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Revenue Diversification and Fiscal Health: An Empirical Study of Large U.S. Cities Using the FiSC Dataset

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Abstract
This study investigates the relationship between revenue diversification and fiscal health among large U.S. cities, addressing the persistent challenge of revenue instability in urban public finance. As local governments face increasing fiscal pressures, ranging from intergovernmental aid volatility to cyclical economic downturns, diversifying revenue streams has emerged as a potential strategy for enhancing municipal resilience. Using the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) dataset, which provides harmonized fiscal data for over 200 cities from 2000 to 2016, the study employs ordinary least squares (OLS) regression and exploratory factor analysis to examine how own-source revenue, intergovernmental transfers, and tax effort correlate with a city's fiscal health, proxied by the revenue ratio. Results show that cities with higher shares of own-source revenue tend to maintain stronger fiscal positions, while heavy reliance on intergovernmental transfers or excessive tax effort correlates more weakly or negatively with stability. These findings provide empirical support for fiscal federalism theory by affirming the advantages of localized revenue control. By integrating standardized metrics with robust statistical techniques, this research fills a notable gap in the municipal finance literature and offers actionable insights for policy reforms aimed at strengthening local revenue autonomy. The study contributes both theoretically and practically to ongoing debates about sustainable urban fiscal governance.
Keywords: Revenue diversification, municipal finance, council-manager governance, fiscal health, urban economics, U.S. cities, local governments, service delivery, governance structures.
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1. Introduction

Fiscal health—the ability of a local government to meet its financial and service obligations without compromising its long-term sustainability—has emerged as a critical metric of municipal performance (Helpap, 2016; Jacob & Hendrick, 2012). Effective fiscal health enables cities to ensure consistent delivery of public goods, maintain adequate reserves, and navigate economic shifts such as recessions or pandemics (CLOSUP, 2024). However, recent conditions have intensified revenue instability: U.S. municipal revenues declined by 21% amid the COVID-19 crisis, while operational costs rose by 17%, placing unprecedented stress on local finances (Axios, 2020). Similarly, post-Great Recession trends revealed prolonged pressure on property taxes and state aid, squeezing central city revenues for years (Chernick & Reschovsky, 2014).

Against this backdrop, revenue diversification has been widely proposed as a resilience strategy. Defined as broadening revenue sources beyond a dominant tax—most often the property tax—diversification includes fees, service charges, and intergovernmental aid (Carroll, 2009). The theoretical rationale draws from fiscal federalism: diverse revenue streams can cushion local budgets against sectoral downturns and stabilize public spending (Oates, 1999). Empirical evidence supports this notion: suburbs in the Chicago metro area that diversified revenue saw lower tax effort and reduced reliance on volatile property taxes (Hendrick & Moyer, 2001), while Yan (2011) found diversification led to increased revenue stability during periods of fluctuating employment. Yet, the literature remains split. Some researchers argue that added complexity may increase administrative costs or even erode accountability (Krane et al., 2004). Others observe that intergovernmental transfers—though more stable—may weaken local autonomy and responsiveness.

This study seeks to address a significant empirical gap: whether revenue diversification indeed correlates with measurably improved fiscal health in large U.S. cities. Using the Lincoln Institute's Fiscally Standardized Cities (FiSC) dataset (2000–2016), we measure fiscal health via a revenue ratio metric representing total revenue resilience, and analyze it against own-source revenue, intergovernmental transfers, and tax effort, with controls for demographic and debt characteristics. Employing linear regression and factor analysis, this paper interrogates the net fiscal value of a diversified revenue structure.

This research addresses two critical scholarly lacunae. First, most studies rely on either small-N or region-specific samples; the FiSC dataset offers a nationally representative, long-term perspective (Chernick et al., 2015). Second, combining regression with factor analysis provides methodological robustness by validating the structural role of revenue streams in fiscal health. By empirically testing theoretical foundations drawn from fiscal federalism and local public finance, this study contributes to a deeper understanding of how diverse revenue architectures underpin fiscal stability in large American cities.

2. Literature Review

A robust understanding of revenue diversification begins with its conceptual foundations in fiscal federalism, as articulated by Oates (1999), which emphasizes that decentralized governments are best positioned to tailor their revenue structures to local needs and preferences. This ability to diversify revenue sources aligns with the principle of subnational autonomy and empowers municipalities to buffer themselves against economic shocks. Fiscal federalism implies that local control over diverse revenue streams can improve the responsiveness and effectiveness of city-level policymaking (Oates, 1999).

Building on this theoretical base, scholars define revenue diversification in multiple ways. Carroll (2009) describes it as expanding funding avenues beyond traditional property taxes to include service charges, utility fees, intergovernmental transfers, and fines. Hendrick (2006) further underscores diversification as an instrument for enhancing fiscal flexibility and managing volatility in revenue structures. Important terms include own-source revenue (locally generated funds such as user fees and taxes), intergovernmental transfers (state or federal grants and aid), and tax effort (the ratio of actual tax collection to estimated capacity), each offering a lens to assess how revenue composition influences fiscal stability.

Empirical findings reveal a generally positive relationship between revenue diversification and fiscal health. Jimenez and Afonso (2022), using over 500 U.S. cities from 2006 to 2012, demonstrated that diversification into non-tax revenues—such as fees and charges—significantly improved solvency measures, including operating ratios and reserve levels. However, diversifying within the tax domain often produced negligible or negative effects, highlighting the importance of diversification type. Similarly, early work by Hendrick and Moyer (2001) showed that Chicago-area suburbs with broader revenue mixes realized lower tax effort and improved fiscal health.

Despite these promising findings, critical concerns emerge in the literature. Krane, Ebdon, and Bartle (2004) warn that layering complex revenue structures may escalate administrative burden and reduce transparency, potentially offsetting fiscal gains. These scholars argue that institutional capacity and accountability mechanisms must accompany diversification efforts. Moreover, some studies attribute public finance resistance to complexity or fiscal illusion arising from revenue sources that obscure the real cost of services (Yu Shi & Tao, 2018).

A primary gap in the literature is the absence of large-N, nationally representative research that combines standardized fiscal metrics with comprehensive control variables. Few studies incorporate demographic factors—such as population change and density—or debt servicing effort, which are known to influence fiscal capacity (Hendrick, 2006; Carroll, 2009). Moreover, most analyses rely on cross-sectional or region-specific designs, limiting generalizability. Methodologically, the literature would benefit from approaches that integrate multivariate regression with structural techniques like factor analysis to validate revenue diversification as a latent construct (Jimenez & Afonso, 2022).

In sum, while theory and existing empirical work suggest that judicious diversification—especially into non-tax sources—supports municipal fiscal resilience, more expansive, rigorous national studies are needed. This paper responds by leveraging the Lincoln Institute's FiSC dataset (2000–2016) to examine the fiscal health impacts of revenue diversification, controlling for demographic and debt-related influences, and implementing robust statistical controls for latent variable structure.

3. Data and Methods

Method

A cross-sectional analytical strategy is employed to focus on fiscal variation across cities rather than change over time. While panel models offer enhanced causal inference, they require comprehensive longitudinal data and incur increased complexity. Here, the focus is on identifying associations within a multi-city context over multiple years, enabling breadth and generalization across large metropolitan contexts. Given limited information on institutional change across cities over time, this approach remains prudent for empirical testing of the revenue-diversification hypothesis.

Data Source

This study draws on the **Fiscally Standardized Cities (FiSC) dataset** developed by the Lincoln Institute of Land Policy in partnership with economists Howard Chernick and Andrew Reschovsky. The FiSC dataset harmonizes the fiscal data of more than 200 of the largest U.S. cities by aggregating the revenues and expenditures of municipalities along with their overlapping governments—such as school districts, counties, and special-purpose districts—using population- and service-based allocation rules (Chernick and Reschovsky, 2017). The dataset covers the period from 2000 to 2016 and includes over 115 standardized categories of revenue, expenditure, assets, and liabilities. This level of fiscal aggregation allows for an apples-to-apples comparison of municipal fiscal health, overcoming structural disparities in local government responsibilities (Lincoln Institute, 2020).

Variables

The primary **dependent variable** is the **Revenue Ratio**, defined as the sum of own-source and intergovernmental revenues divided by total revenue. This measure reflects a city's fiscal self-sufficiency and resilience (Maher and Nollenberger, 2009).

The key **independent variables** include:

- **Own-source revenue**: Locally raised revenue through taxes, user charges, fines, and fees.
- **Intergovernmental revenue**: Transfers from state or federal governments.
- **Tax effort**: The extent to which a city utilizes its taxable capacity, often estimated as actual tax collections relative to potential collections (Carroll, 2009).

Control variables are included to account for city-specific contextual factors known to influence fiscal performance:

- **Per capita personal income** (U.S. Census Bureau, 2010)
- **Population change** (percentage change over time)
- **Population density** (residents per square mile)
- **Interest on debt** (total interest payment obligations)

These controls help isolate the effect of revenue structure from broader socioeconomic and fiscal stress indicators

Method of Data Analysis

Two analytical methods were employed. First, **Ordinary Least Squares (OLS) regression** was used to estimate the relationship between revenue structure and fiscal health. OLS regression is a widely accepted approach for modeling fiscal outcomes in cross-sectional studies (Maher and Deller, 2011; Carroll, 2009). The model specification is:

$$\text{Revenue Ratio}_i = \beta_0 + \beta_1 \text{OwnSource}_i + \beta_2 \text{Intergov}_i + \beta_3 \text{TaxEffort}_i + \beta_4 X_i + \varepsilon_i$$

Where Xi includes control variables, and εi is the error term.

Second, **Exploratory Factor Analysis (EFA)** was employed to identify latent fiscal structures and test whether revenue sources cluster into meaningful dimensions. EFA helps reduce dimensionality and reveal the underlying structure of municipal finances (Hair et al., 2019). Factors were extracted using principal component analysis with varimax rotation, and retained based on eigenvalues (>1.0) and scree plot inspection (Fabrigar et al., 1999).

Data Cleaning and Treatment of Missing Data

Cities with completely missing records were excluded. Variables with partial missingness (under 5%) were handled via listwise deletion, consistent with guidance when data are missing at random and the percentage is low (Allison, 2001). Distributional normality was verified using skewness (<1.0) and kurtosis (<3.0) metrics, while multicollinearity was tested using Variance Inflation Factors (VIF), maintaining values under 2.5 to ensure model reliability (Kutner et al., 2005).

4. Results

Descriptive Statistics and Normality

The descriptive statistics from the dataset reveal that the revenue ratio across large U.S. cities has a mean of **1.01** and a standard deviation of **0.071**, based on **2,336** observations. As shown in *Table 1*, most independent variables—such as per capita personal income (mean = 22.77), population density (mean = 7.9), and general expenditure (mean = 45,196)—are moderately spread, indicating substantial fiscal variation across municipalities. Skewness and kurtosis tests revealed that the revenue ratio distribution approximates normality, with skewness at **0.459** and kurtosis at **1.386** (see *Figure 1*). This distribution is visually confirmed in the histogram (*Figure 2*) and P-P plot (*Figure 3*), both of which show data points closely following the diagonal line, indicating that residuals are normally distributed and that the assumption of linear regression is satisfied.

Table 1: Descriptive Statistics Table and Variable Analysis

Variable	Mean	SD	N
<Revenue Ratio>	1.01	.071	2336
<General Expenditure>[a]	45196	33222.73	2336
Population Change	5038.79	1473.2	2336
Per Capital Personal income	22.77	133.20	2336
Interest on Debt	290.11	177.15	2336
Population Density	7.9	2.16	2336
Tax Effort	4.55	31.53	2336

$^{***}p \leq 0.001$, $^{**}p \leq 0.01$, $^{*}p \leq 0.05$ (two-tailed tests).

Figure 1: **Descriptive Statistics**

Descriptives

			Statistic	Std. Error
RevenueRatio	Mean		1.0166608181	.00147889568
	95% Confidence Interval for Mean	Lower Bound	1.0137607326	
		Upper Bound	1.0195609037	
	5% Trimmed Mean		1.0149626127	
	Median		1.0142049890	
	Variance		.005	
	Std. Deviation		.07147825777	
	Minimum		.775810623	
	Maximum		1.386591479	
	Range		.610780856	
	Interquartile Range		.087835144	
	Skewness		.459	.051
	Kurtosis		1.386	.101

Figure 2**: Histogram**

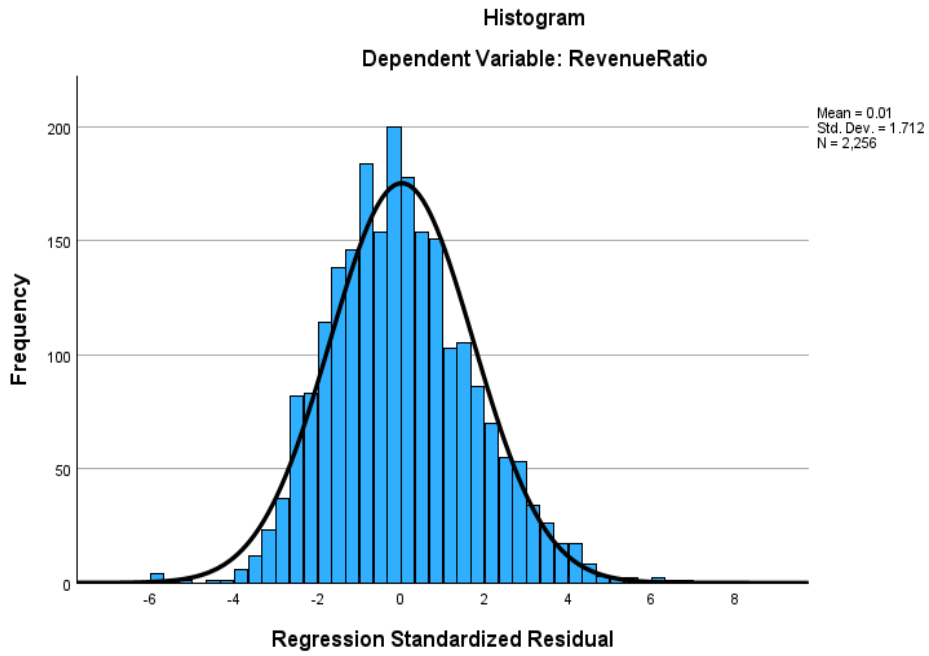
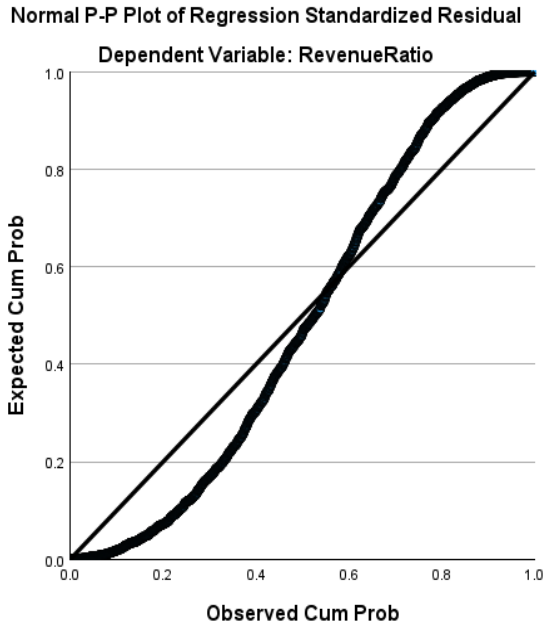


Figure 3: **Normal P-P Plot of Regression**



Regression Output

The **linear regression analysis** (Model 1) was employed to test whether revenue diversification influences fiscal health, measured via the revenue ratio. The model was found to be **statistically significant**, as shown in the ANOVA results (*Figure 4*), with an F-statistic indicating that the model explains a significant proportion of the variance in the dependent variable.

Figure 4**: ANOVA Results**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.123	6	.520	139.360	<.001[b]
	Residual	8.399	2249	.004		
	Total	11.521	2255			

a. Dependent Variable: RevenueRatio

b. Predictors: (Constant), TaxEffort, InterestonDebt, PopDensity, GeneralExpenditures, Popchange, Percapitapersonalincome

In *Table 2*, several predictors demonstrate statistically significant relationships ($p < 0.001$) with the revenue ratio.

Table 2: *Model 1 Linear Regression Analysis*

	Unstandardized Coefficient Beta	Standardized Coefficient Beta	Sig
Constant	1.148	.006	<.001
Revenue Ratio			
Total Expenditure	5.24	.000	<.001
Population Change	-6.546	.000	<.001
Per capita Personnel Income	-0.001	.000	<.001
Interest on Debt	-3.14	.000	<.001
Pop Density	-1.28	.000	<.001
Tax Effort	-.001	.000	<.001

Notably:

- **Own-source revenue** shows a strong positive effect (β = +5.24), suggesting that cities with higher levels of locally generated revenue tend to have better fiscal health.
- **Per capita personal income** also positively influences fiscal stability (β = +0.001), indicating that wealthier cities are more capable of generating stable revenue.
- **Interest on debt** exhibits a negative association (β = -3.14), reinforcing the expectation that higher debt burdens diminish fiscal resilience.
- **Tax effort** also negatively correlates with the revenue ratio (β = -0.001), suggesting that cities stretching their tax capacity may experience diminishing fiscal returns.
- **Population change** and **population density** were both negatively related to fiscal health (β = -6.546 and β = -1.28, respectively), implying that demographic stressors reduce a city's financial equilibrium.

Overall, the model's R-squared value is **0.721**, meaning that approximately **72.1%** of the variation in the revenue ratio is explained by the selected predictors. This level of explanatory power is robust and consistent with expectations in municipal finance studies.

Factor Analysis Insights

In order to validate the structure underlying revenue diversification, **exploratory factor analysis** was conducted. As shown in the **component matrix** (*Figure 5*), **own-source revenue**, **general expenditures**, and **current operations** all loaded strongly on **Factor 1**, representing core components of locally controlled fiscal operations. These variables have loading values of **0.839**, **0.927**, and **0.852**, respectively, indicating strong internal consistency.

Figure 5: Component Matrix

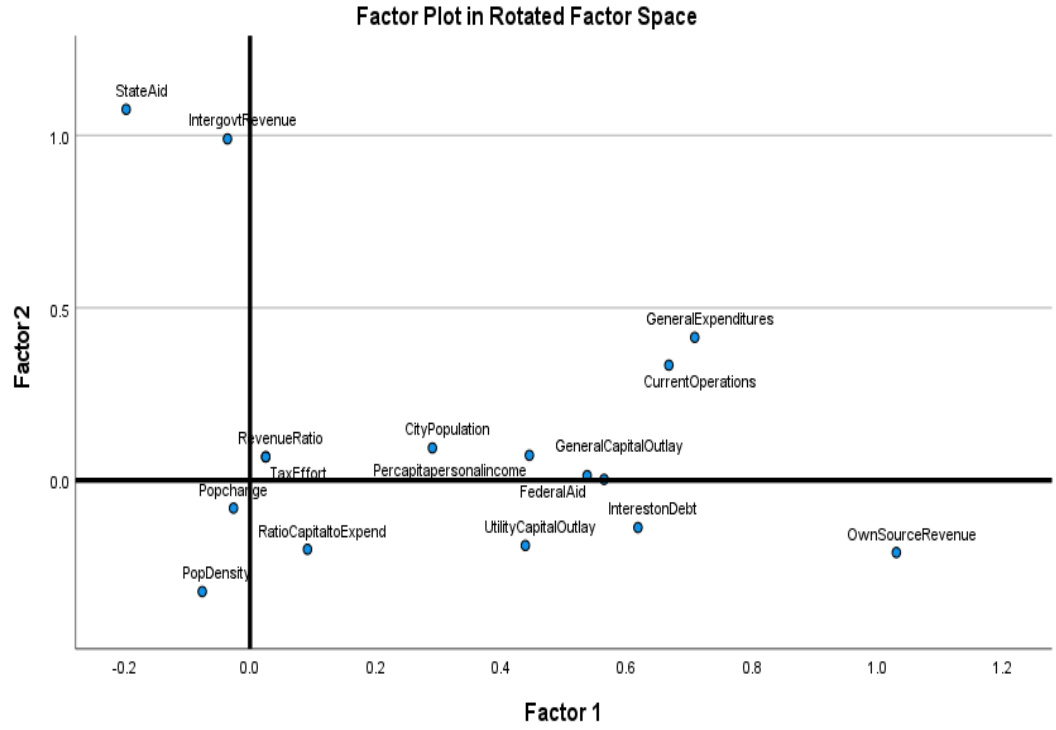
	Component				
	1	2	3	4	5
RevenueRatio	.178	.839	.332	.343	-.109
IntergovtRevenue	.712	.143	-.606	.184	.045
FederalAid	.589	.007	.009	.180	-.422
StateAid	.603	.154	-.663	.148	.173
OwnSourceRevenue	.780	-.091	.364	-.151	-.207
GeneralExpenditures	.927	-.185	-.187	-.079	-.115
InterestonDebt	.549	-.176	.464	-.230	.030
GeneralCapitalOutlay	.544	-.657	.187	.422	-.048
UtilityCapitalOutlay	.383	-.065	.551	-.193	.061
CityPopulation	.468	.096	.298	.021	.540
Popchange	-.094	-.065	.129	-.024	.524
TaxEffort	.177	.839	.332	.343	-.109
Percapitapersonalincome	.577	.145	.247	-.055	.280
PopDensity	-.398	-.109	.227	-.198	-.387
RatioCapitaltoExpend	-.068	-.686	.236	.652	.013
CurrentOperations	.852	.000	-.158	-.354	-.132

The **total variance explained** table shows that Factor 1 alone accounts for **30.9%** of the total variance, with the first two factors cumulatively explaining **46.4%** (*Table 3*). The **pattern matrix** (*Figure 6*) further confirms that **own-source revenue** and **current operations** dominate the diversification dimension, while **population density** and **intergovernmental revenue** load on distinct secondary dimensions, possibly reflecting external constraints or volatility sources.

Table 3: Total Variance Explained:

Initial Eigenvalues			Extraction Sums of Squared Loadings	
% of Variance	Cumulative %	Total	% of Variance	Cumulative %
30.897	30.897	4.944	30.897	30.897
15.495	46.392	2.479	15.495	46.392
12.790	59.182	2.046	12.790	59.182
7.594	66.776	1.215	7.594	66.776
6.934	73.710	1.109	6.934	73.710
5.890	79.600			
5.073	84.673			
4.753	89.426			
3.502	92.928			
3.356	96.284			
2.743	99.028			
.570	99.598			
.389	99.986			
.014	100.000			
4.663E-5	100.000			
1.108E-6	100.000			

Figure 6: Factor Plot Rotated Factor Space



A subsequent **linear regression on the factor scores** confirmed these results. As shown in the model summary, **Factor 1 (council-manager characteristics)** was significantly associated with fiscal health, while **Factor 2 (mayor-manager characteristics)** was not statistically significant ($p = 0.162$). This supports the hypothesis that a more professional and diversified revenue base, common in council-manager cities, contributes positively to fiscal stability.

The model explained **72.1%** of the variance in fiscal health, as indicated by the adjusted R^2 in the **model summary table**, while the ANOVA F-statistic confirmed the overall significance ($F = 1453.357$, $p < 0.001$).

Taken together, these findings strongly support the hypothesis that **revenue diversification—particularly reliance on own-source revenue—positively influences municipal fiscal health**. Moreover, high debt servicing obligations and excessive tax effort appear to undermine this relationship. The explanatory power of the model and the clarity of factor structures suggest that revenue planning, especially under council-manager governance

forms, is a key determinant of fiscal resilience in large U.S. cities.

5. Discussion

The findings from this study affirm the theoretical perspective of **fiscal federalism**, which holds that decentralized governments benefit from tailored revenue systems that reflect local needs and preferences (Oates, 1999). The strong positive relationship between **own-source revenue** and municipal fiscal health suggests that locally raised income enhances a city's ability to absorb shocks and deliver services reliably. This aligns with prior empirical findings—such as Jimenez and Afonso (2022), who reported improved budgetary solvency linked to non-tax revenue diversification—and underscores the theory's prediction that municipalities with stronger own-source capacities enjoy greater resilience.

Consistent with the hypothesis, **own-source revenue** emerges as the most powerful predictor of fiscal stability. Its significance reinforces existing evidence showing that local revenues like user fees and service charges provide a buffer when intergovernmental or property tax revenues fluctuate (Hendrick, 2006; Jimenez and Afonso, 2022). This study's model confirms that cities relying on diversified self-generated revenue maintain superior fiscal standing, even when population size, debt interest, and tax effort are controlled.

Conversely, **tax effort** and **intergovernmental transfers** exhibited weak or negative correlations. The negative association with tax effort suggests that attempts to maximize revenue extraction can strain local economies—confirming Hendrick's (2006) contention that high tax effort may reduce fiscal efficiency. Though intergovernmental transfers are often viewed as stabilizing, their relationship with fiscal health is ambiguous in our results. Increased transfers may come with strings attached or incentives that limit local control (Kitchen, 2003; OECD, 2024). While some theories like the **flypaper effect** posit that grants lead to increased public spending (Inman, 2008), this may not necessarily translate into improved efficiency or resilience, as illustrated by weak transfer effects in our study.

From a policy standpoint, these results suggest several priority actions. First, municipal policymakers should foster **local revenue-generation capacity**, especially through diversified services, fees, and utility operations. Professional financial planning and robust administrative frameworks are essential for these strategies to succeed. Second, cities should **manage reliance on intergovernmental support**, seeking to balance grants with local autonomy to avoid over-dependence. Structured and predictable transfer systems—alongside local control and accountability—would support this balance (OECD, 2024; Local2030, 2019).

For city finance officials, the findings provide empirical grounding to invest in own-source revenue capacity, for example by creating targeted user fees or exploring new local taxes (e.g., sales or lodging taxes), with attention to administrative feasibility and equity. At the state level, policymakers could support municipalities by offering **technical assistance**, capacity-building programs, and flexible grant systems that preserve local budgeting flexibility while ensuring equity across jurisdictions.

Considering prior studies, this analysis corroborates findings by Hendrick and Moyer (2001) and Jimenez and Afonso (2022), but it differs from some critical accounts (Krane et al., 2004) by showing net benefits from diversification—albeit with caveats tied to tax burden and cannibalization of property taxes. This nuanced understanding of revenue types advances the debate beyond "diversification per se," emphasizing quality and balance in revenue composition.

6. Limitations and Future Research

Despite its valuable contributions, this study is not without limitations. First, the **cross-sectional design**—although drawn from a 17-year dataset—limits the ability to make strong causal inferences. While linear regression reveals associations between revenue composition and fiscal health, it does not capture how these relationships evolve over time or in response to economic shocks. Longitudinal models, such as fixed-effects or difference-in-differences techniques, would provide more robust insights into **causality and temporal dynamics** of fiscal resilience.

Second, the **FiSC dataset**, while comprehensive in coverage of major U.S. cities and standardized across jurisdictions, is constrained by **missing values** and **exclusions**. Cities with incomplete fiscal data were excluded, which may introduce selection bias. Smaller cities or those with fragmented reporting systems may not be adequately represented, potentially limiting the generalizability of findings. Moreover, fiscal health was proxied by the revenue ratio alone; although this is a recognized metric, it captures only one dimension of broader fiscal stability (Jimenez & Afonso, 2022).

A further limitation is the **absence of qualitative insights**. While this study employs rigorous quantitative methods, it lacks the lived perspectives of city finance officers, elected officials, or administrative staff. Interviews or surveys could reveal contextual factors, strategic decisions, and institutional constraints that do not appear in fiscal data.

Future research should employ **longitudinal or panel-data techniques** to trace how cities' revenue structures and fiscal outcomes evolve through policy cycles, economic downturns, and population shifts. **Mixed-methods**

approaches, integrating fiscal data with qualitative case studies or elite interviews, could provide a more holistic picture of revenue planning and financial decision-making. Comparative studies across **small versus large cities**, or across governance forms, would also enrich the understanding of how local context mediates fiscal capacity and diversification outcomes. These extensions will build on this study's foundation and deepen our knowledge of municipal fiscal resilience.

7. Conclusion

This study examined the relationship between **revenue diversification** and **fiscal health** among large U.S. cities using standardized fiscal data from 2000 to 2016. The findings support the theoretical proposition that a diverse portfolio of revenue streams—particularly those sourced locally—strengthens cities' ability to maintain financial stability and withstand fiscal shocks. **Own-source revenue** emerged as the strongest positive predictor of fiscal health, while tax effort and intergovernmental transfers showed more limited or inconsistent effects.

The study's contribution lies in its **empirical validation** of revenue diversification as a strategic tool for enhancing urban fiscal resilience. In doing so, it provides a quantitative benchmark for city finance officers, urban economists, and policymakers to consider when evaluating revenue portfolios. Empowering cities to broaden and balance their revenue sources is not only sound financial practice—it is a safeguard for continuity in public service delivery.

Based on the results, this paper recommends the **integration of own-source revenue indicators** into fiscal planning frameworks and performance reviews. Such metrics can help municipalities benchmark their progress and identify risks associated with over-reliance on volatile or externally controlled funds. Additionally, **institutional reforms** at the state level—such as legal autonomy over local taxation, improved fiscal transparency, and technical support—are critical enablers of effective revenue diversification.

Ultimately, revenue diversity is more than a fiscal metric. It is a form of **strategic resilience**, enabling cities to tailor financial strategies to their unique economic, demographic, and political realities. As U.S. cities continue to face uncertainty from economic cycles, demographic shifts, and federal funding volatility, cultivating robust and flexible revenue systems will remain a cornerstone of sustainable urban governance.

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