



Vol. 4 No. 2 (February) (2026)

Urbanization, Housing Markets, and Socioeconomic Inequality: Empirical Evidence from Pakistan's Twin Cities of Rawalpindi– Islamabad

Ramsha Mughal

Department of Economics and Agricultural Economics PMAS-AAUR

Muhammad Ishaq

Secretary, Pakistan Agricultural Research Council (PARC)

Email: muhammadimpa@yahoo.com

Dr. Abdul Rehman Khan*

Educationist, Researcher and Development Professional; Former Pro VC BUITEMS

Email: arkhan.uw@gmail.com

Muhammad Umair Sohail

Assistant Professor, Department of Mathematics and Statistics, Emerson University

Multan Email: umairsohailch@gmail.com

ABSTRACT

This paper investigates the relationship between urban densification, housing market dynamics, and socioeconomic inequality in the Rawalpindi–Islamabad (Twin Cities) Capital Territory using union-council-level panel data spanning 2001 to 2023. Exploiting historical master-plan zoning instruments and infrastructure investment shocks—including the Islamabad Metrobus corridor and the China–Pakistan Economic Corridor (CPEC) ring-road investments—as sources of exogenous variation in urban density, this study estimates instrumental variable (IV) regressions alongside difference-in-differences (DID) specifications to isolate causal effects. The central findings are threefold. First, a one-standard-deviation increase in population density raises union-council-level median residential property values by approximately 31.4 percent, a magnitude that persists after controlling for income sorting, educational attainment, and spatial proximity to government-sector employment. Second, rising density increases the Gini coefficient within union councils by 3.8 to 5.2 Gini points on average, driven primarily through the displacement of low-income renters in katchi abadis (informal settlements) and the rapid appreciation of regularized owner-occupied housing. Third, the inequality effects are most pronounced in low-income union councils within five kilometres of Islamabad's Central Business District and Rawalpindi's Saddar commercial hub, where housing cost burdens exceed 40 percent of gross income for households in the bottom income quintile. Robustness checks using alternative inequality measures, spatial-lag corrections, and placebo instrument tests leave the core conclusions intact. The results challenge the prevailing narrative that densification uniformly alleviates housing unaffordability in rapidly urbanizing South Asian economies and suggest instead that, absent redistributive policy interventions and inclusive urban planning, urban growth exacerbates rather than attenuates spatial inequality in Pakistan's premier metropolitan corridor.

Keywords: Urban Density, Housing Affordability, Income Inequality, Katchi Abadis, Rawalpindi–Islamabad, Instrumental Variables, CPEC, Union-Council Panel



Vol. 4 No. 2 (February) (2026)

JEL Codes: R21, R31, D63, O18, H72, P25

Introduction

Pakistan stands at a pivotal crossroads of urban transformation. With over 77 million urban residents—representing approximately 36.4 percent of the total population according to the 2023 Pakistan Bureau of Statistics (PBS) Digital Census—and an urbanization rate consistently exceeding 2.7 percent per annum, the country is among the fastest-urbanizing nations in South Asia (Pakistan Bureau of Statistics, 2023; United Nations, 2022). Within this broader demographic transition, the Rawalpindi–Islamabad metropolitan corridor has emerged as the most dynamic, and arguably the most instructive, laboratory for understanding the distributional consequences of rapid densification. The Twin Cities together constitute Pakistan's second-largest metropolitan statistical unit, with a combined population of approximately 7.4 million as of the 2023 Census, and they encompass within their geographic scope one of the most striking juxtapositions of planned affluence and unplanned informality found anywhere in the developing world.

The question motivating this paper—whether urban densification in rapidly growing South Asian cities helps or harms lower-income residents—is not merely an academic one. The Pakistan Housing Authority (PHA) estimates a nationwide housing deficit of 10.3 million units as of 2022, with the backlog growing by approximately 700,000 units annually (PHA, 2022). The Rawalpindi–Islamabad corridor alone accounts for an estimated 1.2 million units of this deficit, a figure that is partly a product of restrictive planning regulation, partly a consequence of speculative land markets dominated by the Defence Housing Authority (DHA) and the Capital Development Authority (CDA), and partly a reflection of the chronic underinvestment in affordable housing finance that has historically characterized Pakistan's housing sector (Noman & Qayyum, 2020; Cheema et al., 2019).

The Rawalpindi–Islamabad metropolitan area offers an unusually instructive setting for revisiting these questions. The two cities constitute distinct but economically integrated administrative units: Islamabad, a purpose-built federal capital created by the CDA under the Islamabad Capital Territory (ICT) Ordinance of 1960, and Rawalpindi, a historic cantonment and commercial city falling under the administrative purview of Punjab Province. This institutional duality—different planning authorities, different land titling regimes, different regulatory frameworks—combined with the spatial proximity of the two cities, creates a near-natural experiment analogous to that exploited by Hale (2025) for Minneapolis–Saint Paul. The divergence in land-use trajectories is further amplified by the China–Pakistan Economic Corridor (CPEC), whose infrastructure investments have differentially stimulated development pressure across the two cities' hinterlands since 2015 (Khalid & Malik, 2021; Siddiqui, 2019).

This paper makes four primary contributions to the literature on urban economics and inequality in South Asia. First, it provides the most granular causal analysis of density-inequality dynamics yet undertaken for a major Pakistani metropolitan area, extending a literature that has disproportionately focused on Karachi (Hasan, 2015; Alimuddin et al., 2004) or on cross-country panels in which within-city dynamics are obscured by aggregation. Second, it uses a novel combination of historical master-plan zoning maps digitized from CDA and Rawalpindi Development Authority (RDA) archives, long-run CPEC infrastructure investment records, and union-council-level panel data from the PBS Household Integrated Economic Survey (HIES) to construct instruments for density that are plausibly orthogonal to contemporaneous income trends. Third, it disaggregates



Vol. 4 No. 2 (February) (2026)

inequality effects by planning zone, housing tenure, and proximity to katchi abadis, revealing patterns of heterogeneity that aggregate regressions inevitably conceal. Fourth, the analysis speaks directly to Pakistan's Naya Pakistan Housing Programme (NPHP) and its successor Mera Pakistan Mera Ghar (MPMG) scheme, asking whether supply-side densification interventions are likely to reduce or exacerbate distributional inequality in the absence of complementary demand-side protections.

The findings carry substantial implications for Pakistan's urban governance architecture. The federal government's 2022 National Urban Policy (NUP) explicitly endorses densification as a strategy for addressing the housing deficit, while the Islamabad Master Plan 2040—currently under revision by the CDA—proposes transit-oriented development (TOD) corridors around the Blue Line Metrobus extension. Understanding whether the density increases stimulated by these interventions are likely to reduce or intensify within-union-council income dispersion—and for which segments of the population—is essential for designing complementary redistributive instruments. The results presented here suggest that density alone is not a remedy for housing unaffordability among the poor; in the absence of targeted tenant protections, affordable housing set-asides, and katchi abadi regularization, urban growth is more likely to worsen the distributional position of low-income renters while benefiting property owners and the upper-middle class.

The remainder of the paper is organized as follows. Section 2 reviews the theoretical and empirical literature with particular attention to South Asian contexts. Section 3 describes the data and measurement strategy. Section 4 presents the econometric framework. Section 5 reports baseline results and robustness tests. Section 6 explores heterogeneity across planning zones and tenure types. Section 7 discusses mechanisms and policy implications for Pakistan's urban governance framework. Section 8 concludes.

Literature Review

Urbanization and Housing Price Formation in Developing Countries

The canonical monocentric city model (Alonso, 1964; Muth, 1969; Mills, 1972) predicts an inverse relationship between distance from the CBD and land values, with density declining monotonically toward the urban fringe. While this framework was developed primarily for North American and Western European cities, its core spatial logic has proven remarkably portable to South Asian metropolitan contexts, where bid-rent gradients have been documented for Karachi (Amjad, 2018), Lahore (Naqvi & Hamid, 2019), and Dhaka (Datta, 2019). The standard supply-side constraints identified by Glaeser and Gyourko (2003) for the United States—statutory restrictions on building height, plot coverage ratios, and minimum setback requirements—have direct analogues in Pakistan's CDA Building Control Regulations and Rawalpindi's Development and Building Standards, which together constrain residential floor-area ratios to levels substantially below what market demand and infrastructure capacity could support in many urban sectors (Hasan & Mohib, 2003).

More recent contributions have refined the supply-constraint picture in ways directly relevant to the Pakistani context. Hsieh and Moretti (2019) estimated that reducing land-use restrictions in high-productivity cities to median regulatory levels could raise aggregate GDP by 2 percent—a figure that has been extensively debated but not overturned. For South Asia, McKinsey Global Institute (2016) estimated that closing the productivity gap between Pakistani cities and their regional peers through improved urban land markets could generate up to \$50 billion in additional annual economic output by 2030. Burki (2019) argued that Pakistan's chronic 'spatial misallocation'—the



Vol. 4 No. 2 (February) (2026)

systematic underutilization of well-located urban land held by military and government institutions—imposes costs on urban productivity that dwarf those arising from private-sector zoning restrictions.

The supply response literature also has direct Pakistani relevance. Mayer and Somerville (2000) and Green, Malpezzi, and Mayo (2005) documented that the elasticity of new construction with respect to price appreciation is systematically suppressed by restrictive zoning—a finding echoed in Noman and Qayyum's (2020) analysis of Islamabad's residential property market, which showed that CDA sector allocation procedures and DHA balloting systems effectively create rationed access to developable land that mimics the effects of growth controls in U.S. suburban jurisdictions. The result is a housing supply curve that is inelastic over broad ranges of price variation, meaning that demand-driven density increases translate primarily into price appreciation rather than quantity expansion—precisely the mechanism identified in Section 5 of this paper.

Housing Markets and Distributional Outcomes in South Asia

The distributional consequences of housing market dynamics in South Asian cities have attracted growing scholarly attention since the early 2000s, though the empirical literature remains far thinner than its counterparts for North America or Europe. The filtering mechanism (Sweeney, 1974; Ohls, 1975), which predicts that new construction at the upper end of the quality distribution eventually frees up lower-quality units for lower-income occupants, has received limited formal empirical testing in South Asian contexts. The conditions required for efficient filtering—a large, competitive rental market, good information flows, and low moving costs—are imperfectly realized in Rawalpindi–Islamabad, where the informal rental sector operates through personal networks with high search frictions, and where *katchi abadi* residents face acute insecurity of tenure that discourages market mobility (Hasan, 2015; Siddiqui & Wahid, 2016).

Against this background, gentrification-adjacent processes driven by public investment have attracted considerable attention. Cheema et al. (2019) documented that CDA's incremental regularization of unauthorized housing in Islamabad's Zone IV substantially increased property values in adjacent formal sectors, generating windfall gains for existing property owners while accelerating the displacement of informal settlers. A similar dynamic has been documented in Rawalpindi's Chaklala and Dhoke Hassu neighborhoods, where proximity to the Rawalpindi Ring Road—a CPEC-linked infrastructure project—has driven land value appreciation of 40–60 percent between 2017 and 2022 according to Federal Board of Revenue (FBR) DC rates adjustments (FBR, 2023). Khalid and Malik (2021) argued that CPEC infrastructure investments more broadly have functioned as regressive spatial subsidies that capitalize into land prices in ways that primarily benefit existing property owners rather than facilitating affordable housing provision.

The tenure dimension of inequality is especially salient in Pakistan. As documented by the Pakistan Social and Living Standards Measurement (PSLM) survey, approximately 52 percent of urban households in the Punjab are renters, compared to approximately 38 percent in U.S. metropolitan areas (Diamond, 2016). This higher renter share means that the asset-income channel through which housing appreciation worsens inequality—identified by Diamond (2016) as a primary driver of welfare divergence between renters and owners in appreciating U.S. markets—operates with greater force in Pakistani cities. The racial wealth gap in U.S. housing has its analogue in Pakistan's *biraderi* (kinship network) and class-based disparities in access to formal property markets, which



Vol. 4 No. 2 (February) (2026)

systematically exclude recent rural-urban migrants and low-income households from the wealth accumulation opportunities available to established urban property-owning classes (Gazdar, 2011; Arif et al., 2012).

The Rawalpindi–Islamabad Corridor in Context

The Twin Cities of Rawalpindi and Islamabad have received substantial attention in Pakistani urban studies, though the economics literature has lagged behind the planning and geography literatures in applying rigorous causal methods. Hasan (2015) provided a comprehensive institutional account of the two cities' divergent planning histories, tracing the CDA's emphasis on low-density planned residential sectors for the administrative and professional elite against Rawalpindi's more organic and commercially integrated growth. Siddiqui and Wahid (2016) documented the spatial distribution of katchi abadis across the corridor, finding that approximately 30 percent of Rawalpindi's population resided in informal settlements as of 2015—a proportion that has changed little despite successive regularization exercises, because the rate of new informal settlement formation has roughly kept pace with regularization activity.

Noman and Qayyum (2020) examined residential property price dynamics in Islamabad using hedonic regression methods applied to FBR transaction data, finding large and statistically significant premiums associated with proximity to the Blue Area commercial hub and to Islamabad Expressway access nodes. However, their cross-sectional design did not permit causal identification of the density effect, and they did not analyze distributional consequences. Qaiser et al. (2021) used satellite-derived land cover change data to document the pace of urban expansion in the Rawalpindi–Islamabad corridor between 2000 and 2020, finding that urbanized area nearly tripled over this period—a rate of land conversion substantially in excess of population growth, implying declining average densities in the urban fringe even as core areas intensified. This paradox of simultaneous densification at the centre and sprawl at the fringe—familiar from the U.S. metropolitan literature (Brueckner, 2000)—creates the geographic heterogeneity that the Section 6 analysis exploits.

Critically for identification, the CPEC ring-road investments that began physical construction in 2016–17 created sharp spatial discontinuities in infrastructure access that differentially affected property markets in Rawalpindi's eastern and southern sectors relative to Islamabad's well-served northern and western sectors. Khalid and Malik (2021) documented that these infrastructure shocks were, by design, routed to enhance connectivity between Gwadar and Khunjerab rather than to maximize welfare in the urban corridor—a political-economy feature analogous to the interstate highway routing documented by Duranton and Turner (2012) for the United States, and one that I exploit as a source of quasi-random variation in local infrastructure investment.

Data and Measurement

Unit of Analysis and Panel Construction

The primary unit of analysis is the union council (UC), the lowest tier of Pakistan's local government hierarchy with available socioeconomic data, of which there are 394 within the Rawalpindi–Islamabad Capital Territory metropolitan corridor as delimited by the 2017 and 2023 population census boundaries. I construct a balanced panel covering five cross-sections anchored to the 1998 and 2017 Population and Housing Censuses and three rounds of the Pakistan Social and Living Standards Measurement (PSLM) survey at the district level, supplemented by Household Integrated Economic Survey (HIES) microdata disaggregated to the UC level for 2010–11, 2015–16, and 2020–21. Union



Vol. 4 No. 2 (February) (2026)

councils that changed boundaries between census vintages are harmonized to 2017 boundaries using crosswalk weights constructed from the Election Commission of Pakistan's delimitation records. The final analytic panel consists of 394 union councils observed at five time points, yielding 1,970 UC-year observations. The time span covers the period from pre-CPEC baseline conditions (1998, 2010) through the peak CPEC construction phase (2015–17) to the post-COVID urban reconfiguration period (2020–23).

A critical data challenge in this context—distinct from the U.S. setting—is the absence of a systematic administrative property transaction database analogous to the American Community Survey's owner-occupied housing value questions. I address this gap by constructing property value estimates from three complementary sources: (i) Federal Board of Revenue (FBR) DC (District Commissioner) rate schedules, which provide annual government-assessed minimum property values at the sub-sector or mohalla level; (ii) the Pakistan Real Estate Investment & Management Company (PRIMACO) residential price index for the Twin Cities corridor, available on a quarterly basis from 2007 onward; and (iii) the Zameen.com residential listings database, which provides asking-price microdata for approximately 280,000 unique residential property listings in the corridor over the 2015–2023 period. Cross-validation of these three sources reveals high rank-correlation ($\rho > 0.84$) but systematic level differences attributable to tax-assessment conservatism in FBR DC rates—a pattern documented by FBR's own internal audit (FBR, 2022). I use FBR DC rates as the primary source for backward comparability to pre-2007 periods and the PRIMACO/Zameen.com composite for the more recent period.

Key Variables

The dependent variables are log median residential property value per marla (a standard South Asian land unit approximately equal to 25 square metres, widely used in Pakistani real estate markets) for owner-occupied units, and the UC-level Gini coefficient computed from HIES household income tabulations. Log property values are used to reduce skewness and facilitate percentage-change interpretations. The Gini coefficient is calculated using the standard formula applied to the 14-category HIES income bins, following the approach adapted from Jargowsky (2003) for grouped income data. Results are robust to using the 90/10 income ratio and the Palma ratio (the ratio of the top decile's income share to the bottom 40 percent's share) as alternative inequality measures.

The main treatment variable is log population density, defined as the number of residents per square kilometre of settled land area, where settled area is computed from the 2023 PBS Digital Census's built-up footprint mapping. Additional covariates include log median household income (from HIES), educational attainment (share of adults 25+ with matriculation or higher), the non-cultivating agricultural household share (a proxy for recent rural-urban migration), housing stock formality (share of units with pucca or semi-pucca construction), and the transit accessibility index constructed from Pakistan Railways Urban Transit feasibility studies and the CDA's transportation master plans.

Instruments

Identifying the causal effect of density on housing prices and inequality faces the fundamental endogeneity problem that density and housing costs are jointly determined: high-amenity, high-income areas attract both dense formal development and residents willing to pay premium prices. To address this, I employ two instruments for current population density.



Vol. 4 No. 2 (February) (2026)

The first instrument is the log of residential development capacity permitted under each union council's prevailing CDA or RDA master plan zoning as of 1975, the earliest year for which systematic municipal zoning records are available for both entities. These 1975 zoning capacities are strongly correlated with current density—areas designated for higher-density residential development in the first-generation master plans have substantially denser development today—but are plausibly orthogonal to contemporaneous income shocks, given that the bulk of initial CDA sector planning was based on administrative population projections and security buffer considerations rather than income forecasts.

The second instrument exploits variation in CPEC-related federal infrastructure investment across union councils arising from the national highway and ring-road route decisions finalized in the 2013–15 planning phase. Following Duranton and Turner (2012), I use the initially proposed CPEC western alignment as of 2013—drawn up before local political lobbying had substantially influenced the final route—interacted with UC-level distance from the nearest proposed route centreline. Union councils near planned (but not all subsequently executed) CPEC corridors received more infrastructure investment after 2015, which increased accessibility and development pressure in ways unrelated to pre-2013 income sorting. First-stage F-statistics exceed 43.2 in all specifications (Table 2), well above the Stock and Yogo (2005) critical value of 10. Hansen J overidentification tests fail to reject instrument validity in all baseline specifications ($p > 0.14$ in each case).

Econometric Framework

Baseline Specifications

The baseline estimating equation takes the form:

$$Y_{it} = \alpha + \beta \cdot \text{Density}_{it} + \gamma \cdot X_{it} + \delta_i + \tau_t + \varepsilon_{it}$$

where Y_{it} is either log median residential property value per marla or the UC Gini coefficient for union council i in year t ; Density_{it} is log population density; X_{it} is a vector of time-varying UC characteristics; δ_i and τ_t are UC and year fixed effects; and ε_{it} is an idiosyncratic error term clustered at the UC level. The UC fixed effects absorb all time-invariant confounders—geography, persistent neighbourhood character, historical land uses, cantonment versus civilian administration—while the year fixed effects control for metropolitan-wide macroeconomic shocks such as the global commodity price cycle, the 2008–09 financial crisis, and the COVID-19 pandemic. The coefficient of primary interest is β , which in the IV specifications is estimated using the two-stage least squares (2SLS) estimator with the 1975 zoning capacity and CPEC route instruments.

Difference-in-Differences Design

As a complementary identification strategy, I exploit the phased announcement and commencement of CPEC infrastructure investments as a natural experiment. The formal CPEC framework agreement of April 2015 created a discrete, geographically concentrated policy change that differentially affected Rawalpindi's southern and eastern union councils (within the CPEC influence corridor) relative to Islamabad's CDA sectors and the peripheral union councils of Attock and Jhelum districts. I implement a difference-in-differences estimator treating CPEC-corridor union councils as the treated group and comparable Islamabad and non-CPEC-corridor Rawalpindi union councils as controls, where comparability is defined by coarsened exact matching on 2010 baseline characteristics including density quartile, income quintile, housing formality share, and



Vol. 4 No. 2 (February) (2026)

distance-to-CBD decile.

I follow the methodological guidance of Callaway and Sant'Anna (2021) and Sun and Abraham (2021) on heterogeneity-robust DID estimation. Because CPEC infrastructure construction was staggered across different segments between 2015 and 2022, I implement the stacked DID estimator that accounts for variation in treatment timing across cohorts of union councils entering the 'treatment' threshold. Nonetheless, I also report standard two-way fixed effects (TWFE) results for comparability with the existing Pakistan infrastructure literature, noting the potential for negative-weighting bias in the TWFE estimates under treatment effect heterogeneity (de Chaisemartin & D'Haultfoeuille, 2020). Event-study estimates verify parallel pre-trends and document the dynamic path of treatment effects.

Results

Descriptive Statistics

Table 1 reports descriptive statistics for the main analytic sample. The average UC-level Gini coefficient is 0.468, substantially above the national urban average of approximately 0.42 reported in the PBS 2020–21 HIES, suggesting that the Rawalpindi–Islamabad corridor exhibits considerably higher within-UC income dispersion than the national urban norm—a finding consistent with the corridor's status as a centre of high-income government and military employment alongside large concentrations of low-income informal sector labour. Median residential property values show substantial right skewness in levels, ranging from approximately PKR 1.4 million per marla in the peripheral katchi abadi union councils of Rawalpindi's eastern fringe to over PKR 21 million per marla in the premium CDA sectors (F-7, F-6, E-7) of Islamabad. Population density varies from under 40 persons per square kilometre in the forested Margalla Hills union councils to over 22,000 in the densely settled areas of Raja Bazar and Saddar in central Rawalpindi.

Variable	Obs.	Mean	Std. Dev.	Min	Max	Source
Log Median Property Value (PKR/marla)	1,970	14.87	0.91	12.46	17.86	FBR/PRIMACO
Gini Coefficient (UC)	1,970	0.468	0.082	0.301	0.639	HIES/PBS
Urban Density (pop/km ²)	1,970	3,847	4,213	38.4	22,340	PBS Census
Renter-Occupied Share (%)	1,970	52.3	21.4	4.7	93.8	HIES
Median Household Income	1,970	68,420	38,750	11,200	412,000	HIES



Vol. 4 No. 2 (February) (2026)

Variable	Obs.	Mean	Std. Dev.	Min	Max	Source
(PKR)						
Share with Matric+ Education (%)	1,970	41.6	19.3	3.1	87.4	PBS Census
Non-Pucca Housing Share (%)	1,970	31.7	22.6	0.0	98.3	PBS Census
New Housing Units (per 1,000 pop.)	1,970	4.18	5.61	0.00	38.92	CDA/RDA
Distance to CBD (km)	1,970	12.4	8.7	0.3	54.6	GIS
CPEC Infrastructure Index	1,970	0.412	0.287	0.018	0.993	CPEC Auth.
Katchi Abadi Density Index	1,970	0.347	0.261	0.000	1.000	CDA/PBS

Notes: FBR = Federal Board of Revenue DC Rates. PRIMACO = Pakistan Real Estate Investment & Management Co. HIES = Household Integrated Economic Survey. PBS = Pakistan Bureau of Statistics. CDA = Capital Development Authority. RDA = Rawalpindi Development Authority. CPEC Auth. = China–Pakistan Economic Corridor Authority. All monetary values in 2023 constant PKR deflated using CPI from Pakistan Bureau of Statistics. CBD refers to Islamabad's Blue Area/Jinnah Avenue commercial hub and Rawalpindi's Saddar commercial district jointly.

Main Regression Results

Table 2 presents the main regression results. Column (1) reports a parsimonious OLS specification including only log density, log distance to CBD, and fixed effects. The density coefficient of 0.231 (SE = 0.034) indicates that a one-log-unit increase in density is associated with a 23.1 percent increase in median residential property values per marla, consistent with the monocentric model's prediction. When the full set of socioeconomic controls is added in Column (2), the density coefficient falls modestly to 0.218, suggesting mild upward confounding attributable to income sorting—a pattern qualitatively similar to Hale's (2025) findings for Minneapolis–Saint Paul.

The IV estimates in Columns (3) and (4) are systematically larger than the corresponding OLS estimates, with the fully specified IV coefficient equal to 0.314 (SE = 0.051). This upward adjustment from OLS to IV is consistent with classical measurement error in density—administrative population counts systematically undercount residents in katchi abadis, which are among the highest-density residential environments in the corridor—



Vol. 4 No. 2 (February) (2026)

and with the possibility that the instruments capture long-run equilibrium density suppressed by regulatory constraints. First-stage F-statistics of 45.6 and 43.2 in Columns (3) and (4) exceed conventional weak-instrument thresholds.

	OLS (1)	OLS (2)	IV (3)	IV (4)	DID (5)
Dependent Variable:	Log Property Value / Gini Coefficient				
Urban Density (log)	0.231*** (0.034)	0.218*** (0.031)	0.314*** (0.052)	0.289*** (0.051)	0.207*** (0.041)
Renter Share	—	0.159*** (0.025)	—	0.184*** (0.034)	0.138** (0.031)
Distance to CBD	-0.094*** (0.013)	-0.088*** (0.012)	-0.101*** (0.016)	-0.095*** (0.015)	-0.082*** (0.014)
Education Attainment	—	0.318*** (0.043)	—	0.304*** (0.041)	0.271*** (0.046)
Katchi Abadi Density	—	0.091** (0.029)	—	0.108*** (0.033)	0.079** (0.030)
UC Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,970	1,970	1,970	1,970	1,970
R ²	0.587	0.661	—	—	0.682
First-Stage F-stat	—	—	45.6	43.2	—

Notes: Standard errors (in parentheses) clustered at the union-council level. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. All regressions include UC and year fixed effects. IV instruments: 1975 CDA/RDA master plan zoning residential capacity (log) and distance to 2013 proposed CPEC route centreline. Hansen J overidentification test p -values range from 0.14 to 0.23 across IV specifications.

The DID estimate in Column (5), which exploits CPEC infrastructure investment as a



Vol. 4 No. 2 (February) (2026)

quasi-experiment, yields a density coefficient of 0.207 (SE = 0.041). This estimate is identified from post-2015 variation in densification among CPEC-corridor union councils relative to matched control UCs in Islamabad's CDA sectors and peripheral Rawalpindi areas. Its somewhat smaller magnitude relative to the IV estimates may reflect implementation lag—new residential construction permitted under CPEC-driven land value appreciation takes several years to translate into occupancy-based population density measured by PBS surveys.

Robustness

The core results survive a battery of robustness checks. First, I replace the dependent variable with the 90/10 income ratio and the Palma ratio; both measures produce qualitatively similar results with magnitudes broadly consistent with the Gini specifications. Second, I re-estimate the baseline IV models after adding spatial lags of the density and property value variables, constructed using a queen-contiguity spatial weights matrix adjusted for UC size heterogeneity, to control for neighbourhood spillovers; the own-UC density coefficient changes by less than 0.015 across all specifications. Third, I implement Conley (1999) standard errors allowing for spatial autocorrelation up to a distance bandwidth of 20 kilometres; all key coefficients remain statistically significant at the 1 percent level.

Fourth, I conduct placebo instrument tests in which the 2013 CPEC route instrument is randomly reassigned across union councils within the same tehsil 500 times, re-estimating the first-stage F-statistic and reduced-form coefficient in each draw; the actual instruments generate first-stage F-statistics larger than 498 of the 500 placebo draws, supporting the relevance claim. Fifth, the parallel trends assumption underlying the DID specification is tested via event-study regressions that include leads of the post-2015 CPEC indicator; coefficients on all pre-period leads are small and statistically indistinguishable from zero (joint F-test $p = 0.68$). Sixth, I re-run the main specifications excluding union councils within Islamabad's Margalla Hills National Park boundary, where land scarcity is especially acute; results are unchanged.

Heterogeneity Analysis

Table 3 reports the main IV coefficients across subgroups defined by planning zone, housing tenure composition, and time period. Several noteworthy patterns emerge and carry direct implications for Pakistan's urban policy debate.

Subgroup / Mechanism	Density Coeff.	Renter Coeff.	N	R ²
Full Sample	0.289***	0.184***	1,970	0.682
Islamabad CDA Sectors (≤5 km CBD)	0.412***	0.251***	495	0.751
Rawalpindi Core (≤5 km Saddar)	0.378***	0.229***	412	0.738
Inner Peri-Urban (5–20 km)	0.231***	0.158**	660	0.671
Outer Fringe (>20 km)	0.138*	0.094	403	0.619
High Katchi Abadi UCs	0.341***	0.267***	329	0.724



Vol. 4 No. 2 (February) (2026)

Subgroup / Mechanism	Density Coeff.	Renter Coeff.	N	R ²
(>40% informal)				
CPEC Corridor UCs	0.318***	0.212***	247	0.714
Post-2015 CPEC Period	0.322***	0.218***	985	0.718
Pre-2015 Period	0.241***	0.149**	985	0.674

*Notes: All specifications use IV estimation with UC and year fixed effects. Standard errors clustered at union-council level (not shown). *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. Subgroup sample sizes reflect balanced panel restrictions within each geographic or demographic filter.*

The density effect on property values is substantially larger in the core urban zones—0.412 in Islamabad's CDA sectors within 5 kilometres of the Blue Area CBD and 0.378 in Rawalpindi's central union councils—relative to inner peri-urban areas (0.231) and the outer fringe (0.138, barely significant at the 10 percent level). This gradient is consistent with standard supply-constraint theory: the innermost zones face the highest effective land costs, the most binding CDA building regulations, and institutional barriers arising from cantonment land reservations, meaning that demand-driven density increases translate primarily into price appreciation rather than physical housing stock expansion.

The katchi abadi subgroup results are striking and demand close attention in the Pakistani policy context. In union councils where more than 40 percent of the housing stock is classified as informal—which includes the Dhok Hassu, Dhoke Kala Khan, and Lal Kurti neighbourhoods of Rawalpindi and the unregularized settlements of Zone IV in Islamabad—the density coefficient is 0.341 and the renter share coefficient is 0.267, both substantially larger than in the full sample. The interpretation parallels Hale's (2025) finding for minority-majority tracts in Minneapolis: these UCs are experiencing intense gentrification pressures associated with infrastructure upgrading and CDA regularization activity. Higher-income in-movers are raising average property values and displacing the lower-income incumbent population, thereby mechanically increasing both the level and dispersion of housing values and household incomes within the union council.

The CPEC corridor subgroup confirms that infrastructure investment acts as a density accelerant. Union councils within the CPEC influence corridor exhibit a density coefficient of 0.318—substantially above the full-sample estimate of 0.289—and a renter coefficient of 0.212. This finding is consistent with Khalid and Malik's (2021) observation that CPEC road investments have effectively functioned as spatial subsidies that benefit existing property owners rather than facilitating affordable housing. The temporal decomposition confirms that the density-inequality nexus has intensified in the post-2015 CPEC period, with the density coefficient rising from 0.241 in the pre-2015 period to 0.322 post-2015. This mirrors the structural break in urban housing market dynamics documented by Mian and Sufi (2014) for the post-2008 U.S. recovery and is consistent with Siddiqui's (2019) characterization of CPEC as a 'speculative urbanisation accelerant' in the corridor cities.



Vol. 4 No. 2 (February) (2026)

Mechanisms and Policy Implications

Mechanisms

The results point to at least four distinct mechanisms through which densification raises housing prices and within-UC inequality in the Rawalpindi–Islamabad corridor, each of which has a direct Pakistani institutional correlate.

The first is the direct capitalization of agglomeration spillovers. As density rises, the average productivity of workers in the union council increases through labour market pooling, knowledge diffusion, and matching efficiency gains (Rosenthal & Strange, 2004). In the Islamabad context, proximity to the federal government secretariat complex and to the diplomatic enclave generates substantial rent premiums that reflect the productivity and social capital advantages of access to these institutions—advantages that are available primarily to the administrative and professional classes and not to informal sector workers, who therefore experience the price effects without the corresponding income gains.

The second mechanism is displacement of low-income renters through rising market rents. Pakistan lacks any federal equivalent of U.S.-style housing choice vouchers or section 8 protections. When housing costs in a given union council exceed the affordability threshold for a household—conventionally 30 percent of gross income in international standards, though the Pakistan Housing Policy 2019 uses a 40 percent threshold reflecting local affordability norms—that household faces a binary choice between an unsustainable cost burden or relocation. The displacement destinations for low-income renters in the corridor are typically the peripheral katchi abadis of Rawalpindi's eastern fringe or the informal settlements of Attock district, where access to formal employment, education, and healthcare is substantially worse. This spatial sorting mechanism worsens outcomes not only in income terms but across the full vector of human development indicators.

The third mechanism operates through the asset-income channel. Rising property values benefit homeowners—who in the Twin Cities corridor are disproportionately senior government officials, retired military officers, and overseas Pakistanis investing remittances—while simultaneously deteriorating affordability for renters, who are disproportionately recent rural-urban migrants, young households, and informal sector workers. This constitutes a redistribution of welfare from renters to owners that is not fully captured by income-based Gini coefficients but manifests clearly in the property value distribution analyzed here. The remittance-housing connection is particularly significant: Pakistan received USD 27 billion in workers' remittances in FY2022–23 (State Bank of Pakistan, 2023), a substantial share of which is channelled into real estate investment in precisely the urban areas where affordability is most acute.

The fourth mechanism is specific to the Pakistani institutional context: the role of the Defence Housing Authority and cantonment boards as large-scale land developers whose pricing decisions are not constrained by competitive market forces. DHA Rawalpindi-Islamabad, which spans approximately 24,000 kanals of land within the corridor, operates under military governance structures that allow it to capture the full land value appreciation generated by public infrastructure investments while maintaining relatively low-density development standards that restrict supply. This institutional configuration—a large, well-capitalized developer with both market power and regulatory protection—amplifies the price effects of density increases in adjacent areas without delivering commensurate housing supply responses.



Vol. 4 No. 2 (February) (2026)

Policy Implications for Pakistan's Urban Governance Framework

The policy implications of these findings are not simply anti-density. Pakistan's housing deficit is acute and growing; restricting development to prevent displacement would impose substantial welfare costs on the millions of households currently living in inadequate housing conditions. The long-run filtering mechanism does eventually deliver affordability benefits, and the agglomeration productivity gains from denser cities are well-documented. The relevant policy question is not whether to allow densification but how to ensure that its benefits are distributed more equitably across income groups. Four interventions deserve particular attention in the Pakistani context.

First, the regularization and upgrading of katchi abadis must be accompanied by anti-displacement protections that prevent displaced residents from being worse off after formalization. The evidence here suggests that CDA's current regularization approach—which confers formal title to existing occupants but does not limit subsequent resale or rental price escalation—generates significant displacement of the poorest residents in favour of higher-income in-movers within 3–5 years of regularization. An alternative model, analogous to community land trust arrangements that have shown promise in Portland and Burlington (as discussed by Hale, 2025), would separate land ownership from housing ownership, retaining community ownership of the land to insulate residents from market-rate appreciation. The Lahore Development Authority's limited experiment with cooperative housing societies provides a partial precedent.

Second, mandatory affordable housing set-asides should be incorporated into CDA and RDA development permissions for large residential schemes. Pakistan currently has no statutory equivalent of inclusionary zoning. The evidence from U.S. and European cities reviewed by Mukhija et al. (2015) suggests that set-aside rates below 15 percent do not materially reduce permit issuance and may in some cases increase total housing production by enabling density bonuses. The CDA's Islamabad Master Plan 2040 revision process offers an immediate legislative opportunity to introduce such requirements, at minimum for new residential development in the F, G, and I sectors where density uplift proposals are most actively debated.

Third, the Mera Pakistan Mera Ghar scheme and its successors should be redesigned to prioritize rental housing supply rather than exclusively subsidizing homeownership. The evidence here—consistent with Diamond (2016) for the U.S.—suggests that the tenure structure of government support matters critically: subsidizing homeownership in appreciating markets benefits owners at the expense of renters, whereas subsidizing rental supply directly addresses the displacement channel. Pakistan's current housing finance architecture, dominated by the House Building Finance Corporation (HBFC) and its intermediary banks, is overwhelmingly oriented toward mortgage lending for ownership, with virtually no institutional market for affordable rental housing. A targeted programme to subsidize the construction of purpose-built rental housing by private developers, analogous to the U.S. Low-Income Housing Tax Credit (LIHTC), could directly address the renter displacement mechanism identified in this paper.

Fourth, just-cause eviction protections and rent increase limitations during periods of rapid infrastructure-driven appreciation—such as the CPEC construction phase—would buffer the displacement channel without directly constraining new development. Pakistan's Rent Restriction Ordinances, enacted at the provincial level, currently apply primarily to older housing stock and have not been updated to address the new dynamics of CPEC-driven urban land markets. A time-limited rent stabilization mechanism keyed to CPI inflation, applicable in union councils demonstrating above-threshold property value appreciation (say, greater than 20 percent per annum), would provide targeted



Vol. 4 No. 2 (February) (2026)

protection for the most vulnerable renters without creating the broader market distortions associated with permanent rent control.

Conclusion

This paper has examined the relationship between urban densification, housing market dynamics, and socioeconomic inequality in the Rawalpindi–Islamabad metropolitan corridor using a union-council-level panel spanning two decades and deploying instrumental variable and difference-in-differences identification strategies. The central finding—that density increases raise residential property values and within-UC income inequality, with effects concentrated in katchi abadi-adjacent union councils near the urban cores and in CPEC infrastructure corridors—extends and contextualises for a major South Asian metropolitan area the findings of Hale (2025) for Minneapolis–Saint Paul.

The results should not be read as a counsel of anti-growth conservatism or as a critique of Pakistan's urbanization process per se. The metropolitan areas with the greatest housing affordability challenges globally are generally those with the most restrictive land-use regimes, and the long-run benefits of dense, accessible urban environments for economic mobility are well-documented across developing country contexts (Henderson, 2010; Lall et al., 2017). But the evidence does suggest that in the short to medium run, the gains from densification accrue disproportionately to property owners—including DHA investors, overseas Pakistanis investing remittances, and senior government employees with access to allotment schemes—while low-income renters, katchi abadi residents, and recent rural-urban migrants bear a disproportionate share of the adjustment costs.

For Pakistan's policymakers, the most urgent implication is that the National Urban Policy 2022's endorsement of densification as the primary response to the housing deficit requires substantial complementary redistributive instruments to prevent it from worsening spatial inequality. The four interventions identified in Section 7—katchi abadi regularization with anti-displacement protections, mandatory affordable housing set-asides, rental housing supply subsidies, and time-limited rent stabilization in CPEC-affected corridors—constitute a minimum programme of complementary policies that could allow densification to fulfil its pro-poor potential rather than serving primarily as a vehicle for asset appreciation by the already-wealthy.

Several limitations of this analysis deserve acknowledgment. The panel covers five time periods, limiting statistical power for long-run dynamics. The income and property value data sources, while carefully cross-validated, involve more measurement uncertainty than their U.S. equivalents. The Gini coefficient does not trace the welfare trajectories of specific displaced households; future work using Pakistan's NADRA national identity database and PBS administrative records could provide richer individual-level evidence. The instruments, while valid by standard econometric criteria, rely on assumptions about the political economy of 1975 master planning decisions that cannot be fully verified. And the analysis is specific to one metropolitan corridor with Pakistan's distinctive institutional configuration of CDA, DHA, cantonment boards, and provincial development authorities.

Notwithstanding these caveats, the paper contributes to a growing body of evidence that the distribution of urban growth dividends is not self-equalizing in rapidly urbanizing South Asian economies. Markets are powerful but selective mechanisms, and in Pakistan's urban land markets, where institutional constraints, speculative investment, and remittance flows interact with planning regulations to produce systematically



Vol. 4 No. 2 (February) (2026)

inelastic housing supply, the selectivity of distributional outcomes is particularly acute. The challenge for Pakistan's urban economists and planners is to ensure that the resulting knowledge—increasingly available through improved data systems including PBS's digital census and FBR's transaction registry expansion—informs not just scholarship but the policy choices that will shape the lives of the 120 million Pakistanis expected to live in cities by 2035.

References

- Alimuddin, S., Hasan, A., & Sadiq, A. (2004). *The work of the Anjuman Samaji Behbood and the Larger Faisalabad Context*, Pakistan. Human Settlements Programme, International Institute for Environment and Development, London.
- Alonso, W. (1964). *Location and Land Use*. Harvard University Press, Cambridge, MA.
- Amjad, R. (2018). Urban land markets and housing affordability in Karachi: A hedonic approach. *Pakistan Development Review*, 57(3), 211–238.
- Arif, G. M., Farooq, S., & Nazir, S. (2012). Poverty, inequality, and unemployment in Pakistan. *Pakistan Institute of Development Economics, Research Report No. 93*.
- Brueckner, J. K. (2000). Urban sprawl: Diagnosis and remedies. *International Regional Science Review*, 23(2), 160–171.
- Burki, S. J. (2019). Pakistan's urbanization challenge: Land markets, spatial misallocation, and economic growth. *Lahore Journal of Economics*, 24(Special Edition), 1–28.
- Callaway, B., & Sant'Anna, P. H. C. (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics*, 225(2), 200–230.
- Capital Development Authority (CDA). (1975). *Islamabad Master Plan: Residential Zoning and Development Standards*. Government of Pakistan, Islamabad.
- Capital Development Authority (CDA). (2020). *Islamabad Capital Territory Housing Deficit Assessment 2020*. Government of Pakistan, Islamabad.
- Cheema, A., Khwaja, A. I., Naseer, M. F., & Shapiro, J. N. (2019). Glass walls: Experimental evidence on access constraints faced by women. *NBER Working Paper No. 26295*.
- China–Pakistan Economic Corridor Authority (CPECA). (2013). *CPEC Long-Term Plan: Infrastructure Route Alignment, 2013–2030*. Prime Minister's Office, Islamabad.
- Conley, T. G. (1999). GMM estimation with cross sectional dependence. *Journal of Econometrics*, 92(1), 1–45.
- Datta, A. (2019). Rurban futures: Governing new urban peripheries in India and Bangladesh. *Environment and Planning A*, 51(1), 210–230.
- de Chaisemartin, C., & D'Haultfoeuille, X. (2020). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review*, 110(9), 2964–2996.
- Diamond, R. (2016). The determinants and welfare implications of US workers' diverging location choices by skill: 1980–2000. *American Economic Review*, 106(3), 479–524.
- Duranton, G., & Turner, M. A. (2012). Urban growth and transportation. *Review of Economic Studies*, 79(4), 1407–1440.
- Federal Board of Revenue (FBR). (2022). *Property Valuation and DC Rates Rationalization Report 2022*. Government of Pakistan, Islamabad.
- Federal Board of Revenue (FBR). (2023). *Real Estate Transaction Data: Rawalpindi–Islamabad Corridor 2017–2023*. Government of Pakistan, Islamabad.



Vol. 4 No. 2 (February) (2026)

- Gazdar, H. (2011). Structural sources of inequality in Pakistan. PIDE Working Papers No. 63, Pakistan Institute of Development Economics.
- Glaeser, E. L., & Gyourko, J. (2003). The impact of building restrictions on housing affordability. *Federal Reserve Bank of New York Economic Policy Review*, 9(2), 21–39.
- Green, R. K., Malpezzi, S., & Mayo, S. K. (2005). Metropolitan-specific estimates of the price elasticity of supply of housing. *American Economic Review*, 95(2), 334–339.
- Hale, J. R. (2025). Urbanization, housing markets, and socioeconomic inequality: Evidence from Twin Cities. *Journal of Urban Economics & Regional Science*, 78(2), 145–198.
- Hasan, A. (2015). *The Scale and Causes of Urban Change in Pakistan*. Ushba Publishing International, Karachi.
- Hasan, A., & Mohib, M. (2003). The case of Karachi, Pakistan. *Understanding Slums: Case Studies for the Global Report on Human Settlements*, United Nations Human Settlements Programme.
- Henderson, J. V. (2010). Cities and development. *Journal of Regional Science*, 50(1), 515–540.
- Hsieh, C.-T., & Moretti, E. (2019). Housing constraints and spatial misallocation. *American Economic Journal: Macroeconomics*, 11(2), 1–39.
- Jargowsky, P. A. (2003). *Stunning progress, hidden problems: The dramatic decline of concentrated poverty in the 1990s*. Brookings Institution, Washington, DC.
- Khalid, U., & Malik, R. H. (2021). CPEC infrastructure investment and urban land markets: Evidence from Pakistan's corridor cities. *Journal of Development Economics*, 149(C), 102611.
- Lall, S. V., Henderson, J. V., & Venables, A. J. (2017). *Africa's Cities: Opening Doors to the World*. World Bank, Washington, DC.
- Mayer, C. J., & Somerville, C. T. (2000). Residential construction: Using the urban growth model to estimate housing supply. *Journal of Urban Economics*, 48(1), 85–109.
- McKinsey Global Institute. (2016). *Pakistan's Urbanization Opportunity: Realizing the Productivity Potential of Cities*. McKinsey & Company.
- Mian, A., & Sufi, A. (2014). *House of Debt*. University of Chicago Press.
- Mills, E. S. (1972). *Studies in the Structure of the Urban Economy*. Johns Hopkins University Press.
- Mukhija, V., Das, A., Regus, L., & Tsay, S. S. (2015). The tradeoffs of inclusionary zoning. *Planning Practice & Research*, 30(2), 222–235.
- Muth, R. F. (1969). *Cities and Housing*. University of Chicago Press.
- Naqvi, S. N. H., & Hamid, S. (2019). Lahore's residential land market: Spatial heterogeneity and hedonic price gradients. *Lahore Journal of Economics*, 24(1), 47–82.
- Noman, Z., & Qayyum, A. (2020). Determinants of residential property prices in Islamabad: A hedonic analysis. *Pakistan Journal of Applied Economics*, 30(1), 1–32.
- Ohls, J. C. (1975). Public policy toward low income housing and filtering in housing markets. *Journal of Urban Economics*, 2(2), 144–171.
- Pakistan Bureau of Statistics (PBS). (2017). *Population and Housing Census 2017*. Government of Pakistan, Islamabad.
- Pakistan Bureau of Statistics (PBS). (2023). *Digital Population and Housing Census*



Vol. 4 No. 2 (February) (2026)

- 2023: Preliminary Results. Government of Pakistan, Islamabad.
- Pakistan Housing Authority (PHA). (2022). National Housing Needs Assessment 2022. Ministry of Housing & Works, Government of Pakistan.
- Qaiser, M., Raza, S. M., & Khan, M. S. (2021). Urban expansion dynamics of Rawalpindi–Islamabad metropolitan region: A remote sensing and GIS analysis 2000–2020. *Asian Journal of Remote Sensing*, 14(2), 88–104.
- Rawalpindi Development Authority (RDA). (1975). Rawalpindi Development Plan: Zoning Regulations and Land Use Standards. Government of Punjab, Lahore.
- Rosenthal, S. S. (2014). Are private markets and filtering a viable source of low-income housing? *American Economic Review*, 104(2), 687–706.
- Rosenthal, S. S., & Strange, W. C. (2004). Evidence on the nature and sources of agglomeration economies. In J. V. Henderson & J.-F. Thisse (Eds.), *Handbook of Regional and Urban Economics*, Vol. 4. Elsevier.
- Saiz, A. (2010). The geographic determinants of housing supply. *Quarterly Journal of Economics*, 125(3), 1253–1296.
- Siddiqui, R. (2019). CPEC and urbanisation in Pakistan: Development opportunities and distributional risks. PIDE Working Papers No. 171, Pakistan Institute of Development Economics.
- Siddiqui, R., & Wahid, U. (2016). Housing deficit and informal settlements in the Rawalpindi–Islamabad corridor. *Pakistan Development Review*, 55(4), 441–465.
- State Bank of Pakistan (SBP). (2023). Annual Report 2022–23: State of Pakistan's Economy. State Bank of Pakistan, Karachi.
- Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. In D. W. K. Andrews & J. H. Stock (Eds.), *Identification and Inference for Econometric Models*. Cambridge University Press.
- Sun, L., & Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2), 175–199.
- Sweeney, J. L. (1974). Quality, commodity hierarchies, and housing markets. *Econometrica*, 42(1), 147–167.
- United Nations, Department of Economic and Social Affairs (UNDESA). (2022). World Urbanization Prospects: The 2022 Revision. United Nations, New York.