Equalization through the People’s Republic of China’s Intergovernmental Fiscal System: The Effectiveness of Central and Provincial Transfers

XIAO TAN* AND YING TAN

The People’s Republic of China’s (PRC) fiscal system is characterized by very high expenditure decentralization and heavy reliance on transfers to finance public services. The government’s embrace of inclusiveness and equalization as national goals has raised questions about whether transfers can deliver equalization. This paper seeks to answer this question by analyzing newly available fiscal data compiled from government websites. We find the allocation of central transfers remains strongly region based, resulting in high intra-regional inequality among provinces. Poorer provinces also tend to retain more central transfers at their own (provincial) level. Those provinces with greater pretransfer inequality tend to exert greater equalization efforts, but these are not necessarily proportional to their pretransfer inequality. As a result, some localities are left out of the PRC’s countrywide equalization program. These equalization patterns remained highly persistent during the coronavirus disease shock in 2020. Collectively, the findings highlight that the PRC’s complex intergovernmental fiscal system still poses challenges for equalization.

Keywords: equalization, intergovernmental fiscal system, intergovernmental transfers, People’s Republic of China, regional inequality

JEL codes: E62, H11, H77

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I. Introduction

Since the early 2000s, the Government of the People’s Republic of China (PRC) has adopted a new development paradigm that emphasizes inclusiveness and equalization. Under the banner of creating a “harmonious society,” fiscal spending on public services increased rapidly, and new social safety net programs were introduced (Carrillo and Duckett 2011, Gao 2017). Building on these developments, in 2012 and 2017, the central government issued the first and second national 5-year plans focusing on the construction of a public service system and calling for the equalization of public services by 2020 (State Council 2012, 2017).

The government’s ambitious agenda and rapid rollout of new programs have placed enormous stress on the PRC’s intergovernmental fiscal system (IFS), which stands out globally for its high degree of expenditure decentralization, with subnational governments accounting for 84% of national budgetary expenditures (per 2018 national final accounts data), and delivering almost all public services that touch people’s lives (Ministry of Finance 2018). This contrasts with the situation in members of the Organisation for Economic Co-operation and Development (OECD) and in other transition economies, where the subnational share of national budgetary expenditure sits at around 30%—except in large countries, such as the United States, where it rises to around 50% (Dollar and Hofman 2008).

Significantly, the PRC’s exceptionally high degree of fiscal decentralization on the expenditure side is not mirrored on the revenue side, as subnational governments only contribute about 53% of national budgetary revenues based on the 2018 national final accounts data (Ministry of Finance 2018). Moreover, these subnational governments lack the autonomy to raise their own taxes. The nature of this IFS creates vertical imbalances and makes transfers critical to bridge fiscal gaps at the subnational level. This heavy reliance on transfers—including the associated complexities and inefficiencies—has led to economists’ prescription to radically reform the PRC’s IFS and realign revenue and expenditure assignments (World Bank 2002, Wingender 2018).

Given this context, it is essential to thoroughly examine the effectiveness of transfers in achieving fiscal equalization in the PRC. Despite previous research on this topic (e.g., Wang and Herd 2013; Liu, Martinez-Vazquez, and Wu 2017), there is a need for a new study for two significant reasons. First, prior research on transfers in the PRC has been limited due to data availability constraints. However, since the enactment of the new budget law in 2014, a series of fiscal data transparency reforms have been implemented, mandating all levels of government to disclose their budgets.
and final accounts. This new dataset provides novel opportunities to empirically examine the equalization effects of transfers. Second, considering the PRC’s recent rapid policy advancements, it is crucial to conduct a fresh analysis of the equalization effects of transfers. In addition to the new pressure placed on transfers due to the rapid rollout of new public service programs, the transfer system itself has undergone continuous reforms as a crucial aspect of the budget reform accompanying the adoption of a new budget law in 2014. The primary objective of this transfer reform is to promote the inter-regional equalization of public services (State Council 2014). Over the past decade, the government has made significant efforts to clarify concepts and classifications of transfer types, establish governance rules, increase the share of general transfers, and enhance fiscal transparency (Ministry of Finance 2016a, 2016b; State Council 2016a, 2016b; General Office of the State Council 2018). These developments suggest that substantial changes may have been introduced to alter the equalization pattern of transfers.

Our study aims to leverage the new dataset to address the gap in the existing literature. Specifically, we utilized data from the 2018 and 2020 central and provincial final accounts to construct a self-compiled dataset. This dataset allows us to systematically examine transfer transmission and its equalization effects at both the provincial and subprovincial levels. Through this approach, our study aims to provide an updated analysis of the effectiveness of transfers within the PRC’s complex IFS.

The remainder of this paper is structured as follows. Section II provides background information for this study, including the rationale for fiscal equalization, the PRC’s fiscal equalization efforts, and a summary of research on the relationship between transfers and equalization in the Chinese context. Section III describes the data sources and analytical methods used in this study. Section IV presents the results on the effects of equalization transfers in 2018, starting at the provincial level and then moving to the subprovincial level. This is followed by an additional analysis of 2020 data for comparison with the results based on the 2018 data. Finally, section V concludes and discusses the policy implications.

II. Background

A. Rationales for Fiscal Equalization

Fiscal equalization is a transfer of fiscal resources to subnational governments to enable them to provide similar levels of public services at similar levels of taxation
despite differences in economic development (Blochliger et al. 2007, OECD 2014). The driving force behind equalization is equity—other roles of fiscal equalization (e.g., externalities and support for macroeconomic stabilization) tend to be more contested (Blochliger et al. 2007, Blochliger and Charbit 2008, OECD 2014).

Fiscal equalization can be seen as a natural companion of fiscal decentralization as it aims to correct potential imbalances resulting from subcentral autonomy (Blochliger et al. 2007, OECD 2014). This is because the allocation of expenditure and revenue assignments in a fiscally decentralized system leads to horizontal fiscal imbalances due to the different fiscal capacities and expenditure needs of subnational governments (Martinez-Vazquez and Searle 2007). Without fiscal equalization, these disparities could lead either to fewer services in fiscally poor regions and/or to higher tax rates for similar levels of government services in such regions. Disparities in the level and quality of services may perpetuate inequalities in income levels and undermine a sense of national unity (Hofman and Guerra 2007).

Most OECD countries have introduced some explicit or implicit fiscal arrangement that reduces fiscal disparities across jurisdictions. Fiscal equalization is shaped by the wider institutional framework—such as the size, number, and geographical distribution of subnational governments; the responsibilities and fiscal resources allocated to each jurisdiction; and the mechanics of power-sharing between the central and subcentral levels (Blochliger et al. 2007). Despite its extensive use, fiscal equalization is highly country specific.

B. The People’s Republic of China’s Fiscal Equalization

Scholars in the PRC focusing on the 1980s and 1990s link the high level of fiscal decentralization to unequal spending on public services across localities and the underprovision of public services in poor areas (World Bank 2002, Zhang and Kanbur 2005). This is because, after the 1994 tax reform, the high level of expenditure decentralization was not matched on the revenue side. With limited revenue autonomy, weak local tax bases, and inadequate transfers, many governments in poor areas did not have sufficient resources to fund public services and, as a result, they often fell short of meeting their responsibilities.

In recognition of these problems and backed by a strong fiscal recovery since the 1994 tax reform, in the early 2000s, the central government adopted a new development paradigm that emphasizes inclusiveness and equalization. These public service programs share important commonalities. First, in contrast to the existing social services that tended to be employment linked, the new programs feature broad
coverage. Driven by the expressed wish of “giving back to (the) rural (sector)” under the Hu Jintao–Wen Jiabao administration, several programs began by targeting the rural population, with coverage later expanded to urban nonemployees. As a result of the inclusive coverage, the number of beneficiaries of subsidized government services increased substantially during the 2000s and 2010s. Second, public service policies are now formulated at the top. The central government sets service standards to be achieved, imposes timelines, and specifies the level of government subsidies. Alongside expanding the scope of beneficiaries, the central government has significantly increased both services and standards. The combination of more services, more beneficiaries, and higher standards of provision means that the government has taken on substantial new costs. All these developments have translated into vastly more transfers flowing through the PRC’s IFS.

In the IFS, transfers must cascade down through the administrative hierarchy, involving various intermediaries at the provincial, prefectural, and county government levels in the distribution of central transfers to the end recipients. However, due to data limitations, knowledge about the roles of these subnational governments remains limited. This study intends to speak to this important gap by focusing on provincial governments, which play a key role in transmitting central transfers to lower levels of government (Figure 1). In performing this role, provincial governments are given significant discretion in deciding how revenues and expenditures are shared at the subprovincial level—and provinces have chosen different intergovernmental fiscal arrangements. Since provinces are also one level of government with their own revenues and expenditures, their assigned task may sometimes conflict with their own self-interests. It is thus critical to understand the role of provinces in the transmission of central transfers, which have significant effects on the final equalization outcomes.

Figure 1. Transfers through Provinces

Source: Authors’ illustration.
C. Transfers and Equalization

Transfers have attracted scholarly interest on the central question of whether they are equalizing. Earlier studies have found that the allocation of fiscal resources is not based on economic considerations, and institutional and political factors play significant roles (Yu and Tsui 2005; Shen, Jin, and Zou 2012). Given the PRC’s hierarchically fashioned government structure, Martinez-Vazquez, Qiao, and Zhang (2008) highlight that the effectiveness of equalization policies greatly depends on the degree of vertical decentralization and the equalization efforts of intermediate-level governments. Analyzing 1995–2011 provincial-level data and 1995–2005 county-level data, Liu, Martinez-Vazquez, and Qiao (2014) conclude that despite the equalization efforts, disparities in per capita expenditures remained too high. Better outcomes would require a further increase in the pool of funds dedicated to equalization and explicit rules to ensure more stable and predictable funding. Focusing on government health expenditure, Tan (2017) observed that, although central government transfers had boosted provincial health spending, their marginal impact had waned over time. Recent studies, such as Yan and Reschovsky (2021), paint a more optimistic picture, highlighting substantial reductions in fiscal disparities within certain provinces due to equalization transfers. However, they also uncover some subcategories of equalization transfers with anti-equalizing effects, tempering the overall equalization impact of transfers (Huang and Chen 2012; Shen, Jin, and Zou 2012; Li 2018).

However, scholarly exploration of transfers has been seriously limited by data constraints. Until 2010, the Ministry of Finance published the *National Prefectures, Cities, and Counties Fiscal Statistics* (全国地市县财政统计资料) series on an annual basis. This publication included data on intergovernmental transfers received by local governments and provided the key basis for empirical studies exploring the PRC’s local public finances (e.g., Yu and Tsui 2005; Wang and Herd 2013; Liu, Martinez-Vazquez, and Wu 2017). However, because the Ministry of Finance no longer publishes this series, there has been an absence of empirical exploration of subnational finance at the national scale; as a result, researchers have focused instead on the central–provincial levels (e.g., Huang and Chen 2012), the subprovincial level in a single province (e.g., Li 2018, Yan and Reschovsky 2021), or a single program (e.g., Tan and Wong 2022). This research has benefited from the fiscal transparency rules instituted under the 2014 budget law, requiring governments at all levels to disclose their budgets and final accounts. Further, beginning in 2017, the Ministry of Finance called for local governments at the county level and above to set up online platforms to disclose budgetary information (Ministry of Finance 2016a). Typically, these disclosure rules were implemented hierarchically downward. The central
government disclosed the breakdowns of tax rebates, general transfers, and earmarked transfers by region for the first time in 2016 (State Council 2016c). This was followed by disclosures by provincial governments, with some provinces beginning in the same year (e.g., Guangdong). Using these newly available sources, we have compiled a national dataset that covers data at both the provincial and subprovincial levels (grouped by prefectures). Building on the existing literature and positioning our study in the context of new policy developments, these new data allow us to revisit the question: Are transfers effective in achieving fiscal equalization in the PRC?

Our study is also among the first to examine the relationship between transfers and equalization in the coronavirus disease (COVID-19) context. Due to both the pandemic and the reduction in the value-added tax (Guo and Shi 2021), local governments’ fiscal revenues experienced a slight decline in 2020 (−0.9% compared to the 2019 level), whereas public expenditure continued to rise (+3.4% compared to the 2019 level). To fill the widening revenue–expenditure gap at the local level, the central government made more transfers in 2020 despite the drop in its own revenue (Ministry of Finance 2020). The heightened fiscal pressure meant that provincial governments might have faced a greater conflict of interest in transmitting payments as part of equalizing efforts. The recently available 2020 data thus allow us to test whether the pandemic had any adverse effects on fiscal equalization, enhancing our analysis of the effectiveness of transfers in the PRC’s IFS.

III. Materials and Methods

A. Data Sources

Data for this study were collected from the following publicly available sources:

(i) The central government’s final accounts for 2018 and 2020 provide data on the central government’s transfer payments to provinces and the allocation of different transfer payments across provinces.¹

(ii) China Statistical Yearbook 2019 and China Statistical Yearbook 2021 provide 2018 and 2020 data, respectively, on the population and fiscal revenue of each province.²

¹The central government’s final accounts for 2018 and 2020 can be accessed at http://yss.mof.gov.cn/2018czjs/ and http://yss.mof.gov.cn/2020zyjs/, respectively.

(iii) *Provincial Final Accounts 2018* and *2020* (available on each provincial government’s official website) provide 2018 and 2020 data, respectively, on provincial government transfer payments to subprovincial governments and the allocation of different transfer payments across localities. Since the allocation of provincial transfers to local governments is not reported in all provincial accounts, we also collected additional data from prefectural final accounts (and county final accounts for Jilin in 2020).

(iv) *Provincial Statistical Yearbooks* provide data on the population and fiscal revenue of each prefecture, with some also providing data down to the county level.

Following the Government of the PRC’s approach, we counted three broad types of transfers—tax rebates, general transfers, and earmarked (or specific purpose) transfers—all as transfers. To facilitate the analysis of subprovincial units, we grouped them into prefectures following the Ministry of Civil Affairs’ 2020 definition. After this preliminary data treatment (elaborated in Appendix 1), we constructed a dataset covering all 31 province-level units and 321 out of a total of 328 prefecture-level units (excluding the five cities under separate state planning—Shenzhen, Qingdao, Xiamen, Ningbo, and Dalian) in both 2018 and 2020. The seven missing cases at the prefectural level are Huangnan and Haixi in Qinghai; Tonghua in Jilin; Shaoxing, Jinhua, and Lishui in Zhejiang; and Sansha in Hainan.

**B. Data Analysis**

Our study evaluated the effectiveness of transfers at two administrative levels—the central–provincial and provincial–prefectural levels. At the central–provincial level, we examined the allocative pattern of central transfers and to what extent the central transfers have reduced inequality among the 31 province-level units (section IV.A). At the provincial–prefectural level, we focused only on the 27 province-level units with prefectures to examine (i) the retainment pattern of central transfers at the provincial level (section IV.B), (ii) the allocative pattern of provincial transfers

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3The Ministry of Finance provides direct links to all provincial final accounts at [http://yss.mof.gov.cn/zhuantilanmu/sjyjsgkzl/](http://yss.mof.gov.cn/zhuantilanmu/sjyjsgkzl/).

4We utilized resident population data wherever possible. In cases where resident population data were not available in the statistical yearbooks of certain provinces, we sought data from alternative sources. However, despite our best efforts, we encountered a limitation in obtaining resident population data for the year 2018 in four provinces: Liaoning, Jilin, Heilongjiang, and Xinjiang. The implications of this limitation are discussed in detail in Appendix 1.
(including the central portion), and (iii) to what extent the transfers have reduced inequality at the prefectural level (section IV.C). Our main analysis was based on 2018 data, but additional analysis was made to assess how the identified patterns changed during the COVID-19 shock in 2020 (section IV.D).

1. Measuring the Equalization Effort

This study used the Gini coefficient to quantify the equalizing effort. The Gini coefficient is widely used to measure fiscal disparities (e.g., Blochliger et al. 2007; Liu, Martinez-Vazquez, and Qiao 2014; Liu, Martinez-Vazquez, and Wu 2017; Li 2018) — the higher the Gini coefficient, the greater the fiscal disparities. We then calculated the values of the indicator for the pretransfer and posttransfer fiscal revenues of the provinces and prefectures. The difference between the pre and the posttransfer inequality is regarded as the equalization effect — the larger the ratio, the larger the equalization effort. To account for the great variance in population across provinces and prefectures in the PRC, we weighted the Gini coefficient by population.

2. Decomposing Fiscal Inequality

To further evaluate the Government of the PRC’s equalization effort, we decomposed the inequality of pre and posttransfer fiscal revenues into inter- and intra-regional components at the central–provincial level, and inter- and intra-provincial components at the provincial–subprovincial level. This decomposition approach is widely applied by economists to investigate the PRC’s regional disparities (e.g., Li and Xu 2008; Fan, Kanbur, and Zhang 2011; Liu, Martinez-Vazquez, and Qiao 2014). Since the Gini coefficient is not easily decomposable or additive across groups, we used the best-known entropy measure, Theil’s T index, which allows us to decompose inequality into the part that is due to inequality within areas and the part that is due to differences between areas (World Bank 2005). Again, our analysis was weighted by population.5

3. Correlation Analysis and Descriptive Statistics

To explore the allocative pattern of intergovernmental fiscal transfers, we used correlation and ordinary least squares (OLS) regression analyses. We also used basic descriptive statistics including mean and the coefficient of variation (CV) to

5We applied the ineqdeco command in Stata to make the calculation (Jenkins 1999).
summarize patterns. Such methods are widely used in the social sciences and thus are not elaborated here. For consistency, we applied population weighting in all our analyses throughout the paper.

IV. Results

A. Equalization at the Central–Provincial Level

As Figure 2 shows, the pattern is mixed concerning whether a poorer province—as measured by per capita gross domestic product (GDP)—receives more central transfers. Whereas economically developed provinces and municipalities—including Beijing, Shanghai, Tianjin, Jiangsu, Zhejiang, Fujian, Guangdong, and Shandong—all tend to receive limited central transfers, patterns in the less developed regions are not as clear. Tibet receives exceptionally high central transfers, but relatively poor provinces—such as Anhui, Jiangxi, and Shanxi—do not receive more transfers than the richer provinces, such as Inner Mongolia and Ningxia.

Figure 2. Central and Provincial Transfers, 2018

CNY = Chinese yuan.
Note: Provinces/regions are arranged by per capita gross domestic product.
One significant factor contributing to this ambiguous relationship is the continued use of a region-based allocation metric for transfers by the central government. This metric was initially adopted in the 1990s to address the persistent income disparities among the “east” (coastal), “central,” and “west” regions (Atinc 1997; Li 2006, pp. 186–87; Li and Xu 2008). The approach was further reinforced in a 2018 State Council document that outlines the cost-sharing ratios between the central and local governments for various public services (General Office of the State Council 2018). The current system has undergone a minor modification, with provinces (including five cities with semi-provincial status) now divided into five groups for cost-sharing designations, replacing the previous tripartite division (Table 1). Thus, it is likely that the regional factor plays a significant role in determining the amount of central transfers received by provinces.

### 1. A Regression Analysis on the Allocative Pattern of Central Transfers

To empirically test the aforementioned hypothesis, we employed OLS models incorporating three sets of independent variables. The first set consists of per capita pretransfer fiscal revenue, reflecting the central government’s equalization objective. We anticipated a negative association between the amount of central transfers and a province’s pretransfer fiscal revenue. The second set includes regional dummies, as
previously discussed, which we expected to be significant predictors of central transfers due to the frequent link between the allocation of central transfers and a province’s geographical region. Lastly, the third independent variable is an ethnic minority dummy. We included this variable as ethnic minority areas are frequently singled out for preferential financial policies in government documents, in addition to regional considerations (Liu and Lyu 2020). Specifically, among all provinces, eight regions (Inner Mongolia, Guangxi, Ningxia, Xinjiang, Tibet, Guizhou, Qinghai, and Yunnan) are designated as ethnic minority regions receiving special transfers.

Since an OLS regression is very sensitive to outliers, we excluded Tibet from our models (Figure 2). The number of observations (N) was thus 30. In model (1), we included only pretransfer fiscal revenue (Table 2). The coefficient on pretransfer fiscal revenue was statistically significant at the 1% level, meaning that poorer provinces do receive more central transfers. However, the adjusted R-squared value was only 0.1591, meaning the model explained only 15.9% of the variation in central government transfers.

In model (2), we included only the regional dummy variables (the east region as the reference group). The coefficients of both dummies were statistically significant at the 1% level, which means that provinces in the central and western regions receive significantly more central transfers than eastern provinces. The adjusted R-squared increased from 0.1591 in model (1) to 0.4312 in model (2), suggesting that the regional dummies are better predictors than the pretransfer fiscal revenue of central transfers. In model (3), we included both the pretransfer fiscal revenue and the regional dummies. The pretransfer fiscal revenue was still a significant predictor, but the coefficient was only –0.10. A comparison of the adjusted R-squared between models (2) and (3) indicated little change, meaning that adding the pretransfer fiscal revenue

<table>
<thead>
<tr>
<th></th>
<th>Model (1)</th>
<th>Model (2)</th>
<th>Model (3)</th>
<th>Model (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretransfer revenue</td>
<td>–0.22***</td>
<td>N.A.</td>
<td>–0.10***</td>
<td>–0.10***</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East (ref.)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Central</td>
<td>N.A.</td>
<td>1,507.01***</td>
<td>1,034.40***</td>
<td>1,047.69***</td>
</tr>
<tr>
<td>West</td>
<td>N.A.</td>
<td>4,075.47***</td>
<td>3,626.93***</td>
<td>2,597.86***</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>1,992.06***</td>
</tr>
<tr>
<td>region</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Constant (β₀)</td>
<td>6,412.10***</td>
<td>3,375.85***</td>
<td>4,324.09***</td>
<td>4,297.43***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.1591</td>
<td>0.4312</td>
<td>0.4564</td>
<td>0.4971</td>
</tr>
</tbody>
</table>

N.A. = not applicable.  
Notes: N = 30 (Tibet is excluded). ***p < 0.01.  
Source: Authors’ calculations.
does not better explain the variation in central transfers. In model (4), we included all
the independent variables as well as the ethnic minority dummy. The ethnic minority
dummy was also statistically significant, but again with little increase in the adjusted
R-squared, which can be partly explained by the fact that the ethnic minority areas are
all concentrated in the west region.

Together, the results suggest that about one-half of the variation in central
transfers can be explained by regional dummies, and when regional dummies are
controlled for, pretransfer fiscal revenue matters only to a limited extent. As a result of
the allocative policy, the major source of postequalization fiscal inequality is intra-
regional inequality.

Overall, central transfers reduced the Gini coefficient of inter-provincial fiscal
revenue inequality by 44% from 0.28 to 0.16. The limitations of region-based
allocations of transfers become clear when we decompose pre and posttransfer fiscal
inequality using Theil’s T index (Table 3). Results show that before equalization, inter-
regional and intra-regional inequality each contributed to about half of the total
inequality across provinces. Although the central government’s region-based
equalization approach significantly mitigated inter-regional inequality (dropping
from 0.08 to 0.01 in Table 3), intra-regional inequality remained relatively high.

A closer look at the data reveals that some provinces are particularly
disadvantaged under this strongly region-based approach. For example, both Inner
Mongolia and Gansu are in the west region, and they received a similar level of
transfers from the central government (CNY10,289 per capita to Inner Mongolia and
CNY9,325 per capita to Gansu). However, because Inner Mongolia had much higher
pretransfer fiscal revenues (CNY7,331 per capita compared to Gansu’s CNY3,303 per
capita), it had much higher posttransfer fiscal revenue (CNY17,620 per capita
compared to Gansu’s CNY12,628 per capita).

Table 3. Equalization Effect at the Provincial Level, 2018

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</thead>
<tbody>
<tr>
<td>Gini coefficient</td>
<td>0.28</td>
<td>0.16</td>
<td>0.12</td>
<td>44%</td>
</tr>
<tr>
<td>Theil’s T index</td>
<td>0.16</td>
<td>0.06</td>
<td>0.10</td>
<td>62%</td>
</tr>
<tr>
<td>Inter-region</td>
<td>0.08</td>
<td>0.01</td>
<td>0.07</td>
<td>89%</td>
</tr>
<tr>
<td>Intra-region</td>
<td>0.07</td>
<td>0.05</td>
<td>0.02</td>
<td>32%</td>
</tr>
</tbody>
</table>

Note: The sample includes all 31 province-level units.
Source: Authors’ calculations.
B. From Central to Provincial Transfers

Provinces have adopted different models in both revenue and expenditure sharing (Figure 1). On the revenue side, the provincial share reflects differences in provincial choices, regional economic development, and revenue structure (Zhang and Martinez-Vazquez 2003). Although averaging 19% nationwide (excluding the four provincial-level municipalities), the share of revenues retained by the provincial government ranges from lows of 3% and 4% in Jiangsu and Liaoning, respectively, to highs of 38% and 35% in Ningxia and Hainan, respectively. On the expenditure side, the share of expenditure accounted for by provincial governments also varies significantly. Whereas the provincial governments of Jiangsu and Zhejiang accounted for only 7% of their total expenditures, those of Qinghai and Ningxia accounted for 32% and 24%, respectively.

At the aggregate level, provincial governments have expenditures in excess of their revenues and depend on central transfers to fill the gap. Nevertheless, drawing on their own revenues, a few provinces can provide more transfers to lower levels of government than they receive from the central government. The great majority of provinces, however, retain central transfers to fill their own fiscal gap (Figure 2).

One pattern that can be identified is that poorer provinces tend to keep more central transfers at their own level and pass on fewer central transfers to lower levels. The correlation coefficient between per capita “net addition” (the difference between transfers received and transfers passed to lower levels) made by provincial governments and per capita GDP is 0.42, which is statistically significant at the 1% level ($N = 26$, all 27 provinces/regions with prefectural units except for Tibet). In theory, the effect on equalization is neutral whether provincial governments undertake the spending themselves or pass the transfers on to lower levels of government. The result is especially difficult to judge due to the differing expenditure assignments across provinces.

To decipher these differences, we examine the differences in social spending among Jiangsu, Zhejiang, Ningxia, and Qinghai (Table 4). Like the central government, provincial governments provide few public services directly. This is reflected in the low share of social spending in their expenditure budgets, which ranged from 30% to 39% for three key services—education, employment and social security, and health care. The structures of their spending on these services share some similarities: Provincial education spending is primarily for higher education because many universities are administered by the provincial governments.

However, there are also important differences among these provinces that reflect different choices in assigning responsibilities. In Ningxia and Qinghai, the provincial
governments spent 18% and 15% of their expenditure, respectively, on social security and employment, and spending was split between public employee pensions and subsidies to the urban employee pension scheme. In contrast, the provincial governments of Jiangsu and Zhejiang spent only 8%–9% of their expenditure on social security and employment, nearly all of which went to public employee pensions for civil servants and retirees from public service units. The difference is that the task of financing subsidies to the urban employee pension scheme in Jiangsu is assigned to
lower-level governments, whereas this task is partially taken up at the provincial level in Ningxia and Qinghai.

This difference suggests that expenditure assignments are used interchangeably with transfers to achieve equalization in some provinces. By taking on the relatively large burden of subsidizing the urban employee pension scheme, Ningxia and Qinghai reduce the need to provide transfers to lower-level governments to assist in financing this responsibility, especially in poorer jurisdictions. In contrast, provincial governments in Jiangsu and Zhejiang may have judged their subordinate governments to have plentiful fiscal resources to meet this responsibility on their own. The overall equalizing effect of these decisions is difficult to evaluate with data used in this study, but previous research suggests that it may be more equalizing for the poorer provinces to keep these expenditures at the provincial level (Prud’homme 1995) due to a lack of fiscal and administrative capacity at lower levels.

C. Equalization at the Provincial–Prefectural Level

The level of pretransfer fiscal inequality varies significantly across provinces (Figure 3). On one hand, provinces such as Hainan and Fujian face low levels of

![Figure 3. Equalizing Effect by Provinces/Regions, 2018](image-url)

Notes: Provinces/regions are arranged by per capita gross domestic product. † There are missing values for some prefectures in these provinces/regions. Source: Authors’ calculations using 2018 final accounts and statistical yearbooks from individual provinces/regions.
inequality, with Gini coefficients lower than 0.20. On the other hand, in provinces/regions such as Xinjiang and Tibet, the Gini coefficients exceed 0.45. Across provinces/regions, there is no clear association between economic development and the level of pretransfer fiscal inequality (the correlation coefficient is \(-0.06\)). However, geography seems to play a key role: The provinces/regions that face the highest level of inequality are Xinjiang, Tibet, Shaanxi, Gansu, and Inner Mongolia. All these provinces/regions are in the west region and have proportionately more mountainous areas than the national average (Fang and Ying 2016). The huge disparity in natural conditions of the mountainous areas may contribute to their elevated pretransfer fiscal inequality (Liao and Wei 2016).

Provinces have made different equalization efforts. Largely mimicking the central government’s allocative practice, provinces also divide recipients into several categories—usually by per capita GDP—and assign different coefficients to their subsidization (Table 5). Overall, it is difficult to directly assess which provinces are more equalizing due to the variations in provincial–local assignments across types of services, different provincial standards for services (e.g., some provinces set a higher subsidy for the Urban and Rural Resident Basic Medical Insurance Scheme), and different pretransfer fiscal positions of prefectures and counties.

Despite the bewildering array of transfer programs and complexities involved, some interesting patterns emerge from a closer look into the provincial equalization effects (Figure 3). First, provincial transfers reduced inequality across all prefectures—the provincial average Gini coefficient was reduced from 0.31 to 0.15, a reduction of 53%. This is a greater equalization effect than that achieved at the provincial level by central transfers (Table 3).

In general, provinces with greater inequality seem to have put in bigger equalization efforts, both absolutely and relatively. To further identify associations, we ran a correlation analysis between the two measures of equalization effects and three potential key predictors: (i) pretransfer fiscal inequality; (ii) per capita GDP; and (iii) net addition of transfers, which measures how much a province is dependent on central transfers. As Table 6 shows, pretransfer fiscal inequality has a significant and strong association with the absolute equalization effect \((b = 0.84, p < 0.01)\) and a still significant but weaker association with the relative equalization effect \((b = 0.46, p < 0.01)\).

Interestingly, we find that economically developed provinces tend to be less equalizing (Table 6). The correlation between per capita GDP and relative equalization is \(-0.69\), which is statistically significant at the 1% level. Earlier we noted that poorer provinces retain more central transfers at their respective level, therefore suggesting a correlation between per capita GDP and dependence on central transfers. Here, we...
further identify that when a province is less dependent on central transfers and adds its “own” money, it is also less likely to allocate it for redistribution purposes—which is more aligned with the central government’s equalization goal. Instead, when less dependent on central transfers, priorities may be given to other purposes that favor
more developed local governments. In other words, when provincial priorities do not align with the central government’s equalization goal, the provincial government’s dependence on central transfers plays a key role. The effect of this is that being located in a rich province disadvantages some poor localities. In Guangdong, for example, per capita pretransfer fiscal revenue was CNY1,397 in Shanwei, CNY2,217 in Meizhou, and CNY2,333 in Shantou, all less than one-half of the national average of CNY4,841. However, not all these poorest localities received the most transfers from their provincial government. Most notably, Shantou received only CNY2,779 per capita, compared to CNY8,355 received by Meizhou and CNY6,582 by Shanwei. This makes Shantou one of the poorest prefectures in the PRC (posttransfer) despite being in one of the richest provinces.

Collectively, the findings suggest that equalization is not uniform or absolute across provinces. In fact, the dispersion changed relatively slightly—the CV coefficient increased from 0.22 to 0.25. Although all provinces reduced inequality, instead of all achieving a similarly low level of posttransfer inequality, differences remain. Significant equalization has been achieved, but some localities have been left out.

In the final step, we pooled together all prefectures to obtain a grand view. Again, we found that provincial governments had achieved significant equalization, reducing

Table 6. Correlation Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Absolute Equalization Effect</th>
<th>Relative Equalization Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretransfer fiscal inequality</td>
<td>0.84***</td>
<td>0.46***</td>
</tr>
<tr>
<td>Per capita GDP</td>
<td>−0.46***</td>
<td>−0.69***</td>
</tr>
<tr>
<td>Net addition of transfers</td>
<td>−0.41***</td>
<td>−0.42***</td>
</tr>
</tbody>
</table>

GDP = gross domestic product.
Notes: $N = 27$; ***$p < 0.01$.
Source: Authors’ calculations.

Table 7. Equalization Effect at the Prefectural Level (Pooled), 2018

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini coefficient</td>
<td>0.39</td>
<td>0.20</td>
<td>0.19</td>
<td>49%</td>
</tr>
<tr>
<td>Theil’s T index</td>
<td>0.25</td>
<td>0.07</td>
<td>0.18</td>
<td>71%</td>
</tr>
<tr>
<td>Inter-province</td>
<td>0.08</td>
<td>0.03</td>
<td>0.05</td>
<td>62%</td>
</tr>
<tr>
<td>Intra-province</td>
<td>0.17</td>
<td>0.04</td>
<td>0.13</td>
<td>76%</td>
</tr>
</tbody>
</table>

Note: The sample includes 321 prefecture-level units.
Source: Authors’ calculations.

In Guangdong, for example, per capita pretransfer fiscal revenue was CNY1,397 in Shanwei, CNY2,217 in Meizhou, and CNY2,333 in Shantou, all less than one-half of the national average of CNY4,841. However, not all these poorest localities received the most transfers from their provincial government. Most notably, Shantou received only CNY2,779 per capita, compared to CNY8,355 received by Meizhou and CNY6,582 by Shanwei. This makes Shantou one of the poorest prefectures in the PRC (posttransfer) despite being in one of the richest provinces.

Collectively, the findings suggest that equalization is not uniform or absolute across provinces. In fact, the dispersion changed relatively slightly—the CV coefficient increased from 0.22 to 0.25. Although all provinces reduced inequality, instead of all achieving a similarly low level of posttransfer inequality, differences remain. Significant equalization has been achieved, but some localities have been left out.

In the final step, we pooled together all prefectures to obtain a grand view. Again, we found that provincial governments had achieved significant equalization, reducing
the Gini coefficient for per capita fiscal revenue from 0.39 to 0.20. The equalization effect of 49% was moderately larger than the 44% achieved at the provincial level by central transfers. The Theil’s T index measure further shows provincial governments reduced both inter- and intra-provincial inequality considerably (Table 7). Overall, provincial governments had largely passed on the central government’s equalization to the next level. Provincial governments also appear to be better at reducing intra-regional inequality than the central government.

However, large disparities remain. The average per capita posttransfer revenue among the 321 prefectures in our sample was CNY9,943, but 29 prefectures had per capita posttransfer fiscal revenue greater than CNY20,000—more than twice the national average. Among these, the great majority are prefectures where Tibetans or other ethnic minority groups are concentrated and have received disproportionately high transfers. There are also a few cities that remain in this high-revenue group due to their high pretransfer fiscal revenue—notably Zhuhai, Suzhou, and Nanjing. At the other extreme, 11 prefectures had less than CNY6,000 per capita in posttransfer fiscal revenue—including Baoding, Xingtai, Handan (Hebei), Linyi (Shandong), Shantou, Chaozhou, Jieyang (Guangdong), Qinzhou, Guigang, Yulin (Guangxi), and Neijiang (Sichuan). In all these prefectures, both the pretransfer and posttransfer revenues were significantly below the national average, meaning these prefectures have largely been left out of countrywide equalization programs.

Part of the disparities reflected by the data arise from different expenditure assignments across provinces. As discussed previously, some provincial governments have centralized more spending at their own level so that local governments carry a lighter financial burden. For example, in Sichuan, Guangxi, and Hebei, the provincial governments contribute significantly to social security and employment, spending CNY869 per capita, CNY461 per capita, and CNY445 per capita, respectively. In contrast, in Guangdong and Shandong, provincial spending on social security and employment was only CNY112 per capita and CNY58 per capita, respectively. Therefore, posttransfer fiscal revenue may be less indicative for those located in Sichuan, Hebei, and Guangxi, given their relatively lighter responsibility in financing certain social services. This also means that those prefectures located in provinces with greater local responsibility for social spending (e.g., Shandong and Guangdong) are likely to be even more disadvantaged than they appear to be.

D. Transfers and Equalization during the COVID-19 Shock in 2020

As discussed previously, during the COVID-19 shock in 2020, more central transfers were made despite the decline in central fiscal revenue. These transfers...
were passed to the subprovincial units largely following the prepandemic pattern (Figures 2 and 4). Proportionally, even more was passed to subprovincial units in 2020—in 2018, 87% of total central transfers were passed to subprovincial units, while the percentage in 2020 reached 89%. In other words, the provinces did not retain more, but instead transferred slightly more to local governments in the face of the pandemic.

The equalization patterns of both central and provincial transfers also remained largely unchanged in 2020. Inter-provincial fiscal revenue inequality was reduced from 0.27 to 0.15, a decrease of 45%, almost equal to the level in 2018 (Tables 3 and 8). Once again, the central government’s approach was more effective in mitigating inter-regional inequality than intra-regional inequality.

Provincial governments also made a similar equalization effort to that in 2018. On average, provinces reduced their Gini coefficients from 0.28 to 0.12, very close to the before- and after-equalization levels in 2018 (Figures 3 and 5). The dispersion among provinces was again slightly elevated after equalization—the CV coefficient increased from 0.22 to 0.25 (identical to 2018 figures). When pooled together, the prefecture-level Gini coefficient was reduced from 0.35 to 0.18, with both inter- and intra-provincial inequality reduced similarly to the situation in 2018 (Tables 7 and 8).
A closer look at individual prefectural data reveals that while the average per capita posttransfer fiscal revenue increased to CNY10,880 per capita, there were still 11 prefectures with revenue of less than CNY7,000 per capita. The list remained similar to the 2018 version, including Baoding (Hebei), Zaozhuang, Linyi (Shandong),

Table 8. Equalizing Effect at the Provincial and Prefectural Levels, 2020

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>At provincial level (N = 31)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>0.27</td>
<td>0.15</td>
<td>0.12</td>
<td>45%</td>
</tr>
<tr>
<td>Theil’s T index</td>
<td>0.14</td>
<td>0.05</td>
<td>0.09</td>
<td>62%</td>
</tr>
<tr>
<td>Inter-region</td>
<td>0.07</td>
<td>0.00</td>
<td>0.07</td>
<td>94%</td>
</tr>
<tr>
<td>Intra-region</td>
<td>0.07</td>
<td>0.05</td>
<td>0.02</td>
<td>27%</td>
</tr>
<tr>
<td><strong>At prefectural level (N = 321), pooled</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>0.35</td>
<td>0.18</td>
<td>0.17</td>
<td>50%</td>
</tr>
<tr>
<td>Theil’s T index</td>
<td>0.20</td>
<td>0.06</td>
<td>0.15</td>
<td>72%</td>
</tr>
<tr>
<td>Inter-province</td>
<td>0.07</td>
<td>0.03</td>
<td>0.04</td>
<td>59%</td>
</tr>
<tr>
<td>Intra-province</td>
<td>0.13</td>
<td>0.03</td>
<td>0.10</td>
<td>78%</td>
</tr>
</tbody>
</table>

Note: There are missing values for some prefectures in these provinces. Source: Authors’ calculations.

Figure 5. Equalizing Effect by Provinces/Regions, 2020

Notes: Provinces/regions are ranked by per capita gross domestic product in 2018 (for comparison with Figure 3). †There are missing values for some prefectures in these provinces/regions. Source: Authors’ calculations using 2020 final accounts and statistical yearbooks from individual provinces/regions.
Zhoukou (Henan), Shantou, Jieyang (Guangdong), Guilin, Wuzhou, Qinzhou, Guigang, and Yulin (Guangxi). Conversely, all those prefectures with the highest posttransfer fiscal revenue were still located in the west and ethnic minority regions.

The results suggest that despite the heightened fiscal pressure during 2020, the system was persistent in delivering fiscal equalization. Provincial governments not only transferred even slightly more central transfers to local governments but also maintained the prepandemic equalization patterns. To a large extent, the persistence reflects the government’s continuous efforts to regulate transfers and clarify cost-sharing rules (State Council 2016a, 2016b; General Office of the State Council 2018). These efforts provided a critical buffer to the pandemic shock.

V. Conclusions

This paper assesses the implementation of fiscal equalization policies at the central–provincial and provincial–prefectural levels. At the central–provincial level, we find that the allocation of central transfers is primarily based on macroregions, which are insufficiently fine-tuned to target all poor provinces. As a result, while central transfers significantly mitigate inter-regional inequality, intra-regional inequality remains relatively high.

In terms of the transmission of transfers by provincial governments to lower levels, poorer provinces tend to retain more central transfers at their own level, which, in some cases, alleviates the financial burden of local governments within their jurisdiction. Provincial transfers reduced inequality across prefectures, but this equalization effort was not uniform or absolute. Provinces with greater inequality generally put in bigger equalization efforts, but not necessarily enough to mitigate the inequality. We also find that richer provinces—which are less dependent on central transfers—tend to be less equalizing, probably to advance some provincial interests other than redistribution. Overall, provinces have largely passed the central government’s equalization efforts on to the next level, but the change in dispersion is small among provinces, and there are still localities left out of the process.

Our analysis of the 2020 pandemic-year data further reinforces these observations. Under the government’s strengthened rules around transfers, both central and provincial transfers appeared persistent in delivering fiscal equalization despite the COVID-19 shock. However, the persistent patterns also mean that the key problems have remained unaddressed—within the PRC’s complex IFS, equalization efforts are not uniform or absolute across provinces, and some localities are still disadvantaged.
This study has several limitations. First, our data was directly collected from government reports, which still have various constraints (e.g., inconsistent reporting styles). To facilitate analysis, we had to make necessary adjustments, which are not always consistent with standard international practices (elaborated in Appendixes 1 and 2). Second, in this study, we only considered budgetary revenue. In the context of the PRC, local governments also have extra-budgetary sources of revenue. Relatively equal “posttransfer” fiscal revenue can still hide significant fiscal disparities. To fully understand the fiscal disparities between local governments would require a comprehensive study of both budgetary and extra-budgetary data, but such data are currently either inaccessible or difficult to compile. Finally, this study focuses on the revenue side to examine the government’s equalization efforts. However, the cost of providing public services may vary significantly across localities due to differences in location, population size, demographic trends, welfare status, and path-dependency (Blochliger et al. 2007, Blochliger and Charbit 2008). These considerations may significantly change what equality looks like. Continuous improvements in data quality and access may support future research endeavors in these directions.

Despite the limitations, this study strongly contributes to the existing literature by employing the most recent data from 2018 and 2020, with both years coming after the passage of the new budget law in 2014. Unlike the existing literature, the data allow us to evaluate the reform not only during the most recent stage but also below the central-provincial level. Using these data, we show the diverse challenges and choices made by provinces and point out some important patterns in the allocation and transmission of transfers.

Earlier studies (e.g., Fock et al. 2008; Martinez-Vazquez, Qiao, and Zhang 2008) suggest that the complex structure of the PRC’s IFS impedes resource flows. They warn that increased funding will be insufficient to equalize public services and thus call for a substantial reform of the IFS. Our study supports this argument by showing that, after 2 decades of dedicated efforts to equalize public services, the IFS still does not direct resources to where they are most needed, resulting in some localities being neglected. Moreover, the level-by-level transmission of transfers downward through the administrative hierarchy is slow and unpredictable (World Bank 2006, Tan and Wong 2022), further hindering the provision of public services. Thus, the design of the IFS still poses challenges for the equalization of public services that have not been mitigated by the reforms.
References


Appendix 1. Data Treatment Summary

A. Fiscal Transfers

The Government of the People’s Republic of China (PRC) reports transfers in three broad categories: tax rebates, general transfers, and earmarked (or specific purpose) transfers. The definitions and content of each category have changed several times since the terms were first introduced during the 1994 tax reform. From the time of their introduction, tax rebates, counting as transfers, dominated for more than a decade but fell to below 30% of total transfers beginning in 2006 (CEIC data). In 2007, tax rebates were removed from transfers and treated as part of local government revenues (State Council 2007, State Council 2014), a treatment more consistent with international practices. Inexplicably, they were quietly returned in 2019 as part of general transfers. The number of earmarked and general transfers has also shifted over the years, with earmarked transfers peaking at 220 in 2013 and falling to just 22 in 2020 (Xiao 2016). In the meantime, the number of general transfers ballooned to 63 categories in 2020. For this study, we focus only on the total amounts of the transfers.
As aforementioned, tax rebates were merged into general transfers from 2019 onward; therefore, instead of following international practices, we treat them as transfers throughout the study.

We did not consider the remittances from lower-level governments. In theory, a more accurate approach to calculating transfers would be to deduct the remittances from lower-level transfers. However, we do not have data on prefectural–provincial remittances in our provincial final accounts. This means that our study overestimates the size of lower-level transfers. However, this overestimation is not likely to be serious because the size of such remittances tends to be relatively small. For example, in Hebei province, the provincial government transferred CNY273 billion to lower-level governments and received approximately CNY7 billion from lower-level governments.

In response to the coronavirus disease pandemic, in 2020, the central government introduced a “special transfer payment” of CNY599 billion, accounting for around 7% of the total central transfers made in 2020. This fund was targeted mainly at the public health sector. Since the Ministry of Finance did not release details of the payment allocation to regions, this transfer was not considered throughout the study.

B. Prefectures

We followed the Ministry of Civil Affairs (2020) definition to identify prefectures. However, there are three sources of complication. First, the implementation of the Province Managing County (PMC) reform means that the transfers some counties receive are determined by their provincial governments, without intervention by the prefectural governments. For counties under the PMC reform, provinces should disclose information about the transfers they allocate to the counties. To maintain consistency, we identified the prefecture to which such counties belonged and made the necessary adjustments. For example, in the case of Fujian province, Pingtan county is reported separately. However, according to the definition of the Ministry of Civil Affairs, Pingtan is under the administration of Fuzhou municipality. We added the provincial transfer payment to Pingtan and the provincial transfer payment to Fuzhou (excluding Pingtan) to derive the total transfer payment to Fuzhou (including Pingtan). Then, we divided this number by the total population of Fuzhou (including Pingtan) to obtain the per capita provincial transfer to Fuzhou. Administrative units for which we had incomplete data were excluded from our analysis.
The second source of complication comes from separately reported economic development zones. These economic development zones are not under the administration of any prefecture in the corresponding province. Hence, their transfer data were neither merged nor used in this study. A data treatment summary can be found in Appendix Table A1.1.

### Table A1.1. Treatment of Separately Reported Data for Counties Adopting the Province-Managing-County Reform and for Economic Development Zones

<table>
<thead>
<tr>
<th>Counties Adopting the PMC Reform</th>
<th>Treatment of the Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hebei: Xinji, Dingzhou</td>
<td>Xinji data were merged with Shijiazhuang data; Dingzhou data were merged with Baoding data.</td>
</tr>
<tr>
<td>Fujian: Pingtan</td>
<td>Pingtan data were merged with Fuzhou data.</td>
</tr>
<tr>
<td>Henan: Gongyi, Lankao, Ruzhou,</td>
<td>Gongyi data were merged with Zhengzhou data; Lankao data were merged with Kaifeng data; Ruzhou data were merged with Anyang data; Hua data were merged with Xinyang data; Dengzhou data were merged with Nanyang data; Yongcheng data were merged with Shangqiu data; Gushi data were merged with Xinyang data; Luyi data were merged with Zhoukou data; and Xincai data were merged with Zhumadian data.</td>
</tr>
<tr>
<td>Hubei: Xiantao, Qianjiang,</td>
<td>Jiyuan data were excluded from the analysis because Jiyuan has adopted the PMC model and thus is not under the administration of any prefecture in Henan.</td>
</tr>
<tr>
<td>Tianmen, Shennongjia</td>
<td>Data for these counties were all excluded from the prefecture-level analysis because they have adopted the PMC model and thus are not under the administration of any prefecture in Hubei.</td>
</tr>
<tr>
<td>Hainan: Qionghai, Wenchang,</td>
<td>Data for these counties were all excluded from the prefecture-level analysis because they have adopted the PMC model and thus are not under the administration of any prefecture in Hainan.</td>
</tr>
<tr>
<td>Wanning, Dongfang, Wuzhishan,</td>
<td></td>
</tr>
<tr>
<td>Tunchang, Chengmai, Lingao,</td>
<td></td>
</tr>
<tr>
<td>Baisha, Changjiang, Ledong,</td>
<td></td>
</tr>
<tr>
<td>Lingshui, Baoting, Qionghong,</td>
<td></td>
</tr>
<tr>
<td>Ding’an</td>
<td>Shihezi data were excluded from the analysis because Shihezi has adopted the PMC model and thus is not under the administration of any prefecture in Xinjiang.</td>
</tr>
<tr>
<td>Xinjiang: Shihezi</td>
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</tr>
<tr>
<td>Economic Development Zones</td>
<td>These data were all excluded because they are not under the administration of any prefecture in their respective provinces.</td>
</tr>
<tr>
<td>Hebei: Xiong’an</td>
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<td>Jiangxi: Ganjiang</td>
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<tr>
<td>Hainan: Yangpu</td>
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<tr>
<td>Guizhou: Gui’an, Shuanglonggang</td>
<td></td>
</tr>
<tr>
<td>Shaanxi: Yangling</td>
<td></td>
</tr>
</tbody>
</table>

PMC = Province Managing County.
Source: Authors’ compilation.
C. Population

We sourced the initial population figures from the *China Statistical Yearbooks* and *Provincial Statistical Yearbooks*. The *China Statistical Yearbooks* provide resident population data at the provincial level for both 2018 and 2020, and the 2020 population data correspond to the census results. However, we encountered a discrepancy in the reporting of population data at the prefecture level among the *Provincial Statistical Yearbooks*. Some provinces reported *hukou* (household registration) population instead of resident population figures, as summarized in Appendix Table A1.2. Hukou is the household registration system employed in the PRC, officially designating an individual as a permanent resident of a specific region. With increased migration, many people may reside in an area different from their hukou registration, leading to a disparity between the hukou population and resident population.

To address this issue, we made additional efforts to acquire resident population data from alternative sources. For instance, in the case of Qinghai, we obtained the resident population data for 2018 from the prefectural Statistical Communiqué on National Economic and Social Development. For the year 2020, we obtained resident population data from the Communiqué of the Seventh National Population Census, available on the official website of each province.

Despite our best efforts, we encountered a limitation in obtaining resident population data for the year 2018 in four provinces: Liaoning, Jilin, Heilongjiang, and Xinjiang. As highlighted in a previous study by Li and Gibson (2013), the use of hukou population data instead of resident population data can introduce distortions in per capita economic figures and lead to inflated inequality outcomes. In the context of our study, the use of hukou data for the four provinces may have influenced the results by potentially exaggerating per capita fiscal revenue in economically developed areas and underrepresenting the figures in regions with significant outflows of hukou population.

The 2020 census results confirm substantial disparities between the resident population and hukou population in some prefectures among the four affected provinces. For instance, in the three northeastern provinces, such as Heilongjiang’s Suihua, the hukou population can exceed the resident population by up to 28%. In Xinjiang, the situation is more pronounced, particularly in Urumqi and Karamay, where the gaps between the resident population and the hukou population are the...
<table>
<thead>
<tr>
<th>Type of Population Data Used</th>
<th>2018 Data Source</th>
<th>Type of Population Data Used</th>
<th>2020 Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qinghai</td>
<td>Resident population</td>
<td>Statistical Communiqué on National Economic and Social Development</td>
<td>Resident population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(since resident population data was also not found in Statistical Communiqué on National Economic and Social Development)</td>
<td></td>
</tr>
<tr>
<td>Liaoning, Jilin, Heilongjiang, Xinjiang</td>
<td>Hukou population</td>
<td>Provincial Statistical Yearbooks</td>
<td>Resident population</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.
widest within the province. In these two cities, the resident population surpasses the hukou population by 76% and 56%, respectively.

While we acknowledge that the discrepancies in population data may have affected the per capita fiscal revenue data and inequality calculations, we maintain that these distortions are unlikely to significantly alter the substantial findings of our study. It is important to note that for the year 2018, we relied only on hukou population data for four out of the 27 provinces, limiting its overall effect on our analysis. Further, for the year 2020, we obtained resident population data for all provinces, ensuring more reliable and comprehensive results. This enhances the validity of our findings and strengthens the overall robustness of our study.

Appendix 2. Data Notes

Data for this study were collected between November 2019 and October 2022. By this time, all subnational governments were disclosing their budgets and final accounts on their websites. Our research benefited greatly from this development. However, we also noted that significant improvements are still needed. In addition to the issues identified by the Ministry of Finance’s own inspection (Ministry of Finance 2019) and third-party investigations (Tsinghua University 2018), we identified the following limitations in the disclosure of fiscal data.

A. Locating 2018 and 2020 Final Accounts

Locating final accounts is still time-consuming because local governments are inconsistent in terms of where they disclose their final accounts, and some local governments combine all types of final accounts under similar names, making it difficult to find specific ones. To assist in the search process, the Ministry of Finance launched a unified platform to provide direct links to provincial final accounts. At the current stage, this practice is still limited to the central level: Subnational governments tend only to report final accounts at their own level (including governments and their departments and units). It thus required extra time for us to locate the 2018 and 2020 local final accounts. For each prefectural and county government, we started by searching the keywords “XX 市/县/2018/2020 财政决算 (XX city/county 2018/2020 final accounts)” in Baidu. If the final accounts could not be located this way, we would go to the local government’s website and/or the local finance bureau’s website. On some websites, it is easy to find the final accounts, but other websites are difficult to navigate, and links sometimes redirect to pages that do not exist. The setting up of
platforms for subordinate governments would be a helpful next step to improve the search process, both for researchers and for the public.

B. Transfer Data

All the provincial 2018 and 2020 final accounts that we found provide some information about transfers. However, subnational governments are inconsistent in terms of how they report the transfer payments that they allocate to prefectures and counties. Some (e.g., Beijing) combine tax rebates and general transfers, which become slightly more common in 2020 (e.g., Jiangsu, Zhejiang, Qinghai); some (e.g., Zhejiang, Hubei, Qinghai, and Xinjiang) only report how they allocate earmarked transfers, not general transfers, across prefectures. Both Sichuan and Guangdong provide very detailed information on how they allocate individual items of transfer payments across prefectures and counties but provide no information on the total transfer payments. These practices are consistent with the Ministry of Finance (2016b) guidelines, which require that general transfers be broken down into different items (not necessarily into different prefectures or counties), while earmarked transfers must be broken down into both items and different prefectures or counties. In other words, it is not the implementation of the data transparency reforms but the policy itself that poses an important barrier for studies of this kind.

We attempted to address this data issue by collecting data from the prefectural level for the missing provinces, but this created another issue: Prefectural governments are inconsistent in terms of whether they report transfer data for the entire prefecture or the prefectural level only. For example, Chaozhou, Zhaoqing, Heyuan, Maoming, and Yunfu (all in Guangdong) report only provincial transfers to the prefectural level, and they exclude provincial transfers to counties and districts within their jurisdiction, thus rendering comparisons with data elsewhere impossible. Since this issue would largely affect the validity of the data, we have manually calculated the transfers for all prefectures in some provinces (e.g., Guangdong). For example, for each prefecture in Guangdong, we summed up the earmarked transfers of all payment items for that prefecture and counties within its jurisdiction based on the information released by the provincial government.

Provincial governments are also inconsistent in terms of whether they report transfer payments to those counties adopting the PMC reform. While the great majority of provinces have pilot counties (Li, Liu, and Zheng 2016), many (e.g., Shandong, Jiangsu, Shaanxi, Shanxi, Guangxi, and Hebei) do not report how much they allocate to such pilot counties. This means that to collect data, one must go
to the prefectural final accounts, and when the information is still missing, which is common because the PMC reform is supposed to cut the fiscal links between the prefectural and county levels, one must go to the county final accounts, thus requiring a tremendous investment of time to carry out the data collection work.

Finally, it is not uncommon for different levels of government to report different numbers for the same indicator. For example, in the central government’s 2018 final accounts, the central government reported that it allocated CNY 95.2 billion (including tax rebates, general transfers, and earmarked transfers) to Beijing. In Beijing’s 2018 final accounts, however, the municipal government reported receiving CNY 100.95 billion from the central government. To maintain consistency, we tried to collect data for the same measure from only one type of source (e.g., central–provincial transfers from the central government’s final accounts, and provincial–subprovincial transfers from the provincial governments’ final accounts). However, this was not always possible. As discussed earlier, some provinces do not report how they allocate earmarked transfers across prefectures; in such cases, we had to collect data from the prefectural level, and we compared data across levels and excluded those with large discrepancies. For example, the Zhejiang government reported that CNY 4,812.4 million of earmarked transfers went to Jinhua prefecture in 2020. However, in its own report, the Jinhua government reported that CNY 7,449.9 million was received (for the entire prefecture). This prefecture was thus excluded from our sample.