



RESEARCH PAPER

Income and Expenditure Relationship in Local Municipalities: A Case Study of Sindh Province

¹Jhman Das Hirani*, ²Rafique Ahmed Chandio and ³Muhammad Akram Gilal

1. PhD Scholar, Department of Economics, University of Sindh Jamshoro, Sindh, Pakistan
2. Professor, Department of Economics, University of Sindh Jamshoro, Sindh, Pakistan
3. Professor, Department of Economics, University of Sindh Jamshoro, Sindh, Pakistan

***Corresponding Author:** jrhirani@yahoo.com

ABSTRACT

This research paper examines the effect of income over expenditures in local municipalities of Sindh. The major income sources are provincial grants and local revenue generated through local taxes and bills. The relationship between income and expenditure is analyzed through Ordinary Least Square (OLS) and Fixed Effect Method (FEM) using time series data (for years 2014-2023) and panel data includes time and entities. The results reveal a significant positive effect of income on expenditure. The relationship shows that expenditure increases more than income both individually and collectively. Surprisingly, these local municipalities do not default despite higher expenditure than income as per relationship. However, the income estimate of both time series and panel data estimation method is larger than unity value. This could be because expenditures on municipal services are investments which return in the form of income. This relationship may be exploited and upscaled to increase local income of municipalities.

KEYWORDS Local Council Revenue, Local Government Sindh, Municipal Expenditure, Municipal Income, Spending

Introduction

The Municipality refers to the political subdivision of any country including city, town, state, or village, as defined by Britannica. Whereas municipal services are the services provided by local municipalities within their jurisdiction including drinking water, sanitation services and refuse collections as mandated under The Sindh Local Government Act, 2013. Local municipalities are required to render basic services including (but not limited to) water supplies, sewerage and sanitation, removal of refuse, education, and public health (Morudu, 2017).

Likewise, the municipal income refers to the revenue which a local council either generates through collection of taxes and bills against local services it provides to the citizens, or it receives in form of the grant from provincial and/or federal government. Municipal income depends upon the taxes and bills paid by people in exchange for the services rendered by these local municipalities (Bullerjahn and Jens, 2020). It is a social agreement between local government and its citizens where people have to pay taxes and bills and local government has to provide basic services (Everest-Philips, 2010).

Though available literature argues that abolition of Octroi / Zila tax has dwindled income generation capacity of local municipalities in Sindh province and have increased their dependency on the provincial government for grants and transfers (Aftab and Raja, 2021). According to Deloitte (2018) local councils depend on grants for inter-governmental transfers. Local Charges are not updated. Property taxes are not revised and updated as per market value. Overstaffing and lack of resources aggravates this situation. As a result, most of the budget of local municipalities is consumed on administration costs.

These services are rendered through allocated resources as per the annual budget books of local councils. The two major segregations of budget book are income and

expenditure. Bello and Madibbo (2015) explain that income is revenue which public authorities collect from citizens to finance their expenditures. Thus, income is funds which the government needs to finance different activities. This income is generated from various sources including taxes, fines, borrowing, fees etc. It further explains that the more income collected by the government, empowers it to initiate more expenditure activities. When this spending is done in prudent manner to enhance local government services in terms of wise investment then it tends to yield additional revenue in future.

The local government spending is broadly divided into two major categories i.e administrative and capital expenditures. Samaila and Saidu (2011) narrate that the administrative expenditures are recurrent expenditure required to pay salaries, pensions, contingency expenses, transportation, and utility charges. The capital expenditure is spent for acquiring or maintaining permanent assets including physical infrastructures and other related public service delivery.

Abba et al., (2015) revealed a relationship between expenditure and income. The research reveals that recurrent expenditures have a more significant relationship with local revenue generation due to multiplier effect. This study further confirms that spending on capital formation and services provision generates more revenues compared to the administrative expenses which are the running cost of local government.

Maher et al., (2016) assert that the income and expenditure have a direct relationship with rating of municipalities. The factors that determine the services status include quality of service, rendered care, citizens' expectation and ranking of their satisfaction (Carazas et al., 2023; Zivkovic, 2019).

Thus, it is apparent that those entities of local government, which generate more revenue, also spend more on expenditures, which in turn improves quality of life of their citizens. Furthermore, the larger autonomy of local councils in their income and spending generation not only enhances the effectiveness of their service delivery but also supports overall economic growth. Ligthart and van Oudheusden (2017) and Carniti et al. (2019) also support this argument and emphasize that fiscal autonomy and decentralization of local councils has a positive effect on growth.

Although the available studies show the overall expenditure and income share in local municipalities with a focus on segregating both spending and revenue in different sub-heads like running cost, operational cost, capital cost on expenditure side and grants / receipts along with local revenue on income side. However, no specific empirical study has been conducted so far to quantify the impact of income on municipal corporations' expenditures.

This study bridges this gap and examines the effect of income on expenditures of the municipal corporations located in Sindh province. The study uses ten years of time series data as well as panel data on four cross-sections. The estimation methods employed in this study are the ordinary least square method and fixed effect method of panel estimation. Panel data estimation procedures have significant advantages over time series and cross section data (Baltagi, 2008). Panel regression is more informative and reliable for ensuring enhanced variability, lesser collinearity of variables. It provides sufficient degree of freedom in estimations and efficiency. Results obtained from time series and panel data estimation methods indicate significant positive effect of income on expenditures of local councils. However, the income is significantly larger than unit value which implies that local councils spend more as their income increases. This could be because local councils spend more on capital formation and services provision as their income rises which further generate their income. Hence both income and expenditure reinforce each other.

The rest of the paper proceeds as: section 2 contains the review of past studies focusing on service delivery of municipal corporations around the world and how income

impacts the service delivery of these corporations. Data discussion that includes its source, descriptive statistics and graphical representation is given in section 3. The methods employed for examining the interaction between income and expenditure of the municipal corporations are given in section 4 followed by results and discussions in section 5. Section 6 concludes and provides policy recommendations for improving service delivery of the municipal corporations.

Literature Review

Jacques (2023) asserts that the willingness to pay taxes depends on multifaceted factors including education, income level and quality of service provided by the government. These factors are in hot discussion these days in theory of state-building, to enhance people's willingness to pay taxes. It explains that even people with average income of middle class are more willing to pay taxes, based on their socio-academic background and satisfaction from government service deliveries.

Khan et al., (2022) enunciates that there is a social agreement between state and citizens for services rendered and taxes paid respectively. This relationship becomes more significant when it comes to local government. When citizens don't receive quality service, they are not willing to pay a local tax, which in turn affects the income of local councils.

Jarnberg and Varja, (2021) estimate a strong association between expenditures and local level income growth of municipalities in Sweden. This study emphasizes that government budget allocation and expenditures are related to income growth rate of local area.

Although some theoretical literature recommending amalgamation in local government system for self-sufficiency and better service delivery. However, empirical studies reveal otherwise. The experiences of amalgamation produced no evidence to affect local government expenditure, income, or service deliveries. Though some amalgamation models have reduced administrative expenditures whereas, no significant effect on overall spending, income, or service delivery in different municipalities, including both small- and large-scale entities have been found (Allers and Geertsema, 2016).

Kuntari et al., (2019) stress that resource allocation is one among major issues for budget allocations in public sector specially the income and expenditure budgets due to resource constraints. This directly affects local government allocation of development spending. This allocation depends on local revenues, and priorities on funding allocations. Holcombe & Lacombe, (2004) narrate that when local tax is collected and added with federal tax then these two levels of government taxes collected at same tax base results in high inefficiency due to combined tax rate effect.

Sami et al. (2016) narrates the alarming status of service delivery of local government in Sindh. This assessment highlights that even basic services such as water and sanitation are not provided. This report predicts a further decline in the provision of these services.

Methodology

The data for this study was collected from certified audit copies and budget books from four different municipalities. They include Hyderabad Municipal Corporation (HMC), Mirpurkhas Municipal Corporation (MMC), Qasimabad Municipal Committee (QMC) and Digri Town Committee (DTC). Ten years income and expenditure data, for the period of 2014 – 2023, was collected. The data is log transformed before being used in the analysis. This is done to normalize the data distribution and to stabilize the variance of residuals. It is also useful to mitigate outliers' effect and to enhance interpretations. Further the log

transformation of the data enables us to interpret the estimated parameters in terms of elasticities.

Table 1 shows descriptive statistics of income and expenditures for all municipal corporations. Mirpur Khas Municipal Corporation has the highest average income followed by Qasimabad Municipal Corporation. Also, both these municipal corporations have the highest median incomes. However, QMC and HMC have more volatile income. Jarque Berra Normality test estimate also indicates normal distribution of income for all the municipalities.

Table 1
Descriptive Statistics of Municipalities Income & Expenditure

Income						
Council	Mean	Median	Maximum	Minimum	Std. Dev	JB Test
HMC	2.66	2.64	2.74	2.59	0.054	0.84
MMC	3.01	3.02	3.06	2.95	0.039	0.95
QMC	2.92	2.90	3.06	2.80	0.096	0.87
DTC	2.34	2.33	2.40	2.27	0.042	0.57
Expenditures						
Council	Mean	Median	Maximum	Minimum	Std. Dev	JB Test
HMC	2.592	2.579	2.722	2.479	0.091	0.961
MMC	3.001	2.995	3.054	2.935	0.042	0.622
QMC	2.945	2.942	3.069	2.849	0.077	0.785
DTC	2.318	2.323	2.389	2.227	0.050	0.477

Note: HMC, MMC, QMC and DTC refer to Hyderabad Municipal Corporation, Mirpurkhas Municipal Corporation, Qasimabad Municipal Corporation and Digri Town Committee. Std. Dev and JB refer to standard deviation and Jarque Berra normality test.

Lower panel of table 1 shows descriptive statistics of the data of the municipal corporations. It indicates that MMC has the highest average expenditures followed by QMC. Similarly, MMC and QMC have the highest median value of expenditures. QMC has the maximum expenditure and DTC has the lowest level of expenditure. Also, HMC expenditures are more volatile followed by QMC. Jarque Berra normality test estimate indicates that data on expenditures for all the municipal corporations has normal distribution.

Figure 1 shows???? the municipalities income and expenditure for the given sample period. It is evident from the figure that both move in the same direction. There is an increase in both these variables during the sample period. The expenditure seems less than the income for all municipalities except Hyderabad from 2021 and onwards. For this time, the income and expenditures of Hyderabad Municipal Corporation appear to be the same.

To examine the interaction between income and expenditures, a total of four municipalities, varying in size and operational scale, including two municipal corporations, one municipal committee and one town committee, were selected from two divisions of Sindh province. Two empirical methods are applied to conduct the analysis. Ordinary least square method is applied for estimating the following equation using time series data:

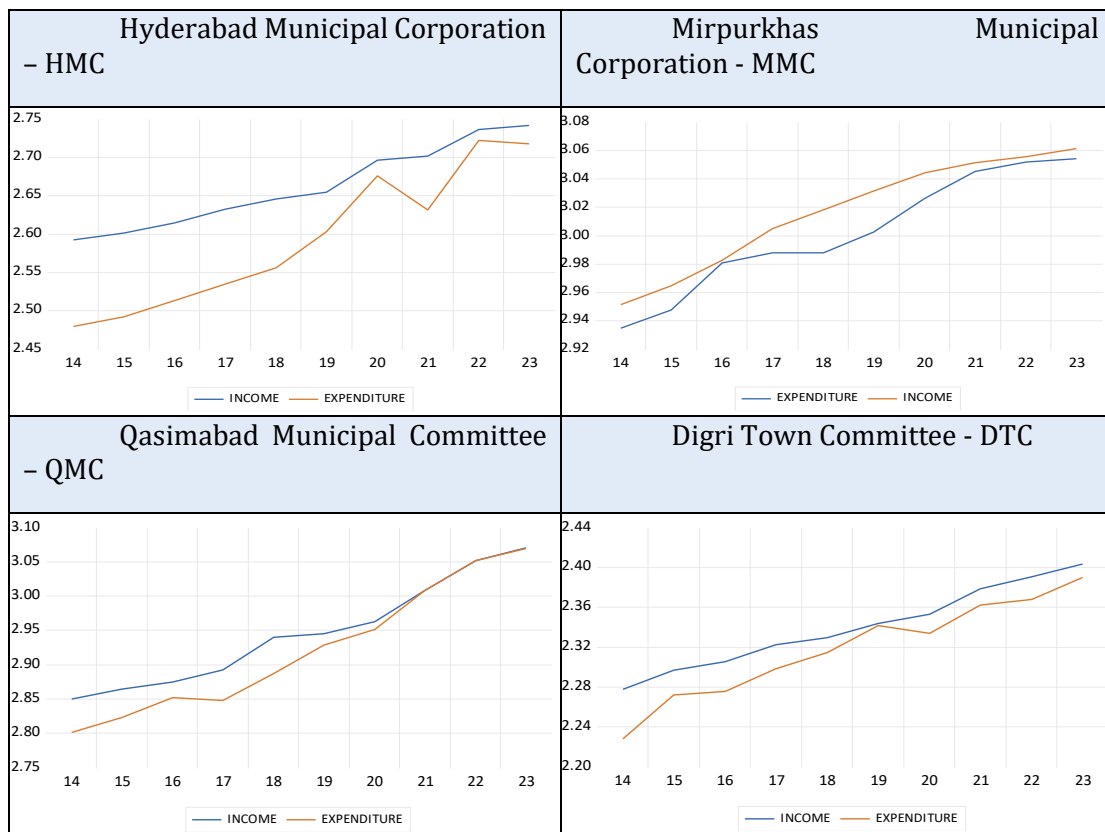


Figure 1 Income and Expenditures of the Municipalities

$$exp_t = \alpha + \beta x_t + u_t \dots\dots\dots (1)$$

exp and *x* represent expenditures and income of the municipal corporations. α and β are intercept and slope parameters. In fact, β represents the sensitivity of the local council expenditure sensitivity to their income. *u* refers to stochastic disturbance term and includes the effect of all omitted variables on the dependent variable. Subscript *t* shows that time series data is used for estimating the equation.

Besides time series and ordinary least square estimation method, this study also uses panel data and fixed effect method of estimation. Panel data has certain advantages over time series data. Panel data combines both time series and cross-section observations and thus gives more informative data, more variability, less collinearity among the variables, and enhances degrees of freedom. Also results based on panel data estimation procedure can be generalized for policy purposes. Because of these advantages of panel data, this study pool the data on income and expenditures of the municipal corporations and estimates the following equation suing fixed effect method:

$$exp_{it} = \alpha + \beta x_{it} + u_{it} \dots\dots\dots (2)$$

Results

Table 2 contains ordinary least square estimates of income and expenditure regression equation for Hyderabad Municipal Corporation, Mirpur Khas Municipal Corporation, Qasimabad Municipal Corporation and Digri Town Council. The results indicate a significant positive effect of income on expenditures of the local councils. The estimate of income is larger than one which implies a larger change in the municipal corporations'

expenditures due to a change in their income. However, there is variation in the effect of income on the

Table 2
Ordinary Least Square Results

MC	HMC	MMC	QMC	DTC
Constant	-1-1.802(-6.677) **	-0.145(-0.550) **	-0.678(-4.116) **	-0.454(-2.295) **
x_t	1.651(16.283) *	1.04(11.087) *	1.222(21.840) *	1.184(14.018) *
Residual Diagnostics				
R^2	0.97	0.94	0.98	0.96
Adj R^2	0.96	0.93	0.98	0.95
DW	2.396	1.081	1.944	1.340
F-Statistic	265.138	141.099	477.002	196.516
LM Test	0.716[0.526]	2.597[0.153]	1.553[0.286]	0.085[0.919]
ARCH Test	2.744[0.14]	0.137[0.721]	0.129[0.729]	0.174[0.688]
JB_{NOR}	0.099[0.952]	0.499[0.778]	1.595[0.450]	0.154[0.925]

Note: DW, LM, ARCH and JB indicate Durbin Watson, Lagrange Multiplier, Autoregressive Conditional Heteroscedasticity and Jarque Bera normality test, respectively. **, * represent five percent and one percent significance level of estimated parameters. Values given in parentheses are t-statistics representing the significance of the estimated parameters. Probability values are given in brackets.

Municipal corporations' expenditures. It varies from 1.04 for Mirpur Khas Municipal Corporations to 1.65 for Hyderabad Municipal Corporation. The lower panel of the table shows residual diagnostics. Furthermore, the coefficient of determination (R^2) shows the variation in the dependent variable explained by the estimated model. There is variation in the estimate, and it ranges from 0.94 for MMC to 0.98 for QMC. Durbin Watson test statistics estimates range from 1.08 for MMC to 2.396 for HMC. The estimates of DW test statistics are larger than the coefficient of variation implying that the estimated regression is not spurious. The probability Lagrange Multiplier (LM) tests and auto regressive conditional heteroscedasticity (ARCH) test statistics are quite large implying that the estimated residuals are neither serially correlated nor have heteroscedasticity issue. Jarque Bera tests statistics further show that the residuals of the estimated model have normal distribution.

Table 3 shows fixed effect method estimates of equation (2). It indicates that income has a positive effect on the local council expenditure. Thus, the estimate of income is positive and significant and positive at one percent significance level. Also, the estimates parameter is more than unity implying that any change in income of the municipal corporation results in larger change in the expenditure of municipal corporation. Thus, our estimates of fixed effect methods are in line with our ordinary least square method estimates. Hence the conclusion that income has positive and significant effect on the municipal corporation's expenditure cannot be rejected based on results from ordinary least square method and panel data fixed effect method of estimation. Results further indicate that the estimated model explains ninety eight percent of variation in the dependent variable.

Table 3
Fixed Effect Method Results

All Councils	FEM Results
Constant	-1-0.112(-2.282) **
x	1.029(57.739) *
R^2	0.98
Adj R^2	0.98

F Statistic

3333.861

Conclusion

This research paper is intended to estimate the relationship between income and expenditure through the application of regression models. The findings of both OLS and FEM models predict a strong relationship between predictor and criterion variables. Panel data estimation depicts that a 1% change in income raises the expenditures by 1.02% for all municipal councils collectively. Similar is the case with individual municipality where a positive association between income and expenditure is evident. The 1% rise in income increases the expenditures by 1.65% for HMC, 1.04% for MMC, 1.22% for QMC and 1.18% for DTC.

Though, while comparing municipal income manually with expenditures we find that by the end of each fiscal year the available income is more than expenditure in real terms. However, the regression results obtained for each individual municipality shows that expenditure tends to be more than income. Furthermore, the regression results for all councils collectively also express a similar relationship between income and expenditure.

Surprisingly, despite a significant persistent rise in expenditure these councils don't default. The rise in grant percentage each year each year due to possible inflation has a similar effect on expenditure side. This indicates that other than the regular change in amount of provincial grant there is also substantial contribution of local revenue which is affecting overall income of municipalities.

The further in-depth exploration of income and expenditure data it is found that expenditure on rewarding services of local councils contributes to an increase in local income. Hence, before going bankrupt by the cut off each fiscal year, these councils get additional local revenue generated through investment in "rewarding municipal services". This local revenue along with provincial grants work collectively to invest back in municipal services in form of municipal expenditures. This expenditure again causes local income to rise by the end of fiscal year. In economics terms this expenditure is a function of income which pushes income upward with its upscale rising.

The understanding of this expenditure association with income in 'rewarding municipal services' is crucial to divert local spending into prudent investments which will increase both service delivery and income of local municipalities. These investments include water supply services, charged public amusement facilities, municipal owned capital investments, commercial initiatives and other related works and services. This study intimates that there are untapped potential which policy makers can exploit to achieve the highest operating functionality of local municipalities in Sindh till they get an equilibrium in income and expenditure behavior.

Recommendations

The paper recommends that pilot initiatives to be encouraged and implemented by the government in urban areas first. Data suggests that HMC income return is highest compared to other municipalities which are analyzed in this research. This is due to the reason that urban councils have additional avenues of service revenues and additional income from property taxes, which is not collected in semi-urban and rural areas at similar pace. Thus, the pilot implementation of this expenditure function will provide tested evidence which may later be replicated and upscaled in entire Sindh province, for effective and efficient municipal service delivery.

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