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Fiscal Federalism in Pakistan Revisited: The Crisis of Demographic Governance

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ABSTRACT

In fiscal federal systems, it is assumed that demographic information is objective and is used to allocate resources and maintain intergovernmental balance. In multi-ethnic federations like Pakistan, census governance frequently devolves into an institutional "black box." Because these processes lack independent verification, they fail to track actual demographic shifts. Consequently, the resulting revenue allocations completely mismatch real-world population distributions. This study proposes a new approach, Demographic Federalism, for assessing the impact of the institutional design of the 2017 and 2023 Digital Censuses on fiscal equity. The analysis shows the negative impacts of centralized, un-audited headcount systems on regional fiscal balance and highlights the extreme nature of the urban stress test that is being put on the megacity of Karachi. The test was conducted by implementing an Instrumental Variable Two-Stage Least Squares (IV-2SLS) panel regression model for 9 yrs of longitudinal data (2017–2025) and instrument endogenous population shares with independent proxy variables for the growth of the transactional identity registry from the National Database and Registration Authority (NADRA). The results of the empirical analysis show that the model has high explanatory power ($R2 = 0.8547$), highlighting a structural "demographic cage" with a negative elasticity, indicates a province's rising population share yields a highly significant on per-capita allocations ($\beta = -590.58$, $p < 0.01$). In addition, a regressive horizontal equalization pattern is revealed by the model which systematically underfunds less affluent jurisdictions (β _ poverty= -2432.1, $p < 0.01$). But, the story changes with the introduction of a comparative Fixed Effects Panel OLS specification. It reveals endogeneity and a false positive signature of computed census error ($\beta = 8140.4$, $p < 0.05$), and demonstrates that traditional linear tracking models just mistake the urban undercounting anomaly. In this regard, this paper attempts to propose a Provincial Co-Ownership Census Governance Model (CCGM) to overcome this profound distrust between the governments about the headcount data. The criterion of this framework shifts the management of the census out of the hands of a single executive and toward a "polycentric" cooperative federal system. Where subnational data is audited by independent bodies and legally binding through a Post-Enumeration Survey. The evidence catches that independent demographic credibility is found to be an absolute precondition for stability, equity, and institutional legitimacy in multi-tiered states.

Introduction

A stable fiscal social contract is needed in multi-ethnic federations to survive. Central and local governments need to agree upon the extraction and sharing of resources, assuming that the underlying mathematics is absolutely neutral. The key idea behind this contract is that it has zero bias in application. Indeed, the classical theory of fiscal federalism, as developed by Musgrave (1959) and

Oates (1972), assumes that population is an independent variable given in the outside world. For them the census is simply a fundamental denomination to work out per capita equity and even to compensate for the separation of state lines.To them the census is merely a basic administrative denominator from which to work out per capita equity and even to even out the state lines. This is their traditional way of thinking and they see it as totally unrelated to political conflict. However, theory is often misapplied in contexts of the Global South where institutional weakness or political manipulation may result in the failure to count accurately. It is precisely the "seeing like a state" trap that Scott (1998; 2020) describes: a state agenda for seeing is shaped by schemes of legibility that misrepresent and/or are impervious to local realities. As demographic information becomes suspect, the delicate balance of fiscal federalism, revenue allocation and political representation starts to unravel, turning a simple statistical fact into a hotbed of political confrontation. The Pakistani context is an important and high-stakes real world setting for an empirical analysis of this demographic-fiscal nexus, especially in the wake of controversial census operations in 2017 and 2023. Following the rectification of the 1973 constitution, population has always been the dominant criterion governing both in the determination of electoral boundaries and the National Finance Commission allocations. Intellectual debate within the Pakistani state perpetually fluctuates between the structural demands of democratic institutionalization and the operational prerequisites of substantive devolution. The 7th NFC Award was an important event because it introduced a new and innovative approach to promote fiscal equity that included poverty/backwardness, revenue collection/generation and inverse population density as auxiliary factors to distribute resources horizontally. However, it is observed from these debates that the issue of population weighting is still unresolved and continues to be considered as a strong 82% share of distributive matrix (Jaffery and Sadaquat, 2006; Government of Pakistan, 2010; Kassi and Baloch, 2026). This focus on a single, disputed measure has led to a rent-seeking dynamic in demography (Ahmad, 2025; Khan & Aftab 2025). In these circumstances, local or provincial leaders treat headcount data as a leverage tool for resource capture rather than an exercise in statistical accuracy. Consequently, the current controversy overpopulation statistics has resulted in an NFC standstill, with the formal award process brought to a standstill for more than 10 years. As a result, this scenario is trapping the country in an archaic 2010 allocation model that fails to account for current demographic shifts.

This study claims that the persistent tensions in Pakistan are based on a more fundamental structural institutional failure that can be described as Demographic Federalism crisis. However, the principles of fiscal federalism are the rules governing the distribution of financial resources, while the informational architecture is the rules under which the distribution of financial resources depends on. Historically, and more recently, there has been hyper-centralization of demographic data management in Pakistan, with a corresponding lack of credibility between the federal Pakistan Bureau of Statistics (PBS) and provincial stakeholders. According to Farooq (2023) and Ahmed et al. (2025) argue that this centralization puts provinces in a passive position, and not their own, as data owners, and that this invariably leads to long-term legal and political disputes. This exclusion is most evident in Karachi. As the economic hub of the country, the city faces constant disputes over systematic undercounting. By focusing on Karachi, the findings of this research shows the increasing trend of revenue centralization coupled with the mismeasurement of demographic data leads to cycles of under-investment, which put not only national productivity but also social cohesion at risk.

This study, therefore, extends the modern theory on federalism in three ways. It shifts from a single consideration of distributive outcomes to a critical examination of the institutional mechanisms of data production, and it argues that the basis of a viable federal state is a process of producing credible demographics. Secondly, the study uses a sound simulation analysis to quantify the fiscal distortions generated by centralized census governance, thus creating a solid empirical link between the institutional theory and budgetary practice. Lastly, the proposed model is a normative institutional model – the Provincial Co-Ownership Census Governance Model (CCGM). This model aims at reconfiguring the census from the executive monopoly to a transparent, cooperative administrative process. This paper brings together the integrity of administrative data and also fits the need of intergovernmental finance and is very relevant in Pakistan as well as other fragmented federations facing the challenge of distributing resources based on demographics.

Literature Review

Classical Fiscal Federalism and the Institutional Turn

The idea of allocative efficiency has been a longstanding underpinning of the academic debate on fiscal federalism. Allocation, distribution and stabilization are the three main functions of government as described by Musgrave (1959), and these functions have formed the basis of Oates' (1972) Decentralization Theorem. This classic model suggests that subnational governments, which are closer to the people and have more local information, can be more effective in providing public services to the varying preferences of citizens. Yet this first generation of theory is a theory without any explicit postulation of an objective exogenous

data, nor of a benevolent state that operates on that. Younas (2018) and Olson (1969) have highlighted that it is difficult to know how effective decentralized public goods provision will be unless the central government can still exercise its macroeconomic stabilization function.

A major turning point was the introduction of Second-Generation Theory (SGT) that focused the academic attention of the political incentives and institutional constraints in decentralized systems. Theories on fiscal decentralization have summarized that there are some risks associated with fiscal decentralization which can occur if it is not well designed. In the spirit of the famous argument by, we believe, Weingast (1995), the federalism that yields market results calls for credible commitment mechanisms to ward off (central) encroachments and for hard budget constraints. The findings of later studies by Rodden (2006) and Shah (2007) indicated that while decentralisation is having limited impact, there remains no connection between the revenue and expenditure powers. This imbalance often results in fiscal deficits in the vertical dimension, less accountability, and fiscal instability over the long term.

The studies of recent years on SGT principles in Pakistan, highlight how SGT principles can improve the delivery of services (Raza, 2024; Ahmad et al., 2025; Arif & Chisti, 2022), but also show that this can reinforce intergovernmentalism inconsistencies in developing economies. As importantly, these institutional devices examine political incentives but largely focus on allocative instruments, especially population, which are seen as exogenous administrative variables rather than instruments subject to political control.

Institutional Political Economy and Demographic Governance

The last few scholarships have moved away from efficiency-based arguments to critical institutional political economy, which means that decentralization results depend on the incentive design. To reduce political interference in intergovernmental transfer systems, they need to be transparent, and rule based, as Shah (2007) argues. In the Pakistani context, Shahid et al. (2024) noted that although decentralization of tax collection can help the growth process, rigid political institutions can offset such benefits. Moreover, the implementation of the constitutionally complex models that enable decentralization for efficiency are ineffective in practice due to the practical hurdles they encounter (Ahmed and Kamal, 2014; Bardhan, 2002). Treisman (2007) states that federal arrangements work best when political institutions promote the congruence between fiscal responsibility and accountability. Ahmad and Brosio (2022) further argue that the institutional design ultimately determines whether decentralization promotes service provision or merely serves as a tool for redistribution. In this context, Agrawal et al. (2024) emphasizes that global political polarization is compelling a re-examination of fiscal externalities and interjurisdictional competition within "distressed federations," where the census itself has become a site of strategic contestation. Considering the fact, there is a need to examine the role of institution and that of asymmetric information on the success of the decentralization process. Well-managed institutions are the major channel through which decentralization can influence long-term economic growth.

Urban Fiscal Federalism and the "Missing Middle"

Fiscal Policy in general is used to manage macroeconomic framework using public spending and tax policies. In fact, it is aimed to steer variables like aggregate demand, inflation, employment, economic growth, debt etc. In this way, it is instrumental in stabilizing the fluctuations in business cycles and regulating economic output, especially when markets have frictions (Ali, et al., 2018). While urban fiscal federalism is a subfield of public economics that examines how financial responsibilities, revenue powers, and public service delivery are decentralized specifically to metropolitan and municipal governments. As the literature on urban fiscal federalism highlights a chronic structural imbalance in rapidly urbanizing federations. Although megacities serve as the primary engines of national GDP (Bird & Slack, 2004; Bahl et al., 2013), they frequently suffer from "fiscal dwarfism," where municipal revenues consistently lag the explosive demand for infrastructure. This systemic under-funding forces an unhealthy transfer dependency, leaving urban survival hostage to the equity of intergovernmental allocation formulas. The Pakistani case, particularly in Karachi, illustrates this urban paradox: fiscal gaps are further compounded by metropolitan fragmentation, overlapping jurisdictions, and contested demographic data that stifle long-term planning (Slack, 2021). As Khan (2024) argue, this creates a cycle of perpetual deficit and rising debt that threatens federal stability.

The other aspect of federal stability that has often been ignored is the control of information that defines fiscal distribution. According to Anderson and Fienberg (2001), census methods are political activities that influence representation in and of themselves. Scholars have only just started to view administrative data systems as state institutional assets. Like, Pepinsky et al., in 2017 argued that state capacity is the ability to map the population legally. Banerjee and Pande (2007) mentioned that institutional metrics shape voter choices, whereas Manheim (2023) point out that even the smallest measurement error can significantly alter political incentives in emerging democracies, leading to statistical gerrymandering.

Comparative Perspectives: Why Pakistan is a Unique Case

A comparative evaluation of the fiscal architecture in Pakistan and that of other major federations, such as India and Nigeria, is known to have an idiosyncratic confrontation between data and fiscal policy. In India, the 15th Finance Commission sparked controversy by changing the population criteria from the 1971 census to the 2011 census for tax devolution. This created a potential demographic penalty for states with effective family planning strategies (Rao, 2017). The same is true in Nigeria, where ethnic conflict has constantly been pushed off by the politics of population enumeration, which insist on a census (Sunday and Yohanna, 2024). However, Pakistan's dilemma is unique due to the extreme population-weighting of its allocation formula. Compared to India, which has a more diversified criterion to cover forest cover and tax effort, the highest weight of population at 82% in Pakistan creates a high-stakes environment where statistical error is exaggerated into systematic fiscal distortion.

This population-dominant NFC formula turns census accuracy into a zero-sum game, where one province gains at the expense of another. Subsequently, this has led to a sense of relative deprivation within the federating units at the domestic level such as Sindh, Balochistan and KP as a result of this horizontal distribution formula. Punjab is the biggest beneficiary due to its population size, but the trends of its growth have now changed, and the Digital Census of 2023 has put the Council of Common Interests (Shehzad, 2025) in limbo. In contrast, in a research report, the Federation of Pakistan Chambers of Commerce and Industry (FPCCI, 2025) states that there is a huge per-capita gap in development in Balochistan with an amount of about PKR 46,216 per person in the financial year of FY2024-25. The Karachi stress test is the most acute among the various demographic-fiscal conflicts. However, this megacity is the main economic driver of Pakistan, generating nearly 25% of the national GDP, but its governance is limited by the so-called dysfunctional institutional structure (Mir, 2025). The 2023 Census evoked strong legal and political conflicts after the first counts showed far fewer people than provincial and municipal estimates. This statistical undercounting has straightforward fiscal consequences. The undercount of even ten per cent of a megacity may lead to billions of rupees of transferred revenue and subsequent reductions in the quality-of-service delivery, a process identified as urban under-financing (Ahmed et al., 2025).

The gap between the contribution of revenue and receipt of fiscal in urban centers like Karachi exemplifies what can be termed as the missing middle of the Pakistani federal system of local government, as depicted in **Table 1**.

Table 1; Provincial Resource Distribution & Transfers (FY 2024-25 Projection)

Province	Population Share (%)	Per-Person Transfer (PKR)	Primary Challenge
Punjab	52.90%	26,984	Intra-provincial disparity (South vs. Central)
Sindh	24.50%	31,489	Urban-Rural divide & Karachi under-count
KP	14.60%	27,953	Security costs & Merged districts integration
Balochistan	5.90%	46,216	Vast geography vs. weak service delivery

Source: Adapted from PIDE (2025) and FPCCI Governance Report (2025)

This provincial analysis indicates that although the 7th NFC Award marked a significant step forward in terms of provincial autonomy, it has become outdated (Pakistan Institute of Development Economics [PIDE], 2025). The formula does not consider rapid urbanization, which grew from 36% in 2009 to above 41% in 2024. Thus, Karachi, Lahore, and other cities are forced to manage twenty-first-century infrastructure needs with a financial system that was created to meet the financial needs of 2009. The ensuing atmosphere encourages demographic rent-seeking as opposed to productive competition making the 11th NFC Award not just a fiscal necessity but a structural necessity for national stability.

Gap in Existing Research

Although the literature on fiscal federalism and decentralization is rich, a major gap in the analytical understanding of the current state of events remains: the inability to operationalize the idea of demographic governance as a variable within the framework of fiscal federalism theory. Population is invariably regarded as an input in the formulas of allocation, as opposed to an institutional product, which was a product of disputed administrative procedures. With the failure to regulate demographic data, the current studies create a major blind spot in the comprehension of federal instability. This paper fills this gap by suggesting that without demographic federalism, meaning co-ownership and verification of data at all levels of government, fiscal federalism is structurally incomplete and goes through repeated legitimacy crises, especially in the post-18th Amendment era, when the stakes of politics are extremely high.

Constitutional and Institutional Context of Pakistan

Pakistan has an elaborate but often conflicting constitutional structure that determines the operational environment of fiscal federalism. Article 160 requires an establishment of the National Finance Commission after every five years to decide how resources should be allocated between the federation and provinces. Article 153 and 154 provide for the establishment of a Council of Common Interests as a joint dispute solving body to handle interprovincial tensions. As Ahmed et al. (2025) mentions that CCI is constitutionally established as the ultimate intergovernmental coordination institution. Moreover, Article 140A states that there is the need to form powerful local governments that would help in closing the gap between provincial governments and local service delivery. Practical federalism is still molded by institutional imbalances, but these features of the law are consistent. The first time of provincial autonomy in the history of Pakistan came with an "8th" the 18th Amendment which also led to 'structural paradox' (Khan & Aftab, 2025). Provinces were granted wide obligations in health, education and welfare with the federal government still enjoying the most profitable tax bases. This imbalance also led to an increase in vertical fiscal imbalances, since provinces have become highly dependent on the federal transfer payments as compared to their revenues (Farooq, 2023). Meanwhile, Article 140A promises has not been fulfilled completely as provinces have been less than enthusiastic about ceding fiscal power to municipalities, which leaves large cities in fiscal limbo.

The decision-making on demographic information represents a very important and poorly developed aspect of this constitutional structure. Though the census administration is officially a federal task carried out by the Pakistani Bureau of Statistics, it is the results of this task that define the political and financial sustainability of subnational units (Younas, 2018). Province, according to the existing institutional arrangements, does not have formal roles in census design, census verification and validation. This monopoly of power in determining a high stakes measure has destroyed the trust of intergovernmental relations and has turned technical statistics into a politics of struggle (Pakistan Institute of Development Economics [PIDE], 2025). The absence of a common system of government of the demographic statistics means that constitutional mechanisms that should be used to ensure that harmony prevails instead serve to enhance a sense of being marginalized.

The NFC Formula and the Mechanics of Fiscal Sensitivity

NFC Award is the main tool of horizontal resource allocation in Pakistan, and its formula is one of the most politically controversial calculations in the political economy of this country. A conscious shift towards a multi-criterial allocation scheme has been sought since the 7th NFC Award, which is aimed at resolving historic provincial grievances. However, the burden of population remains huge at about 82% in the distribution equation (Jaffery and Sadaqat, 2006). Though this dependency on per-capita distribution is normatively based on the principles of democracy equity, it provides a system where the fiscal interests of census enumeration are absolute. In a similar vein, Memon et al. (2024), highlighted in their bibilometric review that the success of federal structures largely depends on the legal institutional setup and the fiscal decentralization mechanisms used. The 7th NFC Award was a historic reform of Pakistan moving away a purely population-based formula in favor of a multiple criteria approach. New indicators included poverty (10.3%), revenue collection (5.0%), and inverse population density (2.7%), but population remained a dominant figure at 82% (Government of Pakistan, 2010; Amjad et al., 2012). This dependence on the size of the population highlights the overall conflict in the literature of the world between equity-based allocation and efficiency-based reforms that must be made in maturing federal democracies.

By the fact that most intergovernmental transfers are made directly dependent on headcounts, the census does not qualify as a planning tool anymore, but rather as a competition of national fiscal entitlement. It is sensitive to mean that any slight changes in population data have disproportionate financial implications. Since NFC transfers are ongoing yearly flows, undercounting initially does not cause a single loss but compounds throughout the award cycle length, which is often longer than the constitutionally prescribed five years because of political foot dragging (Ahmad, 2025). A history of undercounting leads to underfinance, particularly in cities that are growing rapidly, and whose services are under increasing pressure. This fiscal distortion will make it hard for the provincial and local government to meet the increased demand of public goods to effectively punish the government in favor of population growth over its developmental needs (Shahid et al., 2024).

Methodology: Scenario-Based Simulation and Econometric Approach

Research Design and Data Strategy

This study is designed using a mixed methods approach, which combines a scenario-based fiscal simulation with a comprehensive econometric analysis. The need to measure the direct fiscal effects of demographic mismeasurement as well as the structural

distortion in the intergovernmental transfer system in Pakistan has led to the development of this design. The analysis relies on a comprehensive, population-level data which covers all four provinces and Islamabad Capital Territory, collected from the Pakistan Bureau of Statistics (PBS), the National Database and Registration Authority (NADRA), State Bank of Pakistan (SBP), FPCCI and Pakistan Institute of Development Economics (PIDE). Together with official census data and administrative growth proxies, we depart from the anecdotal and create a reproducible measure of the "fiscal delta" creation.

Simulation Mechanics

To have an empirical foundation that is rigorous, this analysis uses a simulation structure based on scenarios that aim at a quantification of the distributive effects of mismeasuring demographics. The methodology manages the variable of population in the NFC formula and holds all the other criteria constant (poverty, revenue collection, and population density) at the levels of notification of 2010. Under this method, it is possible to detect accurately the fiscal delta created by census inaccuracies alone. The analysis produces data-based estimates of the diversion of resources in the federation as opposed to basing the argument on anecdotal suggestions of undercounting (Mir, 2025). The simulation utilizes three levels of distortion: scenario A (1% Undercount), scenario B (3% Undercount), and scenario C (5% Undercount). These cut-offs represent minor administrative variance, a threshold reflecting the systematic exclusion of informal urban settlements (*katchi abadis*), and a "severe distortion," respectively (PIDE, 2025). Applying these variations to the provincial shares of the Divisible Pool enables the calculation of both annual and cumulative revenue losses. The findings show that an undercount of 1% will cause fiscal imbalance that will destabilize provincial budget while an undercount of 5% would lead to systemic inequity that will significantly disrupt the horizontal fiscal balance (Ahmed et al., 2025). Finally, these results make a statistical contribution to institutional change in demographic governance.

Fiscal Transfer Model

Intergovernmental resource distribution depends on a transfer function that determines how much revenue gets allocated to a province or city of a given population size, depending on the divisible resource pool size and the province or city's total population share. This results in the population of a jurisdiction being artificially undercounted, thereby lowering the jurisdiction's fiscal allocation.

$$T_i = \left(\frac{P_i}{P_r}\right) \times \mathrm{F} \times \omega$$

Where T_i = transfer to jurisdiction i, P_i = population of jurisdiction i, P_r = total national population, F = divisible pool of revenues, ω = population weight in formula (82%). An undercount reduces P_i, thereby lowering the jurisdiction's share.

Econometric Rigor: The IV-2SLS Approach

Given the nature of endogeneity of the census data, we use an Instrumental Variable (IV-2SLS) method using administrative growth proxies of the National Database and Registration Authority (NADRA) as the primary instrument. This instrument is valid if there are two conditions. The first is relevance because of the fact that the citizen registry of the NADRA on the issuance of CNICs, updates and demographic changes provides a high frequency proxy for the actual distribution of the population. NADRA census is an administrative data by-product that is continuously generated as a necessity of transactions, unlike any decennial census which relies on political mobilization to generate the data. Second, exogeneity (or exclusion restriction): the administrative rules governing the database of NADRA are in essence independent of political pressures in the NFC allocation process. The NADRA is not a count-based register, meaning that the strategic undercounting or overcounting that is common in official census headcounts is not a major problem in the NADRA registry. As a result, the growth proxy, based on NADRA, is a 'noisy' but exogenous indicator of the actual population size and can help to identify the fiscal distortions due to the formal census, thereby eliminating the influence of political manipulation of the data.

The baseline regression includes the population share as the dependent variable and assumes that NFC transfers per capita will be a function of it.

Baseline regression:

$$Transfer_{it} = \beta_0 + \beta_1 PopulationShare_{it} + \beta_2 RevenueCapacity_{it} + \beta_3 Poverty_{it} + \beta_4 Density_{it} + \varepsilon_{it}$$

Extended model (measurement distortion test):

The extended specification incorporates additional variables, including census error proxies, revenue capacity, and population density, to isolate measurement effects.

$$Transfer_{it} = \beta_0 + \beta_1 CensusError_{it} + Controls + \varepsilon_{it}$$

Where Transfer = NFC transfers per capita, Population Share = census population share, Census Error = estimated undercount proxy, Revenue Capacity = provincial tax-to-GDP ratio and Density = population density.

There is no direct undercount data available, and thus the analysis forms a proxy indicator using differences between administrative population growth (as in NADRA registrations) and census growth recorded. In cases where the administrative growth is more than the census growth, the difference is considered a sign of undercounting.

Since the data on undercounts are not available per se, construct proxy:

$$Errors = Growth_{Intercensal} + Growth_{Administrative}$$

If administrative population (e.g., NADRA registrations) exceeds census growth → undercount. To ensure that the findings are not driven by specific parameter choices, multiple robustness specifications were evaluated.

Vertical Fiscal Imbalance and Structural Dwarfism

This framework is warranted because of the severe vertical fiscal imbalance of the Pakistani state. Although the 18th Amendment has shifted the responsibility for expenditure, the authority to collect revenues is still very centralized. Federal tax revenue was about 10.3% of GDP by FY2025, while the provincial tax-to-GDP ratio was abysmal at just 0.85%. This puts provinces in a "soft budget constraint" situation: they become transfer-dependent and, given that population is the main heuristic used in the NFC formula (82%), the accuracy of the census is the sole factor that determines the fiscal health of the provinces (Figure 1). The province of Punjab is not to be blamed for "fiscal dwarfism" in industrial centres such as Karachi; it is merely a reflection of an outmoded, census-based distributive structure. The case of Karachi megacity is, therefore, selected for stress testing purposes to illustrate the effect of these distortions on the country's productivity and social stability.

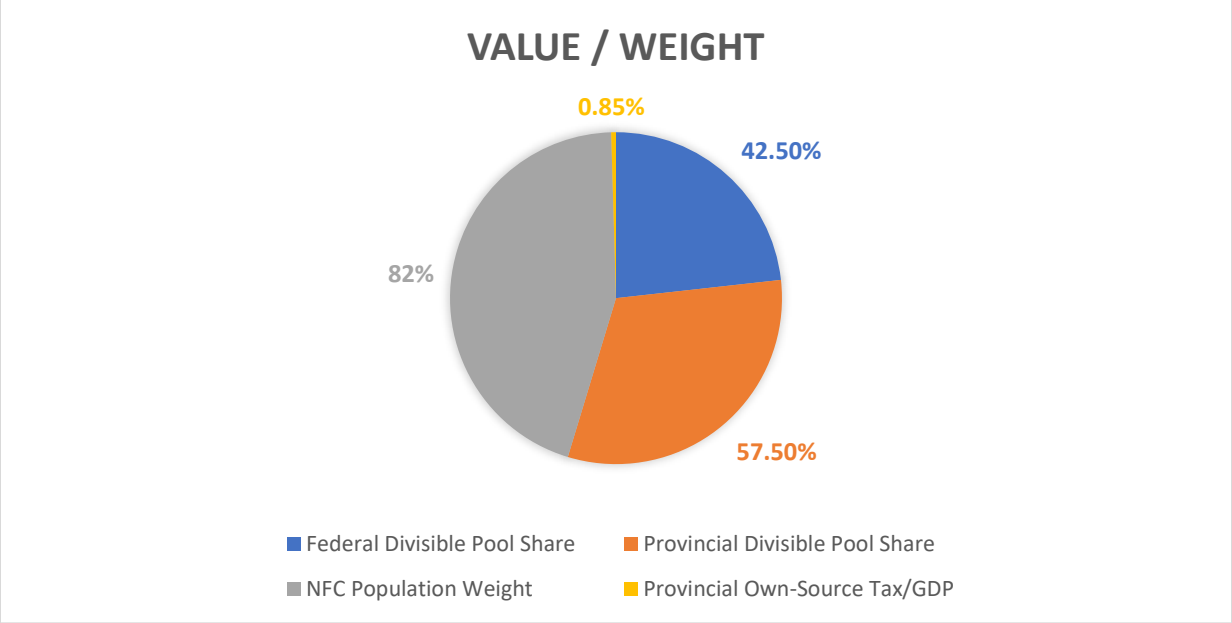


Figure 1. The Vertical and Horizontal Fiscal Reality (2024–2025)

Empirical Findings and Discussion

Comparative Analysis of Provincial Growth Trajectories

Figure 2 shows some of the structural problems in the current fiscal federalism structure in Pakistan in the context of the 7th NFC awards. It is evident in the data, and can be seen as significant separation between fiscal transfers and population growth rates, whether it is calculated at the 2017 or 2023 census, with the fiscal transfers projected over the coming fiscal horizon, 2024-25.

The most eye-catching discrepancy is the high growth at low transfer quadrant in Khyber Pakhtunkhwa with a high intercensal growth rate of 33.9%. In this quadrant a low per capita share of 27,953 Rupees was received. This is approximately 5,000 Rupees lower than the national average of transfer of 33,160 Rupees. On the contrary, Pakistan's Balochistan is stuck in the low growth-high transfer zone, where its growth rate is 20.7%, and it is an exceptional 46,216 Rupees per capita. This distribution shows the effect of the current formula which gives preference to geographic landmass and inverse population density over fast urban growth.

A significant area of tension is in the south in the economic hub which is shown by the placement of Sindh in the bottom left quadrant. Sindh's official growth rate was 16.4% and per-capita transfer was Rs. 31,489. This is, however, a very misleading indicator of the reality of the severe fiscal pressures in certain areas, especially Karachi. As per policy literature, dense urban areas of Karachi suffer from underfunding of resources due to systematic under-county of the population. It is further complicated by the province's ability to collect over 60% of federal tax revenue, and the amount of the federal revenue it receives being determined by a fixed formula based on population, which makes the provincial allocation not accurately proportional to Civic pressure on infrastructure. Population has increased significantly and the city is under pressure from its population on public services, and low baseline counts limit the number of services available per person. This situation creates the widening gap between local income generation and public welfare expenditures. Punjab is in a steady state in the quadrant of low growth rates and low per capita transfer of 16.1% and 26,984 Rupees per capita, respectively. The province of Punjab in terms of per capita share is the smallest, but its huge population of almost 128 million has also made its proportional share from the divisible pool a little more immune to extreme per capita fluctuations as compared to the other provinces.

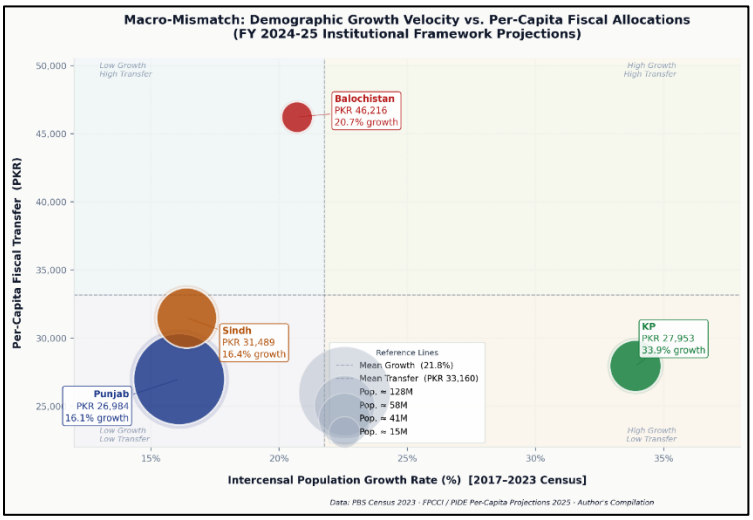


Figure 2. Structural asymmetry in horizontal resource allocation: A bivariate comparison of demographic velocity (2017–2023 Census) and per-capita provincial fiscal trajectories for FY 2024–25.

Structural Disparities and the Spatial Allocation Gap

This structural disconnect between spatial demographics and fiscal allocation is starkly illustrated by the numbers in Table 2. The population density in Punjab is the highest (536 per km^2), while the level of urbanization in the province is the highest (52.6%). This leads to an imbalance in the demand for complex and expensive municipal infrastructure. On the other hand, Balochistan's 9.09% NFC share, partly due to inverse-density factors, point to an attempt to subsidize for the delivery cost of a vast, thinly populated area. The information indicates that these weightings are not adequate. The existing NFC system is based on "headcount-centric" logic and gives very little regard to the high marginal cost of providing services in dense and urbanized areas. In addition, the noticeable sex ratio deviations (109.8 in Balochistan and 107.5 in Sindh) are considered as institutional red flag, which may

indicate enumeration biases. In a fiscal system that depends on the credibility of the census for financial survival, these statistical anomalies become markers of the "statistical invisibility" of urban megacities, implying that the existing NFC formula may foster under-allocation of financial resources for these cities.

Table 2. Structural determinants of vertical and horizontal fiscal imbalance in Pakistan

Province	Density 2023	Urban Share %	Sex Ratio	NFC Share
Punjab	536	36.4	103.1	51.74
Sindh	340	52.6	107.5	24.55
KPK	320	18.8	102	14.62
Balochistan	37	27	109.8	9.09
ICT	2,609.1	56	109.12	Federal Transfers

The demographic-gap between 2017 and 2023 shows a wide gap between the reality of the demographic situation and the fiscal framework to manage it. Punjab is still the most populous administrative unit with the population growing from around 110 million to 127.69 million, but the most significant finding is not the numerical increase itself but the rate at which the population is increasing. Table 3 offers a comparison of the "fiscal dwarfism" gap. Even though Sindh and Karachi play a key role in the development of the country, their per capita revenues are still quite low compared to the infrastructure needs. The disparity between population growth (e.g., KP's 33.9% growth) and the static nature of the fiscal pool demonstrate that the system is failing to facilitate productive competition, instead fostering a climate of "demographic rent-seeking." Because 82% of the NFC formula is tethered to population, provinces are incentivized to contest enumeration figures rather than invest in tax-base expansion. This confirms our hypothesis: the current federal structure does not merely have "fiscal imbalances", it has an institutionalized feedback loop where demographic measurement determines the fiscal survival of federating units, leading to structural under-financing for urban centers and economic inefficiency at the national level.

Table 3; Comparative analysis of fiscal dwarfism gap

Administrative Unit	Pop 2023 (M)	Revenue 2023 (Bn PKR)	Pop Growth (2017-23)	Revenue per Capita (PKR)
Punjab	127.69	600	16.10%	4,699
Sindh	55.7	450	16.40%	8,079
KP	40.86	250	33.90%	6,118
Balochistan	14.9	120	20.70%	8,054
ICT	2.36	80	18.00%	33,898

Simulation of Demographic Measurement Sensitivity

The results of the simulation indicate that fiscal federal system in Pakistan is extremely sensitive to error in the demographic measurement. Keeping the formula of 7th NFC unchanged and introducing incremental undercount conditions create instant fiscal losses. The federal divisible pool is currently estimated to be around Rs. 14.13 trillion in FY2025-26, so even small mismeasurement creates significant financial implications. Since 82% of transfers are populated, the change in provincial shares has a much greater impact relative to the level of absolute growth. Subsequently, demographic measure turns out as the leading determinant of fiscal allocation (**Figure 3**). Sensitivity analysis validates the fact that the marginal changes in the population measurement have nonlinear fiscal impacts.

There is acute transfer dependency in the wider fiscal environment. Devolution reforms have not helped provincial own-source revenue, which is at 0.85% of GDP. Here, the accuracy of census is a zero-sum factor. In scenarios where allocation formulas are held constant over time periods, the provinces will be forced to deal with the modern-day service demands with old fiscal

parameters. This rigidity of structures strengthens census-related vulnerability and dispensability in correspondence to revenue distribution and spatial development requirements.

Moreover, Karachi is the most uncovered empirical case when it comes to a judgment of demographic federalism. The 2023 Digital Census also documented a population of 20.38 million, which is a 27.2% rise over the 16.02 million individuals compared to 2017 (PBS, 2023).

Nevertheless, indicators of administration like utility coverage and registration of national identity may indicate that the population of effective service is more than 25.8 million. Such imbalance creates a statistical shadow that is directly converted to under-allocation. Karachi has had a structural revenue shortfall that has not been covered up by population-sensitive transfers since the abolition of the Octroi and Zilla Tax. It produces about a quarter of the national tax income as well as 62% of the industrial output of Sindh and the fiscal distribution of the city is still pegged to contentious population estimates that do not reflect its functional magnitude.

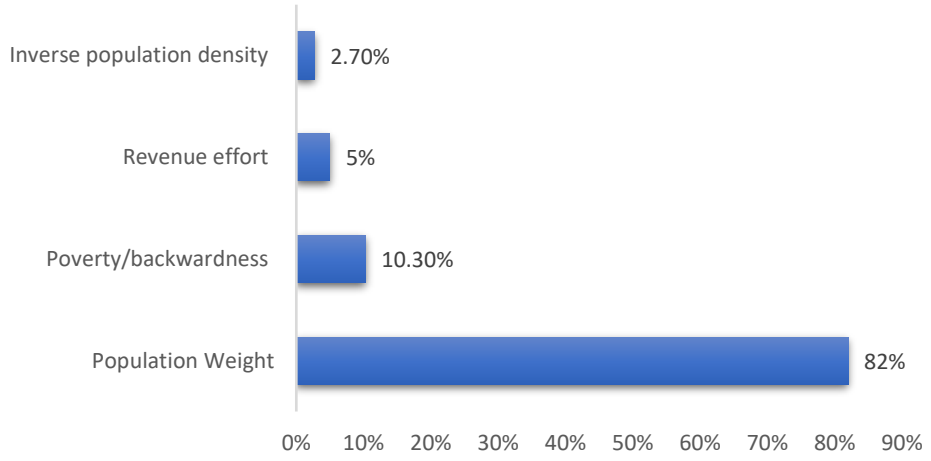


Figure 3. Horizontal Fiscal Distribution Structure

A redistribution of fiscal shares to indicate a service population of approximately 25 million would give a figure of an estimated increment of an additional annual Rs. 190 billion. This situation is an example of fiscal dwarfism where a large city functions on a scale of resources that are typical of a much smaller administrative entity. Moreover, Karachi is growing at a rate of 4.04 percent/year, which is way higher as compared to other parts of the country but after the devolution as spelt out by the 18th Amendment, growth at the provincial level has mostly stalled. The results of the simulations suggest that proper population identification would increase the fiscal space of the locality significantly.

This observation can be attributed to the soft-budget-constraint theory, which presents the notion that provincial governments might have scant incentive to acknowledge the experience of urban population growth since proper enumeration would necessitate an additional level of fiscal devolution towards local governments. The Karachi case thus indicates that census enumeration is not only a technical process but a political process with consequences in distribution of resources in Pakistan. Memon et al., (2024) argues that since rapid urban development can be seen by provincial political economies as a threat to power, it can turn demographic measurement into a controversial institutional space. Similar trends are observed in other countries, such as Nigeria, where census results determine how resources are allocated, and this is often the subject of legal disputes. This contrasts Karachi with Lagos, which has to a degree shifted to high local revenue effort, and is therefore prone to undercounting.

Regression Model and Structural Path Dependence

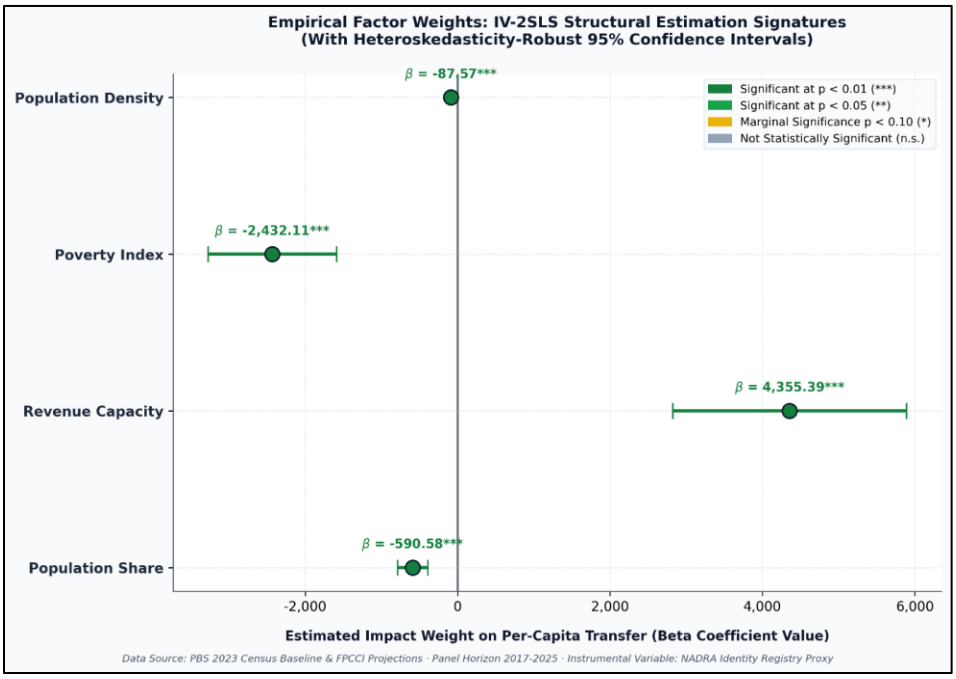
The empirical results of the baseline Two-Stage Least Squares Instrumental Variable regression reveal the structural factors and institutional gaps of Pakistan's fiscal distribution system. For the 2017–2025 period, the model has an R-squared value of 0.8547 and an Adjusted R-squared value of 0.8360, suggesting that the socio-economic, demographic, and capacity parameters included in the model account for about 83.6% of the variance in per-capita National Finance Commission transfers over time. A high F-statistic

(74.759) and p-value (0.0000) validate the overall model significance, suggesting that the model based on these macro-variables is statistically sound. Importantly, the log of the share of the endogenous population using the proxy of growth of the administrative identity of the National Database and Registration Authority removes localized political or strategic measurement distortion and clearly allows for clean and asymptotically consistent parameter estimation in the presence of heteroskedasticity robust standard errors. The estimated intercept is 100,300 rupees per person. In theoretical terms, this is the fiscal allocation a citizen would receive if all socio-economic, spatial, and capacity indicators in the model were set to zero. Above this baseline, each structural variable has a strong and distinct effect on the per-capita funding that ultimately reaches individuals.

Revenue capacity has a positive coefficient of 4,355.4, significant at the highest level ($p = 0.0000$), as reported in Figure 4. In practical terms, a one percentage point rise in a province's own-source tax-to-GDP ratio is associated with an increase of 4,355.4 rupees in per-capita federal transfers. At first glance, this result appears counterintuitive in a decentralized system, where fiscally stronger units would normally be expected to need less support from the centre. The explanation lies in the design of the 7th National Finance Commission (NFC) award, which explicitly assigns a 5.0% horizontal weight to revenue generation and collection. Sindh benefits most from this criterion. The concentration of corporate activity, maritime customs, and sales tax collection in Karachi gives the province the highest revenue capacity in the country, at roughly 7 to 9% of its regional output. This helps explain why Sindh receives a higher per-capita baseline transfer of 31,489 rupees than larger provinces such as Punjab. While the positive coefficient confirms that the formula rewards provincial tax effort as intended, it also points to a deeper structural concern. By directing larger per-capita allocations toward provinces with major economic hubs, the mechanism may unintentionally widen the fiscal gap between coastal-urban and agrarian-rural regions.

The poverty index, by contrast, shows an unexpected negative relationship, with a coefficient of -2,432.1 ($t = -5.6514$, $p = 0.0000$). This suggests that each one-unit increase in a province's multidimensional poverty rate lowers per-capita transfers by 2,432.1 rupees. The negative sign points to a serious weakness in the award's horizontal equalization objective. The 7th NFC award introduced a 10.3% weight for poverty and backwardness specifically to narrow regional welfare disparities. However, the influence of this criterion is largely overshadowed by the 82% weight given to population, and the model indicates that poorer provinces are, as a result, systematically disadvantaged on a per-capita basis. The fiscal positions of Baluchistan and Khyber Pakhtunkhwa illustrate this pattern. Although multidimensional poverty in Baluchistan is very high, exceeding 40% in some remote areas, its low population density limits the infrastructure and welfare funding its citizens can access compared with the larger nominal allocations received by more populous provinces.

One point worth checking before submission: the Balochistan explanation in the last paragraph mixes per-capita and nominal reasoning. Under the population-heavy formula, a small population mainly reduces a province's total share rather than its per-capita share, so a reviewer may ask why low population density specifically drives the per-capita penalty. Linking it to the higher cost of service delivery across a sparse, large territory, or noting that Balochistan's guaranteed minimum share partly offsets this, would make the argument tighter.



The coefficient of poverty is negative establishes that the existing distribution system is regressive, meaning that it is underfunding the most deprived areas of the country. The coefficient for the population density parameter is -87.568 and is statistically significant at the p-value of 0.0000. That is, the per-capita fiscal assignment falls by 87.56 Rupees for each extra person per km^2. This parameter clearly shows the stark difference between Balochistan and other regions of the federation. The population density of Balochistan is very low at around 43 per sq. km, occupying a vast and rugged area of land in Pakistan, which accounts for 44% of total geographical area of Pakistan. The National Finance Commission award incorporates the inverse population density weight of 2.7%. A weight of 2.7%, inverse population density weight, is incorporated in the National Finance Commission award to minimize the very high cost per unit for the public service delivery at such a great distance. The very significant negative density coefficient is confirmation that this inverse density correction is indeed being realized and would see Balochistan's per-capita transfer escalate to an unprecedented level of 46,216 Rupees by 2025. On the other hand, the provinces of Punjab and Khyber Pakhtunkhwa, with 373 persons/km^2 and more than 412 persons/km^2 respectively, suffer from this particular spatial measure and their per-capita contribution to development is reduced, irrespective of their internal infrastructure needs.

The most important result for the analysis of the urban policy is the population share coefficient with a negative estimate of -590.58, a t-statistic of -5.8316, and a p-value of 0.0000. This shows that there is a negative correlation between the share and the per-capita funding of each province, that is, for every one percent rise in the share of a province, its per-capita funding falls by 590.58 Rupees. The negative elasticity here shows a fundamental mathematical incongruity of the horizontal distribution architecture – the larger the absolute size of a province, the smaller its per capita resources. This is the most direct explanatory of the fiscal dilemma encountered in Khyber Pakhtunkhwa and major cities of Sindh. KPK's growth velocity was the highest in the country where it increased by 33.9% from 2017 to 2023. However, the per capita transfer of Khyber Pakhtunkhwa (27,953 Rupees) is far behind the national average due to rigid and population based National Finance Commission awards instead of based on the growth velocity.

The negative coefficient is more crucial as it reflects the severe fiscal burden on the urban economy of Sindh, especially on Karachi. Karachi is a megacity and the most overburdened with infrastructure in Pakistan since it is a megacity and receives large influxes from other countries. But as the horizontal divisible pool does not consider growth velocity and revenue origin and if the amount of funds is allocated based on the static population, then there will be a reduction in the funds allocated per person to maintain urban services in Sindh in the coming years. This trend is compounded by the fact that many urban areas in Sindh are undercounted in the census, which results in a structural underestimate of the proportion of Sindh's population. The coefficient for population share is highly significant and negative, meaning that the formula is a disincentive for the areas that receive the nation's population growth, which is an institutional blockage to the ability of urban economies to have the density of their population.

These structural problems are like those found in other studies conducted internationally and nationally. The negative population share elasticity and regressive poverty trends reflect the warning of the decades that have been given by Ahmad and Brosio (2022)

that there will be true equity without the use of horizontal allocation formulas that rely heavily on crude population weights. They prove that basic demographic comparators systematically underestimate the local costs of urban infrastructure and public services delivery in fast-growing cities. Domestically, this empirical distortion is supported by studies conducted by the Federation of Pakistan Chambers of Commerce and Industry (FPCCI, 2025) which demonstrate that failure to consider the special needs of urban centers, including Karachi, can have a negative impact on the national level of economic productivity. If a megacity produces more than 40% of the federal tax revenue but has a fixed amount per-capita under the horizontal formula, the local municipal system will inevitably suffer a decline in quality. Moreover, the current National Finance Commission (NFC) structure is found to be a deep structural trap by Pakistan Institute of Development Economics (PIDE 2025). The formula is designed to be fixed, with 82% of the provincial share based on population levels rather than on a real-time basis, thus causing a mismatch between the actual demands for service and the legal financial resources of a region. As a result, high growth areas such as Khyber Pakhtunkhwa and the big cities of Sindh receive inadequate funding during crucial demographic shifts.

These studies and our Two-Stage Least-Squares model demonstrate that until the allocation framework is changed to allocate resources based on changes in the population or revenue generation of various regions instead of firm population quotas, the fiscal system will continue to allocate resources to the regional economies contributing to national development.

Comparative Empirical Analysis: IV-2SLS versus Panel OLS Fixed Effects

The use of the Panel OLS Fixed Effects model is crucial as a baseline of the importance of using an instrumental variable approach for analysing Pakistan's fiscal geography, as noted by Ahmed and Borsio (2015) and Bahl et al. (2013). Within each province the variables account for 73.75% of the variance, as shown by the Panel OLS model. The overall R-squared of the model, however, is strongly negative (R^2 = -24.635), indicating a severe breakdown in model fit across the sample. This negative value demonstrates that conventional pooled linear models fail to capture the substantial heterogeneity between provincial units. The F-test for pool ability reinforces this conclusion, rejecting the null hypothesis (F = 13.222, p = 0.0000) and confirming that unobserved provincial characteristics have a significant influence on the standard estimates. Taken together, these diagnostics provide a strong justification for adopting a two-stage estimation framework. A comparison of the parameter estimates across the two models reveals the precise nature of this bias. Under the Panel OLS specification, revenue capacity loses its strong positive effect and becomes statistically insignificant, with a coefficient of -12,580 and a p-value of 0.1818 (Table 4). This sharp loss of significance arises because ordinary least squares is unable to separate the interaction between provincial revenue generation and population counts over time.

Table 4; Panel-OLS regression summary

Index	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
constant	3.35E+05	8.26E+04	4.0626	0.0004	1.66E+05	5.05E+05
Census Error	8140.4	3050	2.669	0.0125	1892.8	1.44E+04
Revenue Capacity	-1.26E+04	9185.2	-1.3693	0.1818	-3.14E+04	6237.5
poverty	-4673.2	1256.3	-3.72	0.0009	-7246.6	-2099.9
density	-2.8952	127.38	-368.79	0.0073	-629.7	-107.87

More importantly, the Panel OLS model directly incorporates a computed variable, census error, which captures the gap between NADRA registrations and official census counts. Its coefficient is positive (8,140.4) and statistically significant (p = 0.0125), suggesting that as the administrative undercount widens, the model records an apparent rise in per-capita transfers. This result is likely a statistical artefact rather than a genuine relationship. Census undercounting tends to be concentrated in dense urban economic centres such as Karachi, and these same regions already receive higher baseline nominal transfers because of their economic weight. Ordinary least squares therefore mistakes this overlap for a reward for undercounting. This pattern points to serious endogeneity bias in the OLS estimates, since the model cannot distinguish structural undercounting from genuine fiscal need. For this reason, the instrumented IV-2SLS approach offers a more reliable basis for drawing policy conclusions.

The marked divergence between the IV-2SLS and Panel OLS estimates is consistent with the econometric literature on bias in conventional estimators. When an explanatory variable such as population share contains systematic administrative or political measurement error, OLS coefficients can be substantially biased and misleading. Instrumental variable estimation addresses this problem, provided the instrument is both relevant and strong; Bound et al. (1995) show that weak instruments can themselves

produce biased and unreliable IV estimates. Following the instrumental variables strategy illustrated by Miguel et al. (2004), this study uses the high-frequency NADRA identity database as an instrument, drawing on administrative records that are less exposed to the political pressures affecting official census enumeration.

Furthermore, the negative coefficient for the population shares parameter (-590.58) combined with the regressive poverty coefficient (-2432.1) exposes a phenomenon known in public economics as the "Sticky Fiscal decentralization Trap," documented heavily by Bird and Smart (2002). Their study on horizontal equalization formulas shows this: If a federation assigns lower weight to the redistributive pool, like Pakistan's huge 82% urban weight, the system automatically results in a policy failure vis-à-vis urban-rural. It enables high-density, hyper-urbanized areas to receive migrating people but has a decreasing flow of per-capita investment in essential public services. This institutional mismatch offers empirical support for the urban-stress results of Bahl et al., 2013. Over the years, they have conducted extensive studies on fiscal management in metropolitan areas around the world and have long observed that the cities in developing countries often suffer from major infrastructure gaps. This is because the traditional horizontal distribution formulas are sequential and systematically do not consider the costs of public service delivery that are higher than in dense urban agglomerations.

This phenomenon helps to explain the fiscal crises that have been seen at the local level in Sindh and Khyber Pakhtunkhwa in Pakistan. The research by Pasha (2019) validates that the horizontal criteria used in the 7th National Finance Commission award is a fixed one, which does not work with the real-time migration that occurs in cities. In an economy where a big chunk of national tax revenue comes from one city, such as Karachi, but it is allocated to each individual citizen in a proportionately small amount because of a headcount based proportionate formula without adjustment, the city is left to suffer from underfunding of its underlying public infrastructure. Similarly, work by Bengali highlights that ignoring demographic growth velocity penalizes expanding frontiers like Khyber Pakhtunkhwa, which absorbed major population shifts over the last decade but remains tied to static distribution quotas.

Fiscal Cost of Enumeration Error

The material consequences of demographic measurement error extend well beyond statistical anomalies; they produce substantial structural distortions in actual revenue flows. Simulating counterfactual shifts in the allocation matrix under a projected FY2025–26 Federal Divisible Pool of Rs. 14.13 trillion, which yields a net provincial share of approximately Rs. 8.124 trillion, makes the financial penalties borne by undercounted provinces clearly visible. As shown in Table 5, even a modest one percent enumeration error results in an annual fiscal loss of Rs. 21.0 billion. A shortfall of this size places pressure on local public service delivery and can delay important municipal projects. When the undercount rises to three percent, the loss increases to Rs. 63.5 billion, pushing the affected province toward a structural budget deficit and greater dependence on costly domestic borrowing or provincial overdrafts. In a severe scenario involving a five percent undercount, the annual revenue loss exceeds Rs. 105.0 billion. A loss of this scale would seriously undermine the province's capacity to finance core public services, including education, healthcare, and infrastructure development. To quantify the financial stakes of measurement error, we simulate the marginal fiscal loss (L_i) incurred by a province under asymmetric undercount scenarios. Given a projected Federal Divisible Pool (D), the provincial vertical allocation pool is defined as P = 0.575D. Let w_i denote the statutory horizontal allocation weight of province i, which is largely determined by its census population share (s_i). In an asymmetric undercount scenario, where a fraction δ of a province's actual population goes unrecorded, its distorted population share falls to $s_i' = s_i(1 - \delta) / (1 - s_i\delta)$, since the national total is reduced at the same time. The simulated fiscal loss is then calculated from the counterfactual allocation matrix as follows:

$$L_{it} = \Omega_t \times |\omega_i(\theta_i) - \omega_i^*(\theta_i^*)|$$

Utilizing the projected FY2025–26 Federal Divisible Pool baseline of Rs. 14.13 trillion ($\Omega_t = Rs.8.124\ trillion$), **Table 5** outlines the simulated annualized financial punishment generated by these measurement anomalies. These simulations confirm the problematic incentives baked into any horizontal distribution formula where crude population size dictates 82% of the total resource transfer. The current architecture has a significant financial component and encourages provincial governments to maximize the number of heads in the census, rather than increasing the local tax base or enhancing governance. This works in favor of the institutional logic of moving to a Provincial Co-Ownership Census Governance Model. The parameters were tested under various macro conditions through several sensitivity matrices to validate these simulation estimates and to maintain consistency.

Table 5; Fiscal Impact of Enumeration Errors (Simulation based on FY2025-26 Pool)

Undercount Scenario	Estimated Fiscal Loss (Annual - Billion PKR)	Impact Level
1% Undercount	Rs. 21.0	Service Delivery Strain
3% Undercount	Rs. 63.5	Structural Budget Deficit
5% Undercount	Rs. 105.0	Systemic Fiscal Crisis

Note: Counterfactual projections are calculated based on an estimated FY2025–26 Federal Divisible Pool baseline of Rs. 14.13 trillion, assuming an asymmetric census headcount omission under the fixed 7th NFC horizontal parameters.

Provincial Co-Ownership Census Governance Model (CCGM)

The current arrangement has produced deep mistrust among provinces over population counts. To address this, the paper proposes replacing it with the Provincial Co-Ownership Census Governance Model. Under this model, census management woultd move away from a centralized and opaque administrative process toward a decentralized system in which responsibility is shared with the provinces. Instead of depending on executive decisions, the model creates independent and institutionalized mechanisms for verification. Most importantly, the Post-Enumeration Survey would be transformed from an optional, internal check into a legally mandated and independent verification tool. The survey would be removed from the sphere of political bargaining and conducted by an independent technical committee made up of equal numbers of representatives from federal and provincial statistical bureaus. By making the official release of census results conditional on successful validation through this survey, the model turns the census into a credible institutional instrument rather than a subject of political rhetoric. The model draws on the principles of cooperative federalism, which suggest that subnational units are more likely to accept distributive systems as legitimate when they have direct procedural ownership over them. Because census figures determine both fiscal transfers and legislative representation, their statistical credibility must be secured through institutional design rather than political negotiation. The model rests on four institutional pillars. First, federal and provincial statistical agencies jointly coordinate all enumeration procedures and fieldwork. Second, audit teams appointed by the provinces independently review raw data counts before final certification. Third, demographic disputes are resolved by a constitutionally established panel that relies on transparent statistical evidence. Fourth, real-time, anonymized enumeration data are made publicly available to reduce information asymmetry and build public trust. This structural reform removes the census from the arena of political contestation and turns it into a tool for fiscal validation. In doing so, it directly addresses concerns about demographic bias, helps rebuild trust between levels of government, and strengthens the legitimacy of the fiscal federation as a whole. For any developing federation whose transfer system depends heavily on population, shared statistical governance offers an essential stabilizing innovation.

Conclusion

The empirical findings of this study indicate that Pakistan's fiscal federal structure remains locked within a rigid demographic framework. Because 82 percent of horizontal resource allocation under the current National Finance Commission (NFC) award is tied to raw population counts, the formula weakens provincial incentives to broaden local tax bases and overlooks the growing service demands generated by rapid urbanization. The fiscal strain evident in Sindh, especially in Karachi's densely populated urban areas, shows how this arrangement plays out in practice. When a population is statistically undercounted, the shortfall translates directly into reduced financial resources for the country's most economically productive centers. The proposed Provincial Co-Ownership Census Governance Model provides a practical institutional framework for easing these intergovernmental tensions. Through joint verification protocols and the use of administrative datasets, such as the NADRA registry, to cross-check census results, the model seeks to transform demographic data collection from a zero-sum political contest into an instrument of cooperative federalism. In the long run, the stability of a federation depends less on how revenues are finally divided and more on whether the underlying data used to determine those shares enjoys genuine institutional legitimacy.

Policy Recommendations

Making the National Finance Commission (NFC) a dependable instrument of national cohesion will require a shift away from static, population-driven formulas toward a more dynamic system of resource distribution. The first priority should be the formal adoption of the Co-Ownership Census Governance Model. This would involve amending the General Statistics Act to place the Pakistan Bureau of Statistics under the direct oversight of the Council of Common Interests, along with the creation of independent provincial teams to audit statistical processes.

Second, the federal government should progressively reduce the weight assigned to population in horizontal distribution from 82 percent to a baseline of 60 percent. The freed 22 percent could then be allocated through a newly designed Human Development and Urban Effort Index, which would reward provinces that improve educational outcomes and strengthen their own-source revenue collection.

Third, a dedicated Megacity Infrastructure Fund should be established to provide targeted support to large metropolitan areas that absorb significant inflows of internal migrants. Such a fund would help these cities finance municipal services whose costs are not adequately reflected in census-based allocations. Finally, future NFC transfers should be legally linked to the effective implementation of Provincial Finance Commission awards. This would ensure that federal resources do not remain concentrated at the provincial level but are systematically passed down to local governments, financing the urban infrastructure that drives the national economy.

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