the 354 assisted counties as the treatment group and the remaining 715 nonassisted counties in central and western provinces as the control group, shows that paired assistance significantly narrows the economic gap between assisted counties and their provincial capital districts. When the control group is refined to the 219 adjacent nonassisted counties in Column (4), the coefficient for paired assistance is -0.988. Compared to Column (3), the effect is notably stronger. This may reflect the fact that adjacent counties share more similar geographic and cultural endowments, improving comparability and allowing for a more locally credible identification of the policy's impact, despite potential spillover effects. Finally, Column (5) utilizes the 496 nonadjacent nonassisted counties as the control group, and the results remain significantly negative, further reinforcing the robustness of our baseline findings.

4.2 Robustness Checks

4.2.1 Parallel trends test

The internal validity of our DID estimation hinges on the "parallel trends" assumption, that treatment and control groups shared a common trajectory prior to the policy intervention. We utilize an event-study approach to test this. Specifically, using 2008 as the baseline year, we

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construct a series of dummy variables for the periods before and after the reform to examine trend differences in regional economic convergence while maintaining all control variables.

Figures 2 and 3 illustrate the results for the provincial and county samples, respectively. As shown, prior to 2008, the coefficients for the assistance dummies are not significantly different from zero, confirming that the treatment and control groups followed identical economic convergence trends before the institutional shift. Post-2008, the coefficients become significantly negative and display a sustained downward trend. This temporal divergence provides strong evidence that the 2008 paired assistance reform effectively reduced regional development gaps and promoted coordinated growth.

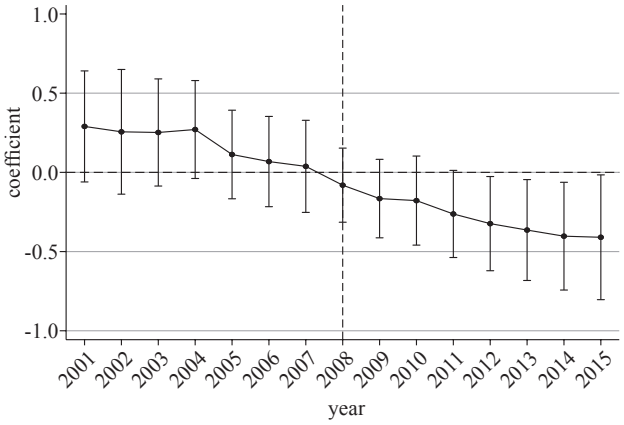

Fig. 2. Parallel Trends Test: Provincial Sample

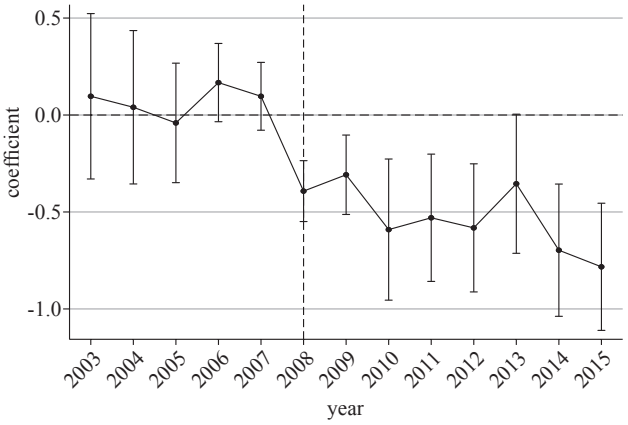

Fig. 3. Parallel Trends Test: County Sample

4.2.2 Placebo test

To exclude the potential interference of other concurrent policy shocks and to more robustly verify the policy effects of paired assistance, we conducted a placebo test by randomly assigning treatment status to 354 counties. Due to the limited sample size at the provincial level, consisting of only 10 treatment and 8 control units, random sampling was not performed for the provincial data. Figure 4 illustrates the kernel density distribution of the estimated coefficients generated from 500 random sampling repetitions of the baseline regression.

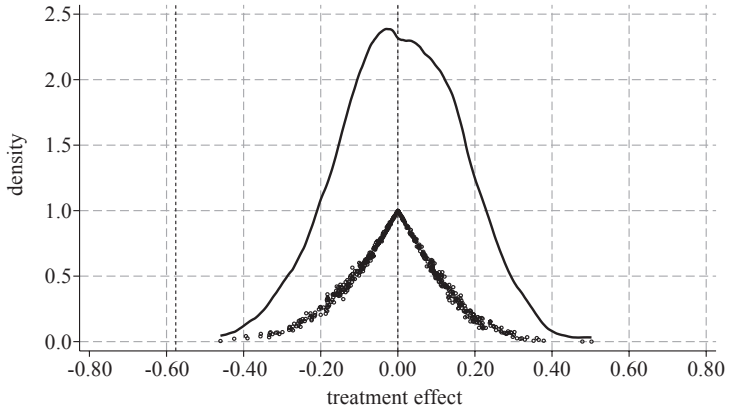

Fig. 4. Placebo Test

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These results indicate that the mean of the estimated coefficients for the "pseudo" paired assistance policy is concentrated near zero, with the actual baseline regression coefficient situated at the extreme lower tail of the kernel density function. This evidence further excludes the influence of other policy factors outside the scope of East-West paired assistance.

4.2.3 Exclusion of competing explanations

A key challenge in identifying the causal effect of East-West paired assistance is the potential confounding influence of other major national support programs that overlapped during our sample period, such as massive post-disaster reconstruction initiatives and targeted poverty alleviation campaigns. These programs were often characterized by greater funding intensity and broader coverage. To ensure our results are not merely capturing the effects of these overlapping policies, we implement two rigorous robustness checks. First, we address the potential confounding effects of major disaster relief. The 2008 Wenchuan earthquake and the 2010 Yushu earthquake triggered massive nationwide mobilizations. For Wenchuan alone, the central government organized a paired assistance plan that involved 18 provinces that invested a total of 80.507 billion yuan. Because these disaster-related flows occurred alongside our policy window and targeted similar regions, they could exert a competing influence on our estimates. To decouple these effects, we exclude samples from heavily affected provinces (such as Sichuan and Qinghai) for a four-year window starting from the disaster year.[4] Second, we explicitly control for the National Poverty Alleviation and Development status. By including an indicator for whether a county was designated as a "national key poverty-stricken county" by the former State Council Leading Group Office of Poverty Alleviation and Development, we account for the persistent, vertical subsidies provided to these areas. As shown in Table 3, the coefficient for East-West paired assistance remains negative even after excluding these competing explanations, indicating that its impact on regional convergence is independent of disaster relief and traditional poverty grants.

TABLE 3. Exclusion of Competing Explanations

Variable	(1)	(2)	(4)	(5)	(6)
	Gap_province		*Gap_county*		
$Tran_{it}$	1.788*** (0.001)	1.408*** (0.001)			
$Tran_{it} \times Aid_{it}$		-0.676** (0.044)			
Aid_{it}		-0.402*** (0.000)	-0.553*** (0.000)	-0.988*** (0.000)	-0.433*** (0.001)
Control group	Nonrecipient provinces		Nonrecipient counties	Adjacent nonrecipient counties	Nonadjacent, nonrecipient counties
$Controls_{it}$	Yes	Yes	Yes	Yes	Yes
N	280	280	10 121	5 912	8 172
R-squared	0.935	0.947	0.873	0.871	0.870

[4] The *Overall Planning for Post-Wenchuan Earthquake Restoration and Reconstruction and the Overall Planning for Post-Yushu Earthquake Restoration and Reconstruction*, both issued by the State Council, explicitly established the strategic objective of "completing the primary tasks of restoration and reconstruction within three years". On this basis, this study excludes samples from the four-year period following the onset of the disaster (including the year the disaster occurred) to account for the heightened intensity of relief interventions during the reconstruction phase.

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5. Mechanism Analysis

Prevailing scholarship on the mechanisms of paired assistance has predominantly underscored the role of state intervention in steering factor mobility and activating market-driven convergence (Zhang et al., 2023). Although unfettered factor mobility may theoretically foster an endogenous closing of regional economic disparities, this convergence decelerates markedly when regional capital and labor stocks substantially exceed steady-state levels (Kleinman et al., 2023). Furthermore, government-directed capital flows often fail to involve a genuine transfer of ownership (An & Wu, 2016), and institutional rigidities in labor mobility remain a formidable, "hard-to-conquer" obstacle. Collectively, these structural frictions inevitably retard, and may even obstruct, the attainment of coordinated development. In such a constrained environment, "getting the incentives right" assumes greater urgency than merely "getting the prices right". Building on our theoretical framework, this section empirically tests whether paired assistance functions as "incentive-compatible aid" by ameliorating distortions in the taxation and expenditure behavior of recipient governments.

5.1 Taxation

Our theoretical analysis suggests that paired assistance mitigates fiscal dependency, rectifies the degree of local fiscal effort, corrects negative incentives for economic development, and regulates inter-jurisdictional tax competition. Within these pathways, the correction of development incentives is reflected both in the convergence trends of economic disparities (as seen in the baseline results) and in tax effort, a metric for a local government's proactive agency. Although the shift toward expenditure competition is primarily measured by improvements in basic public services, we first focus on the taxation channel. Consequently, we utilize tax effort as a primary indicator of incentive improvement.

Specifically, we adopt the "tax handle" approach by utilizing the actual tax-to-GDP ratio (*Tax*) as the dependent variable. We use per capita GDP as the proxy for the quantity of the tax base, and trade openness (total imports and exports/GDP), the shares of the primary and secondary industries, and population size are used to measure the quality of the tax base. We estimate the Tax Capacity (*Ability*) of each local government by regressing {the quantity and quality of the tax base} on {the actual tax-to-GDP ratio} and then define Tax Effort as the ratio of actual tax revenue to this estimated capacity (Effort=Tax/Ability). This metric is then incorporated into our baseline model (1) for mechanism testing.

TABLE 4. Mechanism Analysis: Tax Effort and Fiscal Expenditure Efficiency

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Tax effort		Fiscal expenditure efficiency			
	effort		*zom_firm1*		*zom_firm2*	
$Tran_{it}$	-2.262** (0.027)	-2.947*** (0.007)	3.889*** (0.000)	3.946*** (0.000)	4.214*** (0.000)	4.430*** (0.000)
$Tran_{it} \times Aid_{it}$		5.279*** (0.000)		-1.537** (0.016)		-1.931*** (0.001)

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TABLE 4 Continued

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Tax effort		Fiscal expenditure efficiency			
	effort		*zom_firm1*		*zom_firm2*	
Aid_{it}		0.604*** (0.000)		-0.487*** (0.000)		-0.399*** (0.000)
$Controls_{it}$	Yes	Yes	Yes	Yes	Yes	Yes
N	288	288	37 112	37 112	39 783	39 783
R-squared	0.911	0.920				
Adjusted R-squared			0.333	0.335	0.299	0.301

Columns (1) and (2) of Table 4 report the results of the mechanism test for tax effort. The coefficient for vertical transfer payments is significantly negative, indicating that vertical transfers exert a substitution effect on local taxation, significantly suppressing the tax effort of local governments. Conversely, the regression coefficients for the interaction term (*Tran* × *Aid*) and the standalone paired assistance variable (*Aid*) are both significantly positive. This shows that the East-West paired assistance policy effectively enhances local fiscal effort and corrects the fiscal dependency induced by vertical transfers, thereby providing "incentive-compatible aid" at the taxation level.

5.2 Expenditure

The above theoretical analysis posits that paired assistance rectifies the intrinsic incentives for fiscal expenditure efficiency, inhibits the opportunistic behavior of recipient governments in inefficiently allocating funds, and increases the propensity for expenditure on basic public services. The testing of the expenditure-side mechanism thus primarily involves the two dimensions: expenditure efficiency and expenditure bias.

5.2.1 Expenditure efficiency

We use the firm-level zombification rate to measure fiscal expenditure efficiency. The rationale is that the cost externalities associated with the "common-pool effect" of transfers weaken the intrinsic incentives for expenditure efficiency, leading to inefficient subsidies that subsequently foster the emergence of "zombie firms". Answering the question of whether paired assistance, as a form of horizontal transfer, can internalize the external costs of "common-pool funds" and thereby rectify fiscal expenditure distortions is the key to identifying its role in improving expenditure efficiency. To this end, using data from the Chinese Industrial Enterprise Database (2000-2013), we construct the following Logit model for regression analysis:

$$zom_firm_{ivt}=\alpha_0+\alpha_1 Tran_{it}+\alpha_2 Tran_{it}\times Aid_{it}+\alpha_3 Aid_{it}+\Gamma Controls_{ivt}+\varepsilon_{ivt} \quad (3)$$

In our empirical specification, the subscripts *i*, *v*, and *t* denote the province, the firm, and the year, respectively. The dependent variable, Zom_firm_{ivt}, is a binary indicator of zombie firm status. Following the methodology of Shen (2016), a firm is identified as a "zombie" if it simultaneously satisfies three criteria: (i) an asset-liability ratio exceeding 50%, (ii) negative actual profits, and (iii)

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a year-on-year increase in total liabilities. Actual profits are operationalized in two ways to ensure robustness: *zom_firm1*: Total profit minus subsidy income, used to eliminate the interference of direct fiscal support on firm profitability. *zom_firm2*: Further deducting nonoperating income from the above, thereby precluding the possibility of firms achieving positive profits through tax rebates or other nonrecurring gains and losses. The specifications for $Tran_{it}$ and Aid_{it} remain consistent with the baseline model (1), with the interaction term $Tran_{it} \times Aid_{it}$ capturing the marginal effect of paired assistance on rectifying fiscal expenditure efficiency. $Controls_{ivt}$ represents a vector of firm-level and provincial-level variables. Firm-level controls include firm size (log of total assets), leverage (total liabilities/total assets), profitability (total profit/total assets), and capital intensity (fixed assets/total assets). Consistent with the baseline, the sample targets firms in central and western provinces; furthermore, following Sheng & Liu (2016), we focus on firms that were in continuous operation throughout the 2000-2013 period.

The regression results for Model (3) are reported in Columns (3)-(6) of Table 4. Columns (3) and (5) demonstrate that the coefficients for vertical transfers are positive, suggesting that vertical transfers induce distortions in local government expenditure that significantly increase the probability of firm zombification. Conversely, Columns (4) and (6) reveal that the coefficients for both the interaction term and the paired assistance dummy are negative. This indicates that paired assistance not only reduces the likelihood of firm zombification but also ameliorates the expenditure distortions caused by vertical transfers, providing "incentive-compatible aid" to enhance fiscal expenditure efficiency.

5.2.2 Fiscal expenditure bias

Following the research of Fu & Shen (2012), we utilize local per capita public service expenditure (*bps*) to characterize the basic public service expenditure bias of local governments. Specifically, per capita public service expenditure comprises the per capita amounts of three fiscal categories: education (*edu*), healthcare (*medical*), and social security and employment (*social*). All variables are incorporated into the baseline model (1) in their natural logarithmic form. Furthermore, considering the impact of regional economic levels on basic public service provision, we control for provincial per capita GDP; all other variables remain consistent with baseline model (1).

These regression results are presented in Table 5. The coefficients of vertical transfers on overall public services, education, and social security are not statistically different from 0, but healthcare expenditure exhibits a negative effect. Given that the central government has explicitly prioritized basic public services in recent years through both general and special-purpose transfers, these results corroborate the presence of "weak incentives" and "soft budget constraints" inherent in the vertical transfer regime. In contrast, the interaction term between vertical transfers and paired assistance is positive for overall public service and education expenditures. This shows that paired assistance effectively hardens budget constraints and partially rectifies the expenditure bias associated with vertical transfers, thereby serving as "incentive-compatible aid" that elevates the standard of basic public services.

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TABLE 5. Mechanism Analysis: Fiscal Expenditure Bias

Variable	(1)	(2)	(3)	(4)
	bps	*edu*	*medical*	*social*
$Tran_{it}$	-0.036 (0.855)	-0.142 (0.661)	-0.766*** (0.001)	0.339 (0.227)
$Tran_{it} \times Aid_{it}$	0.370** (0.032)	0.407* (0.099)	0.013 (0.954)	0.384 (0.124)
Aid_{it}	0.002 (0.954)	-0.041 (0.267)	0.013 (0.794)	0.051 (0.213)
$Controls_{it}$	Yes	Yes	Yes	Yes
N	279	279	279	279
R-squared	0.991	0.986	0.986	0.979

Note: In 2007, the National Bureau of Statistics (NBS) significantly revised the statistical classification of fiscal expenditures, rendering data prior to and after the adjustment incomparable. Consequently, we have restricted the sample period for this specific analysis to 2007-2015. This adjustment not only leads to a substantial reduction in observations but also limits the pre-reform period to a single year. To test the fiscal expenditure bias mechanism rigorously under these constraints, we have redefined the control group to include all nonrecipient provinces.

6. Concluding Remarks

Narrowing economic disparities and achieving coordinated regional development are central to high-quality development and the pursuit of common prosperity, a core tenet of the Chinese modernization. Attaining this objective requires a dual approach: leveraging market mechanisms to facilitate the orderly flow of production factors while also enhancing the government's role in converging regional gaps. However, current efforts are impeded by a practical dilemma. Market mechanisms remain hindered by short-term institutional barriers, but central vertical transfers are often rendered ineffective by incentive distortions. In this context, "getting the incentives right" has become an urgent imperative. This paper analyzes the interaction between vertical and horizontal transfers to explore how the paired assistance system serves as a policy complement to achieve "incentive-compatible aid" and promote regional coordination.

Our findings indicate that unlike the governance logic of central vertical transfers, paired assistance operates through a "project-based system". By bolstering local fiscal effort, recalibrating intergovernmental competition, enhancing expenditure efficiency, and rectifying expenditure bias, this mechanism improves the strategic taxation and spending behavior of local governments. Our empirical research on the East-West Paired Assistance policy (2000-2015) reveals that the program not only reduced regional development gaps but also ameliorated the negative externalities of vertical transfers, and these results remain robust across various sensitivity tests. Mechanism tests further substantiate the theoretical framework, showing that paired assistance significantly elevates fiscal effort in recipient regions, reduces the probability of firm "zombification", and increases the provision of basic public services. This study thus provides an analytical perspective that interprets "the Chinese system" through the lens of "the efficacy of China's governance and the ingenuity of its policy innovations". Furthermore, it offers theoretical and empirical support for future fiscal and tax reforms, the optimization of transfer payment structures, and the perfection of the transfer payment system. Admittedly, however, it has its limitations. Regarding the measurement of paired

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assistance, we did not utilize actual assistance input for estimation. In practice, paired assistance encompasses not only disclosed financial aid but also substantial implicit expenditures that are difficult to quantify, such as personnel exchanges, technical training, labor collaboration, and intellectual support, which have increasingly become the primary modes of assistance. Accurately estimating actual inputs and identifying the heterogeneous impacts of varying assistance intensities on regional coordination remain vital topics for future research.

Tracing the evolutionary trajectory of China's transfer payment system over the three decades since the 1994 tax-sharing reform reveals a distinct pattern of institutional transformation. While maintaining the established "stock" of institutionalized transfers, the system has incrementally augmented both general-purpose fiscal transfers and earmarked special-purpose transfers to address the widening regional development gap and the misalignment between local fiscal capacity and assigned expenditure responsibilities. The continuous accumulation of these "incremental" transfers has generated structural momentum, precipitating a broader realignment and transformation of the transfer payment framework. However, research into the incentive effects of vertical transfers indicates that general-purpose transfers have not only failed to provide effective economic incentives but have also fostered fiscal dependency and distorted expenditure priorities. Conversely, although earmarked transfers can yield positive economic outcomes, a high proportion of such transfers contradicts the requirements of fiscal decentralization. This study shows that the paired assistance system, a nonformulaic and nonlegalized institution with the characteristics of horizontal transfers, effectively overcomes the incentive biases of general-purpose transfers. It provides "incentive-compatible aid" for the strategic taxation and expenditure behaviors of local governments, serving as a vital supplement for filling fiscal gaps in underdeveloped regions and narrowing economic disparities. However, other hand, it also offers a decentralized governance solution for the centralized allocation of earmarked funds. It not only eliminates the "matching funds" requirements of special-purpose transfers but also prevents local governments from falling into the "incentive traps" caused by competition for such projects. As China orchestrates a new round of fiscal and taxation reforms in an attempt to establish a modern fiscal regime, optimizing the structure and perfecting the system of transfer payments have undoubtedly become central priorities. Therefore, we argue that, adhering to the path-dependent logic of structural evolution, and building upon the "stock" of vertical transfers, fostering and institutionalizing the paired assistance mechanism — a quintessential form of horizontal transfers — represents a promising instrument for "incremental" reform in designing the next generation of fiscal institutions.

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