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SPATIAL AUTOCORRELATION ANALYSIS OF THE FISCAL IMPACTS OF THE COVID-19 PANDEMIC ON PHILIPPINE LOCAL GOVERNMENT UNITS: A STUDY OF LUZON ISLAND

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Abstract

The COVID-19 pandemic has disrupted economic activities across Philippine Local Government Units (LGUs), resulting in significant fiscal implications. This study applied spatial autocorrelation analysis to a dataset covering around 15,480 data points from 645 LGUs (cities and municipalities) spanning 2009-2021, focusing on Locally-sourced Revenue (LSR) and Internal Revenue Allotment (IRA) dependencies. It assessed the fiscal impact of the pandemic by comparing actual 2021 LSR and IRA dependencies with their predicted levels. Pre-pandemic analysis identified "high-high" and "low-low" areas, revealing pronounced clustering of local economic advantages and disadvantages. During the pandemic, the majority of LGUs experienced negligible (36%) or slightly negative (27%) impacts on LSR dependencies with no spatial pattern found (Global Moran's I=0.001). Conversely, severe positive (49%) and negative (46%) impacts occurred on IRA dependencies with clear spatial autocorrelation (Global Moran's I=0.319). To address these disparities, policymakers are urged to implement proactive measures, including (a) targeted resource allocation and investments, (b) incentives for marginalized districts, (c) establishment of growth poles in lagging regions, and (d) enhance economic interconnectivity among LGUs.

Keywords: Community Resilience, Disaster Preparedness, Pandemic recovery, Spatial Analysis, Urban and Regional Planning

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INTRODUCTION

Fiscal decentralization in the Philippines commenced in 1991 with the legislative enactment of the Local Government Code (LGC). This has allowed the Local Government Units (LGUs) autonomy in their resource spending decisions based on the revenues they receive (Manasan, 2005). Republic Act No. 11964 defines Annual Regular Income (ARI) as the annual earnings, encompassing fees, and receipts, that local government units (LGUs) actually get from regular sources. This encompasses the National Tax Allotment (NTA) and additional portions of national wealth while excluding non-recurring revenues like national aid, grants, financial assistance, loan proceeds, asset sales, miscellaneous income, and analogous sources. In general, the two largest components of ARI an LGU obtains are Internal Revenue Allotment (IRA) and Local Source Revenue (LSR). IRA is an intergovernmental fiscal transfer of shares obtained from the national government. Meanwhile, LSR includes revenues obtained internally by an LGU. Both IRA and LSR are vital in the operations, deliverance of essential public services, and economic growth.

LGUs receive a fair share of IRA in accordance with the provision of LGC. However, several studies have shown disparities in economic growth. For instance, provinces remain highly dependent on the share they obtain from the national government despite the Philippines achieving overall economic growth. The growth has not reached the areas where it is intended (Cuaresma, 2019). Meanwhile, fiscal decentralization in the form of unconditional transfer has induced LGUs' overdependence on the national government (Panao, 2021). This heavy reliance on IRAs causes unpredictability and instability in local finances (Uchimura & Suzuki, 2009). There are also evidences that income generated locally are lesser in cities and municipalities that are more dependent on IRA. It is also alarming that LGUs that are reliant on the central government are more likely to allocate less budget on social and economic programs, which then fuels the cycle of dependency and underdevelopment (Panao, 2023). In contrast, those who are less reliant on the IRA are able to generate local income and spend a larger portion of their budget on public welfare initiatives (Panao, 2021). These observations raise doubt about one of the primary purposes of fiscal decentralization, which is to make the LGUs more fiscally autonomous.

This recurring fiscal issue has been further aggravated by the emergence of the COVID-19 pandemic, which has disrupted economies and societies on an unprecedented scale. In the Philippine context, hard and mild lockdowns were implemented from March to May of 2020. This resulted in negative repercussions on the economy, including a record-high decrease in the Philippine GDP and an increase in unemployment, affecting 90% of the labor workforce (Abueg, 2020; Lim, 2020). Despite government efforts to reduce the impacts of the pandemic on public health, the Philippines recorded the greatest

number of COVID-19 cases in Southeast Asia in the fourth quarter of 2020, according to the John Hopkins University Coronavirus Resource Center. Six months after the March 2020 lockdown, the Philippine economy commenced its recovery phase. Nonetheless, micro, small, and medium-sized firms (MSMEs) continue to grapple with substantial declines in demand and revenue, as seen by Shinozaki and Rao (2021). This reduces the recovery potential since most LGUs host MSMEs.

This report analyzes the financial effects of the COVID-19 outbreak on local government units in Luzon, the Philippines' largest and most economically vibrant island. Spatial and temporal trends in pre-pandemic LSR and IRA dependencies were essential in predicting the pandemic levels. Through the spatial autocorrelation analysis, areas where clusters or dispersion of fiscal dependencies and localized patterns of economic resilience or vulnerability are identified.

RESEARCH METHODOLOGY

Research Design

The research utilized a quantitative methodology, applying spatio-temporal analyses to examine the IRA and LSR connections of Philippine local government units on Luzon Island. A statistical technique known as spatial autocorrelation was applied to discern any noteworthy spatial patterns within these fiscal variables. The analysis was conducted using annual data spanning from 2009 to 2021, with resultant maps interpreted to detect clustering and dispersion patterns. To elucidate temporal trends, the Global Moran’s I index—a metric for spatial clustering—was utilized. Furthermore, the study evaluated the impact of the COVID-19 pandemic by measuring the deviation between actual and predicted values of IRA and LSR dependencies. LGUs exhibiting the most substantial deviation were identified as those most greatly affected by the pandemic's fiscal repercussions.

Study Area

Luzon stands as the Philippines' largest and most densely populated island, with coordinates at 16°N 121°E. It is home to seven regions encompassing 33 provinces, 72 cities, and 626 municipalities. It notably encompasses Manila, the capital of the nation and a significant metropolis, as well as Quezon City. Luzon, situated in the northern region of the Philippine archipelago, is bordered by the Philippine Sea to the east, the Sibuyan Sea to the south, and the South China Sea to the west. The Luzon Strait delineates its northern boundary from Taiwan. The island is vital to the nation's economy, functioning as the domicile of the National Capital Region, where most economic activity flourishes. The location map of Luzon Island is in Figure 1.

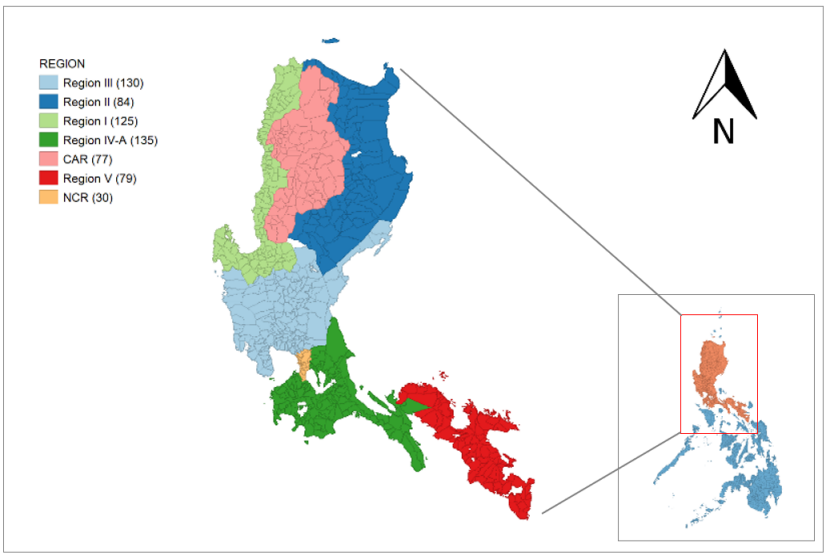


Figure 1: Location Map of Luzon Island, Philippines
Source: Map produced using GeoDa software (version 1.20)

Measure of Fiscal Impacts on Local Government Units

The basis for evaluating the fiscal impacts of the COVID-19 pandemic on the local government units are A) Locally Sourced Income (LSR) Dependency and B) Internal Revenue Allotment (IRA) Dependency.

A. Locally sourced Income (LSR) Dependency

Locally sourced income refers to the revenue generated by the local government unit (LGU) from taxes on real estate and local enterprises, as well as non-tax revenues derived from fees and charges associated with governmental activities. The Philippine Bureau of Local Government Finance (BLGF) states that the LSR can be calculated using the following formula:

$$\begin{aligned} &Locally\ Sourced\ Revenue\ (LSR) \\ &\quad = Real\ Property\ Tax + Tax\ on\ Business + Other\ Taxes \\ &\quad + Regulatory\ Fees\ (Permit\ and\ Licenses) \\ &\quad + Service\ or\ User\ Charges(Service\ Income) \\ &\quad + Income\ from\ Economic\ Enterprise\ (Business\ Income) \end{aligned}$$

LGUs that are highly dependent on LSR are more capable of obtaining income independently and are generally less dependent on the income shares they receive from the national government.

B. Internal Revenue Allotment (IRA) Dependency

The Internal Revenue Allotment (IRA) serves as the principal intergovernmental fiscal transfer in the Philippines (Senate Economic Planning Office, 2022). The IRA denotes the portion assigned to Local Government Units (LGUs) from the income produced by the Philippine government. LGUs receive IRA to sustain their government operations and finance projects, contributing to overall societal growth. The formulas for calculating IRA are provided in Section 284 of RA 7160, also known as the Local Government Code of the Philippines. The computation of IRA relies heavily on factors such as the type of government entity (province, city, municipality), the land area, and the population of its constituents. LGUs with larger land areas and populations are expected to receive larger IRAs.

IRA serves as a major funding source for many LGUs, with some heavily reliant on it. In fact, IRA can account for up to 98% of the budget for many LGUs (Cuaresma, 2019). High levels of IRA dependency are often observed in LGUs with limited capacity to generate local income. Additionally, IRA dependency tends to correlate with poverty incidence (Cuaresma, 2019).

Data Collection and Management

This study utilized fiscal data for the years 2009-2021, obtained from the Bureau of Local Government Finance (BLGF) of the Philippines, accessible at https://blgf.gov.ph. Only the municipal and city LGUs were considered in the study. In instances of missing data entries, linear interpolation was applied to estimate values for LSR and IRA dependencies. LGUs with at least three missing data points related to dependency were excluded from the analysis. Only 645 LGUs were analyzed after the pre-processing of the dataset. To visualize the results of the analysis, administrative boundary shapefiles sourced from the Humanitarian Data Exchange (https://data.humdata.org/) were employed.

Descriptive Statistics of LSR and IRA Dependencies

The interpretation of LGUs' LSR and IRA dependencies followed the categorization outlined in Table 1. For instance, LGUs with dependencies exceeding 5% are considered non-reliant on LSR and are likely dependent on the budget allocated by the national government. In contrast, LGUs with dependencies exceeding 50% are generally heavily reliant on LSR and are thus more self-sufficient in funding their expenses. Chloropleth maps were generated to visualize these dependencies in the pre-pandemic years of 2009, 2013, and 2017, as well as the pandemic year of 2021.

Table 1: Interpretation of LSR and IRA dependency

LSR/IRA Dependency	Interpretation
>5%	Not reliant on LSR/IRA
5%-20%	Slightly reliant on LSR/IRA
20%-50%	Significantly reliant on LSR/IRA
>50%	Heavily reliant on LSR/IRA

Source: Author-made Interpretation Scale

Spatial Autocorrelation of LSR and IRA Dependencies

The Moran's I statistic was employed to measure global spatial autocorrelation, which is a valuable tool for assessing the relationships among neighboring observations. This statistical method allows for the identification of interesting patterns and clustering among nearby observations. Moran's I shares similarities with the Pearson correlation coefficient and can be computed using the following formula:

$$I = \frac{N \sum_i \sum_j w_{ij} \frac{(x_i - u)(x_j - u)}{\sum_i (x_i - u)^2}}{\sum_i \sum_j w_{ij}}$$

In this context, N signifies the number of observations, w_{ij} indicates the spatial weight associated with the location of pair $_{ij}$, while x_i and x_j represent the variable values at positions i and j, respectively. This study employed the queen criterion of contiguity to ascertain spatial weight. This criterion delineates neighbors as spatial units that possess a shared edge or vertex. Moran's I values typically vary from +1 to -1. Moran's I values approaching +1 signify positive spatial autocorrelations, indicating that observations with like values are likely to cluster together. On the other hand, Moran's I of -1 typically suggests negative spatial autocorrelation, indicating dissimilarity among neighboring observations. Values near 0 imply the absence of spatial autocorrelation.

Spatial autocorrelation results are commonly visualized using a Local Indicators of Spatial Association (LISA) cluster map, which provides insights into spatial patterns and clustering of data. The LISA cluster map visualizes areas with clustering or association patterns, which can be classified as either High-High, High-Low, Low-Low, or Low-High. High-high and low-low clusters represent regions with positive and negative global autocorrelation, respectively. Conversely, High-Low and Low-High regions may be described as spatial outliers where neighboring locations exhibit dissimilar values. Spatial autocorrelation was performed on data covering the years 2009 to 2021 using GeoDa software (version 1.20).

Impacts of COVID-19 Pandemic on LSR and IRA Dependencies

The LSR and IRA dependencies of each LGU from 2009 to 2019 were utilized to predict the 2021 LSR dependency values. These values were forecasted using the exponential smoothing algorithm. The forecasted 2021 dependencies were then compared with the actual 2021 dependencies. The deviation from the predicted value served as the measure of the fiscal impact of the COVID-19 Pandemic on the LGUs and was interpreted using the scheme in Table 2.

Table 2: Interpretation of the deviation of LSR and IRA dependency

Deviation	Interpretation
>10%	Severe negative impact
2%-10%	Slight negative impact
-2%2%	Negligible impact
-10%-2%	Slight positive impact
< -10%	Severe positive impact

Source: Author-made Interpretation Scale

ANALYSIS AND DISCUSSION

Descriptive Statistics: LSR Dependencies

The chloropleth maps of LSR dependencies (Figure 2) show that a significant proportion of Philippine LGUs (ranging from 42% to 49%) exhibit a slight reliance on LSR. These LGUs are scattered throughout Luzon but are primarily concentrated in the central and coastal regions of the island. LGUs with a substantial dependence on their LSR include those in the National Capital Region, as expected, and urban centers and cities in each region. Notably, LGUs are surrounding these areas with a significant reliance on their LSR. Conversely, LGUs that do not heavily rely on their LSRs are concentrated in the north-central part (the Cordillera region) and the southeastern part of the island. This pattern is not surprising, as both regions face geographic disadvantages, such as mountainous topography in the Cordillera and distance from the urban capital. Such disparities may be accounted to the past patterns on investment allocation where concentrations of investment are evident in few metropolitan centers, causing high levels of poverty in rural regions (Rondinelli, 2011)

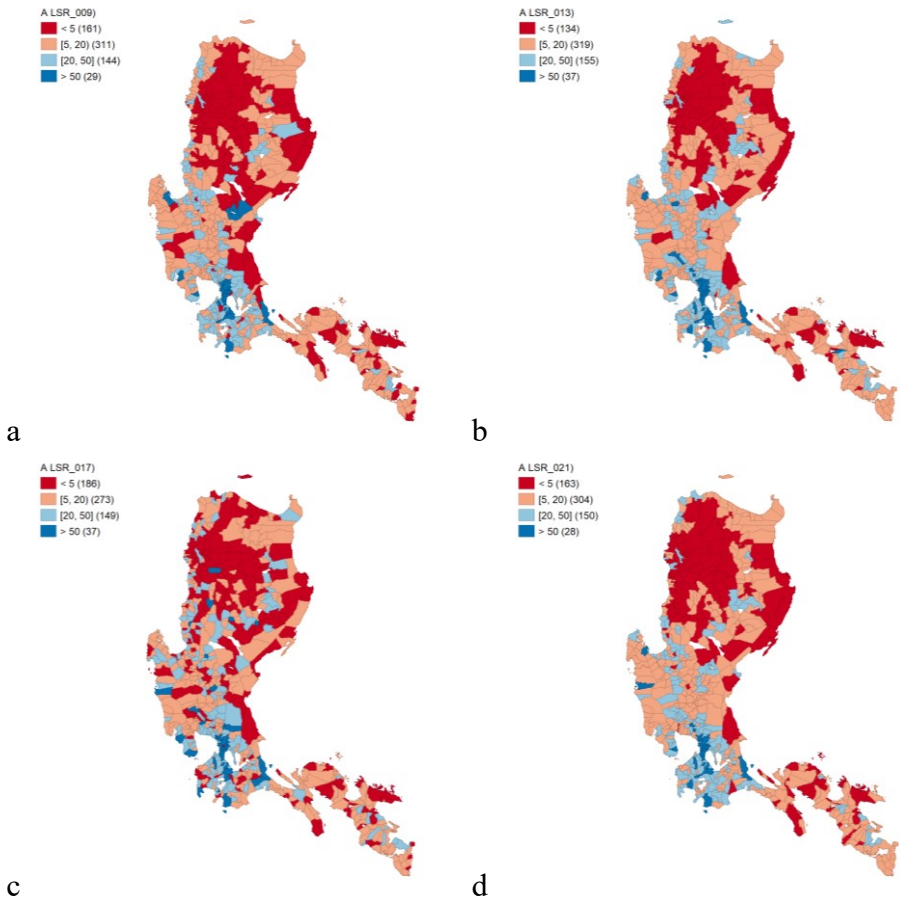


Figure 2: LSR dependencies of LGUs in Luzon Island during (a) 2009, (b) 2013, (c) 2017, and (d) 2021
Source: Map produced using GeoDa software (version 1.20)

Descriptive Statistics: IRA Dependencies

Most of the Philippine LGUs (ranging from 41% to 50%) are significantly reliant on their IRAs (Figure 3). LGUs that are consistently not reliant on their IRA include those of the National Capital Region and the surrounding municipalities belonging to Regions III and IV-A. Interestingly, some LGUs in Ilocos Sur and Pangasinan were generally not reliant on their IRAs in 2009 but have become more reliant on their IRAs as the years pass by. To explain the findings, further analysis of the Annual Regular Income (ARI) data from BLGF is necessary. It was revealed that some municipalities received significant shares of national tax collection, including (a) Tobacco Excise Tax (RA 7171) and (b) National Wealth

shares, both part of ARI but not categorized under LSR or IRA. RA 7171 grants Virginia Tobacco-producing provinces 15% of excise tax revenues, significantly boosting the finances of LGUs in Ilocos Sur and Pangasinan and reducing their IRA dependency. In contrast, LGUs heavily reliant on IRA and not on LSR are generally found in Regions Cordillera, II, III, and V. These observations hold true throughout the study period, with one exception being the year 2017, when LSR dependencies appear more scattered. Additionally, several municipalities consistently exhibit a heavy reliance on LSR, particularly those located on the eastern coastal areas of the island, including Regions II, III, and V.

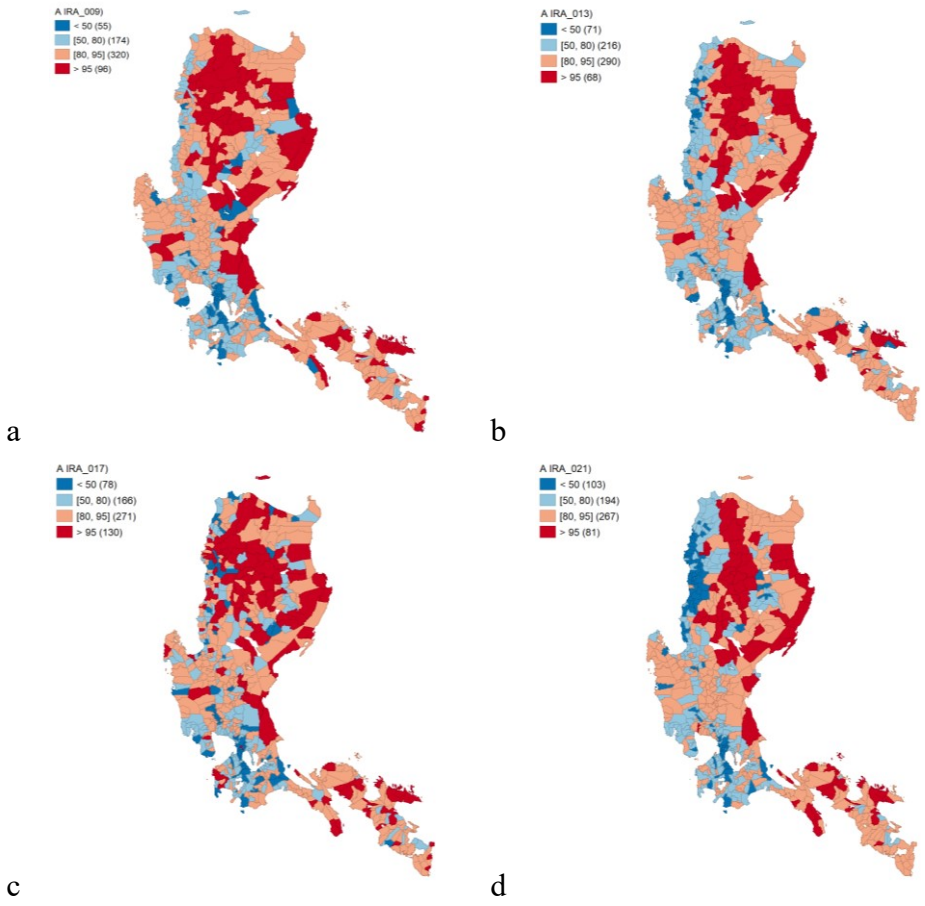


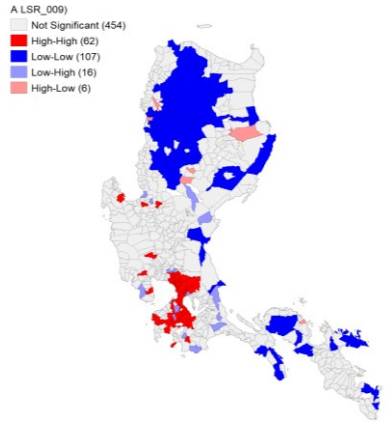
Figure 3: IRA dependencies of LGUs in Luzon Island during (a) 2009, (b) 2013, (c) 2017, and (d) 2021
Source: Map produced using GeoDa software (version 1.20)

Spatial Autocorrelation: LSR Dependencies

LISA cluster maps of LSR dependencies for the years 2009, 2013, 2017, and 2021 are presented in Figure 4. These LISA maps provide further evidence that aligns with the trends observed in the descriptive statistics. Areas classified as 'low-low' exhibit a relatively extensive presence throughout Luzon, which is indeed a cause for concern. Most of these areas are situated in the Cordillera region, but some can also be found in the eastern parts of Region III and Region V. These LGUs have low values of LSR dependencies and are surrounded by other LGUs with similarly low values. These areas demonstrate spatial autocorrelation, suggesting that this clustering of low LSR dependency is not merely the result of random chance. Consequently, these areas may be regarded as spatial clusters of socioeconomic disadvantage or localized poverty.

The extent of these areas gradually decreased and became more scattered from 2009 to 2017. Furthermore, several 'high-low' areas emerged, as expected from regional centers. Both of these trends indicate a more robust local economy during the 2009-2017 period. However, this trend was disrupted in 2021, when 'low-low' areas became more concentrated and expanded. Moreover, 'high-low' areas, where local economic development was anticipated to flourish, reverted to 'low-low' areas. This shift is highly likely associated with the ongoing freeze of economic activities during the onset of the pandemic.

Meanwhile, high-high areas are found on the NCR and nearby regional centers of Region III and IV. The trend has remained consistent throughout the 2009-2021 period. In an economic context, a "high-high" pattern might indicate that areas with strong economic activity or high incomes are concentrated in close proximity to each other, suggesting the presence of economic clusters or prosperous regions.



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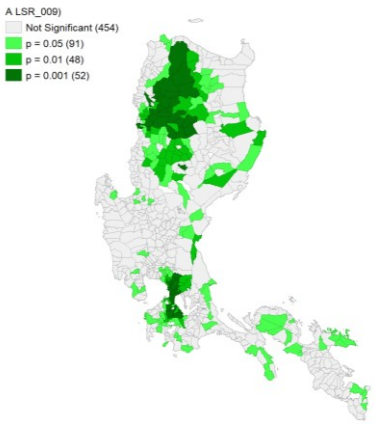

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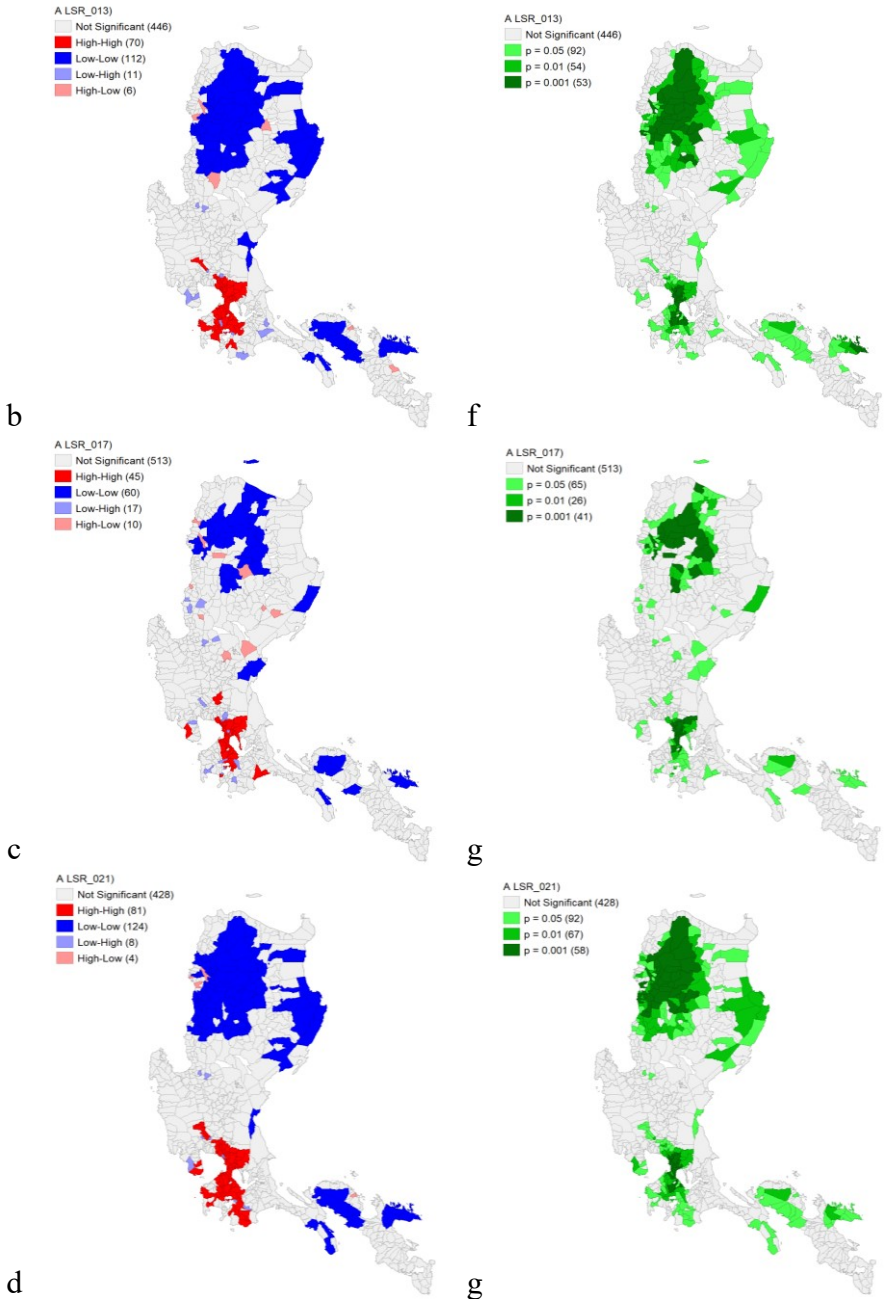
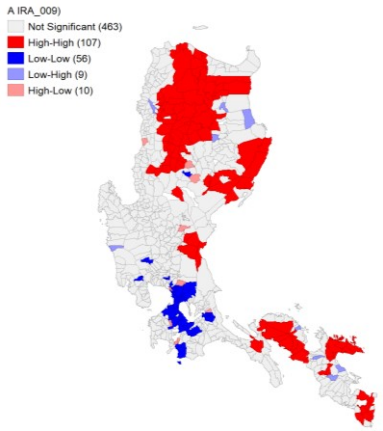


Figure 4: LISA cluster maps of LSR dependencies of LGUs in Luzon Island during (a) 2009, (b) 2013, (c) 2017, and (d) 2021, and their corresponding significance maps (e-h)
Source: Map produced using GeoDa software (version 1.20)

Spatial Autocorrelation: IRA Dependencies

LISA cluster maps of IRA dependencies (Figure 5) indicate that there are clusters of 'high-high' areas that are generally scattered but are concentrated in the Cordillera region, Region II, and Region V. Spatial autocorrelation results suggest that in these areas, local economies are not robust enough to reduce LGUs' reliance on the shares allocated to them by the national government. This is quite expected since LGUs that are located far from Manila are generally disadvantaged in many aspects, including economic, poverty, and human development (Tusalem, 2019). The trend appeared to be improving from 2009-2017, when there was less concentration and extent of high-high areas, which may suggest improved local economies. In fact, the number of LGUs in high-high areas has reduced from 107 down to 71. However, the occurrence of the pandemic has worsened the economic situation, resulting in a sudden increase in the number of affected LGUs to 120.

In contrast, 'low-low' areas, which are considered economically advantageous, are consistently found in the National Capital Region (NCR) and neighboring LGUs in Region IV-A. These areas are known to host highly urbanized cities and independent component cities, which are known to have the most dynamic and most resilient economies, respectively (Abner, 2020). Similar to the observations regarding LSR, the IRA situation improved from 2009 to 2017, with fewer areas classified as 'high-high.' However, this trend was disrupted in 2021 when areas became more concentrated and expanded. The primary cause of these changes in the fiscal landscape is attributed to the pandemic. It is also noteworthy that regions with 'low-low' areas have appeared, particularly in LGUs belonging to the provinces of Ilocos Sur and La Union. These LGUs receive shares from the Tobacco Excise Tax (RA 7171), which has been increasing throughout the period.



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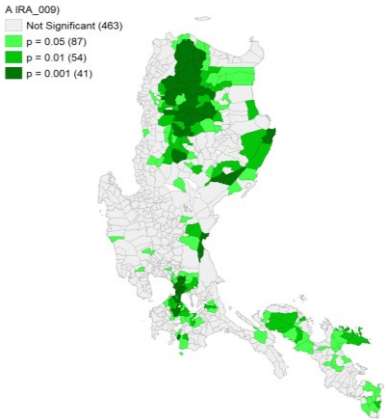

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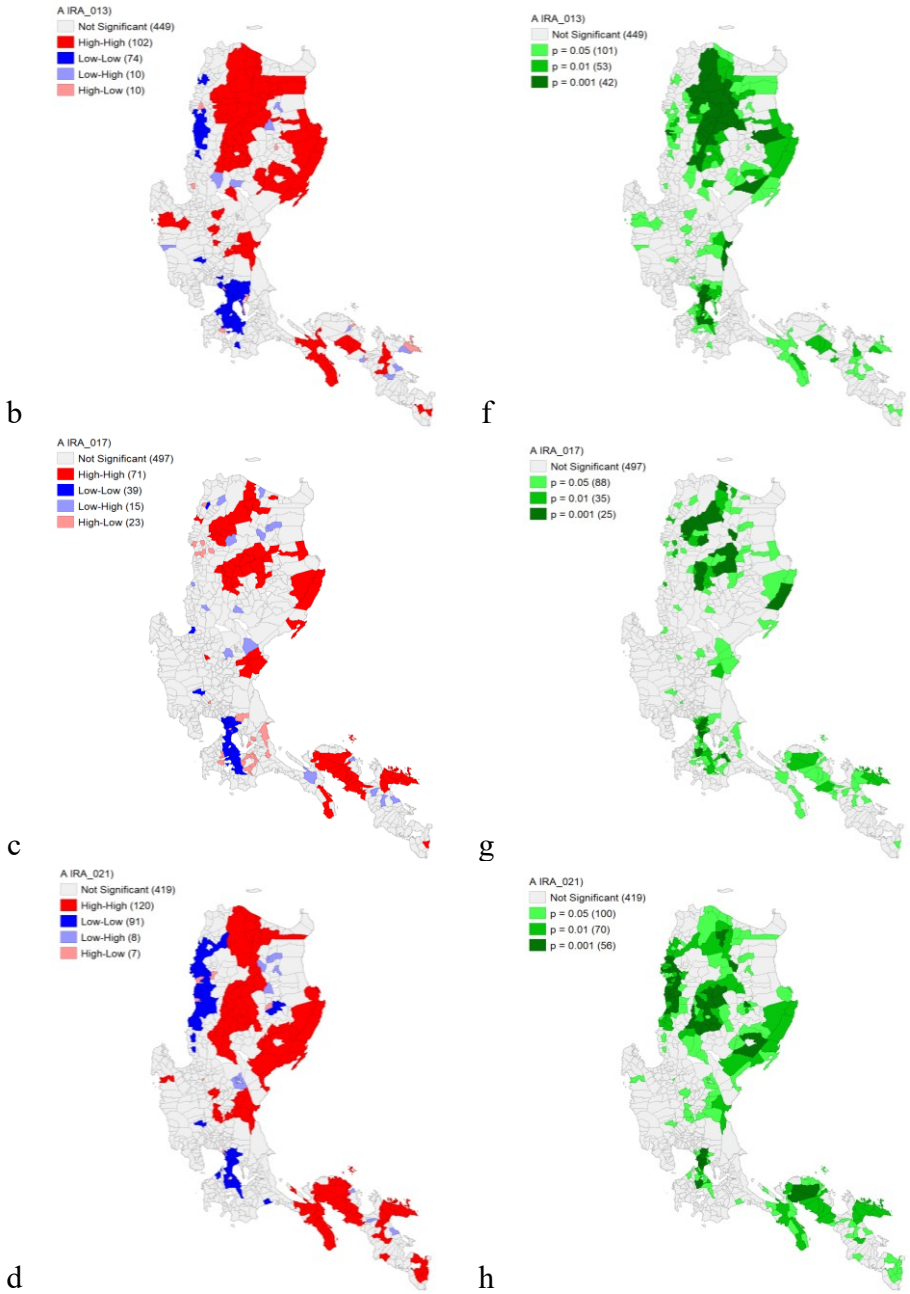

Figure 5: LISA cluster maps of IRA dependencies of LGUs in Luzon Island during (a) 2009, (b) 2013, (c) 2017, and (d) 2021, and their corresponding significance maps (e-h)
Source: Map produced using GeoDa software (version 1.20)

Trend in the Global Moran's I

The time series graph (Figure 6) of Global Moran's I for both LSR and IRA dependencies reveals values ranging from 0.214 to 0.614 for LSR dependencies and from 0.309 to 0.587 for IRA dependencies. All Global Moran's I values are positive, indicating that similar values tend to cluster together spatially, suggesting the presence of clusters.

The time series data shows that spatial clustering remained generally consistent from 2009 to 2021, aligning with Yeeles' (2015) findings of steady spatial income inequalities among LGUs over the past decade. However, a notable dip in clustering occurred in 2017, when Luzon experienced a scattering of the spatial trend, possibly indicating decentralization in LSR and IRA dependencies. This variation in Global Moran's I may be attributed to policy and economic changes following an administration shift, but further research is needed to confirm this.

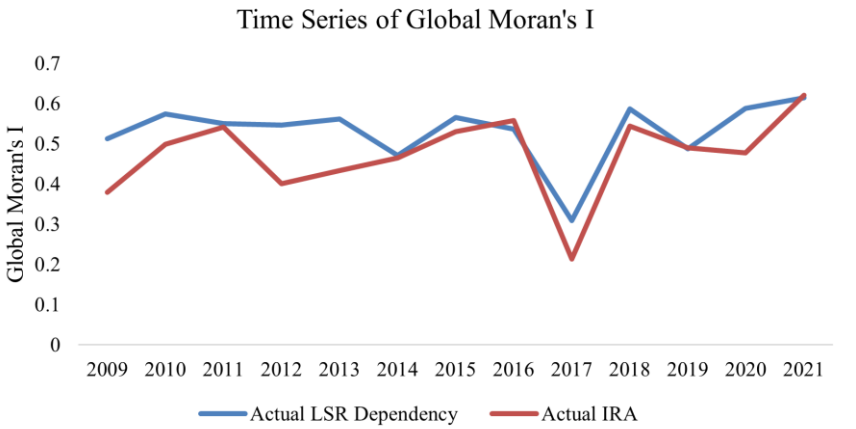

Figure 6: Time Series of Global Moran's I
Source: Author's own work

Impacts of COVID-19 Pandemic on LSR dependencies

The chloropleth map (Figure 7) illustrating the deviation from predicted LSR dependency values identified that the majority of LGUs have experienced negligible impact (36%), slight negative impact (27%), and slight positive impact (18%) on their LSR dependencies due to the ongoing COVID-19 pandemic. There is no apparent spatial pattern on the impact of the pandemic on LSR dependency. Furthermore, the LISA cluster displays a few areas classified as 'high-high' and 'low-low.' 'Low-low' areas are predominantly found in LGUs in the Zambales area, suggesting their fiscal resilience, despite the pandemic. In contrast, 'high-high' areas are generally scattered but are likely to be local urban

centers that have been heavily affected by the suspension of economic activities. Additionally, Global Moran's I value is 0.001, indicating that no spatial autocorrelation was found in the fiscal impacts of the pandemic on LSR dependencies.

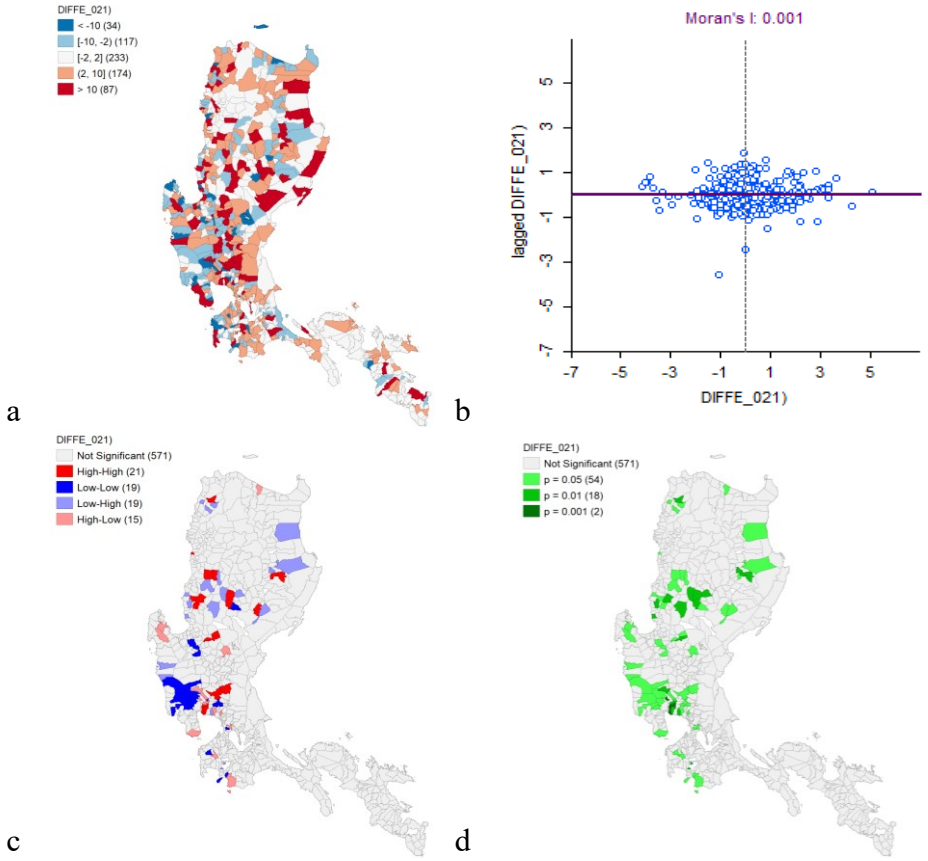

Figure 7: Deviation from the predicted LSR dependency of LGUs in Luzon Island during 2021 (a) Chloropleth Map, (b) Moran's Scatterplot, (c) LISA Cluster Map, and (d) Significance Map

Source: Map produced using GeoDa software (version 1.20)

Impacts of COVID-19 Pandemic on IRA Dependencies

The majority of LGUs have experienced severe positive impact (49%), and severe negative impact (46%) on their IRA dependencies due to the ongoing COVID-19 pandemic. Clusters of areas with similar values are now evident (Figure 8) but remain distributed throughout the region rather than being concentrated in a few areas. The LISA cluster map displays a few areas classified as 'high-high' and

'low-low.' 'Low-low' areas are mostly found in LGUs in Regions II, III, and IV. Meanwhile, 'high-high' areas are primarily limited to Region I but may also be found in Region II. Global Moran's I value is 0.319, indicating spatial autocorrelation in the fiscal impacts of the pandemic on IRA dependencies.

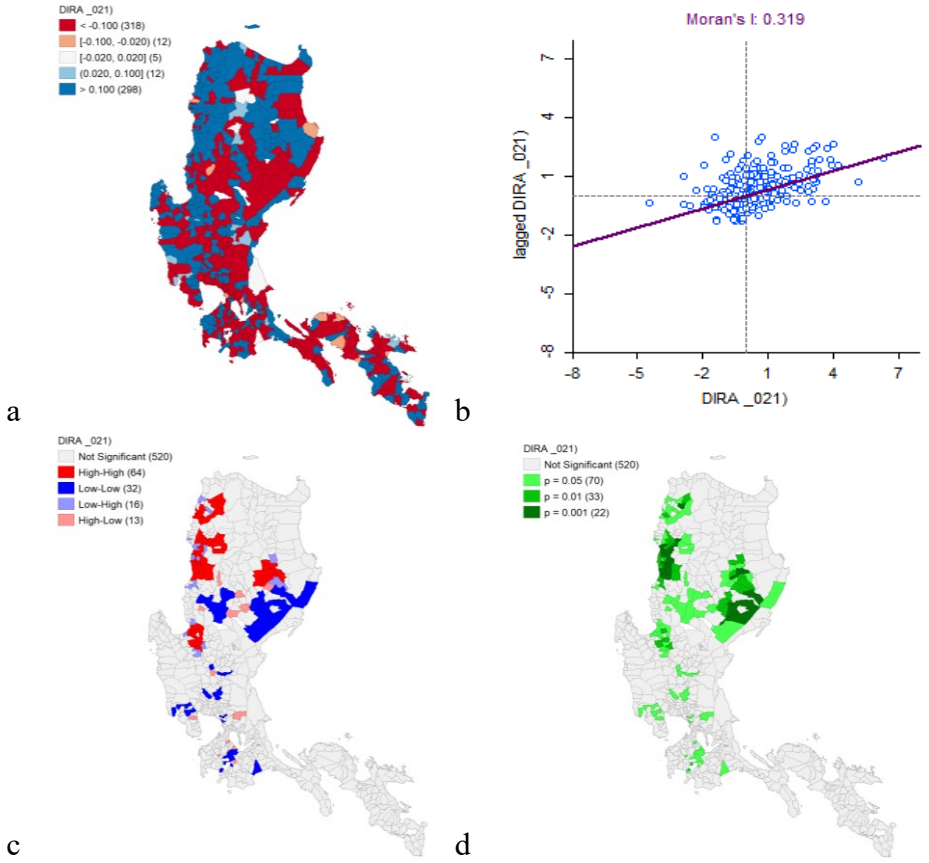

Figure 8: Deviation from predicted IRA dependency of LGUs in Luzon Island during 2021 (a) Chloropleth Map, (b) Moran's Scatterplot, (c) Cluster Map, and (d) Significance Map

Source: Map produced using GeoDa software (version 1.20)

CONCLUSION AND POLICY RECOMMENDATIONS

The results of this study provide an overview on the fiscal situations of LGUs in Luzon, both before and during the pandemic. For instance, the identified "low-low" areas provide evidence of the presence of regions facing economic disadvantages. Consequently, policymakers are encouraged to allocate resources

and investments to uplift these areas and improve their economic conditions. Carlos et al. (2023) underscored the government's responsibility in allocating the nation's resources to fulfill human needs. In the context of the pandemic, the healthcare system is above any other type of spending and could be focused on reducing loss in the country's GDP (Monsod and Gochoco-Bautista, 2021). Furthermore, the intervention of the Philippine government to give incentives to tobacco-producing provinces has improved the IRA dependencies of the recipient and the adjacent LGU. This instance suggests the effectiveness of targeted intervention to economically marginalized districts. Additionally, it may also catalyze the diversification of revenues due to improved local economies and a reduction of reliance on intergovernmental transfers.

It is suggested to establish a growth pole in lagging regions, aligning with Andriesse's (2017) recommendation. Policymakers should focus investments in these areas to cascade economic progress and address disparities in LGU fiscal dependencies, which are regional and national concerns. Regional development initiatives should aim to evenly distribute economic activities, reduce "high-high" concentrations, and enhance social services and infrastructure. Policies to improve economic interconnectivity among LGUs are also essential to link isolated districts with metropolitan areas.

The disruptions in 2021 warrant the need for robust pandemic preparedness and economic contingency plans at the LGU level. LGUs should proactively mitigate fiscal impacts from external shocks by adopting data-driven strategies and continuously monitoring regional economic trends. This study could be a basis for developing and refining such strategies. Regular spatial analysis updates can support adaptive policymaking, while sudden fiscal changes may require investigation into underlying causes such as policy shifts and economic decisions.

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REFERENCES

Abner, R. A. (2020). Determinants of resiliency with economic dynamism as a mediating variable: Evidence from the cities and municipalities in the Philippines.

Abueg, L. C. (2020). Silver linings in Philippine history and macroeconomics of the COVID-19 pandemic response: beyond the longest lockdown. *Philippine Journal of Health Research and Development*, *24*(4), 50-61.

Andriesse, E. (2017). Regional disparities in the Philippines: Structural drivers and policy considerations. *Erdkunde*, 97-110.

Carlos, V. J. A., Eusebio, H., Vigonte, F., & Abante, M. V. (2023). Government economic policy: The Philippines post-pandemic economic growth. Available at SSRN 4460839.

Cuaresma, J. (2019). Strengthening the internal revenue allotment system towards greater equity in the Philippines. In J. Kim and S. Dougherty (Eds.), *Fiscal decentralisation and inclusive growth in Asia*, OECD Publishing, Paris. https://doi.org/10.1787/a1452c07-en.

Lim, J. Y. (2020). The Philippine economy during the COVID pandemic. Ateneo de Manila University.

Manasan, R. G. (2005). Local public finance in the Philippines: Lessons in autonomy and accountability. *Philippine Journal of Development*, *32*(2), 31-102.

Monsod, T. M. C., & Gochoco-Bautista, M. S. (2021). Rethinking "economic fundamentals" in an era of global physical shocks: Insights from the Philippines experience with COVID-19. *Asian Economic Papers*, *20*(1), 109-140.

Panao, R. A. L. (2021). Beyond flypaper: Unconditional transfers and local revenue generation in the Philippines, 1992–2016. *International Journal of Public Administration*, *44*(15), 1341-1354.

Panao, R. A. L. (2023). IRA and local fiscal governance in the Philippines. In *A better metro manila? Towards responsible local governance, decentralization and equitable development* (pp. 443-464). Singapore: Springer Nature Singapore.

Rondinelli, D. A. (1980). Regional disparities and investment allocation policies in the Philippines: Spatial dimensions of poverty in a developing country. *Canadian Journal of Development Studies/Revue Canadienne D'études du Développement*, *1*(2), 262-287.

Senate Economic Planning Office. (2022). Annual allocation of the internal revenue allotment in 2022. Retrieved from https://legacy.senate.gov.ph/publications/SEPO/AAG%20IRA%20in%202022__21March2022.pdf

Shinozaki, S., & Rao, L. N. (2021). COVID-19 impact on micro, small, and medium-sized enterprises under the lockdown: evidence from a rapid survey in the Philippines.

Tusalem, R. F. (2020). Imperial Manila: How institutions and political geography disadvantage Philippine provinces.

Uchimura, H., & Suzuki, Y. (2009). Measuring fiscal decentralization in the Philippines. *IDE Discussion Paper*, 209.

Yeeles, A. (2015). Intergovernmental fiscal transfers and geographical disparities in local government income in the Philippines. *Journal of Southeast Asian Economies*, 390-401.

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