Did Fiscal Outcomes and Government Employment Change Differently During the COVID-19 Pandemic by Municipality Socioeconomic Status? Evidence from New Jersey

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Abstract

The COVID-19 pandemic triggered a global health and economic crisis that profoundly impacted subnational governments. Among them, New Jersey stood out as one of the hardest-hit states, grappling with a significantly high COVID-19 death rate. This study delves into the fiscal implications of the pandemic on New Jersey municipalities and investigates potential disparities based on socioeconomic status (SES). Analyzing a panel dataset for 532 unique municipalities from the fiscal years 2014-15 to 2020-21, we find no reduction in total revenues, total expenditures, or government employment for the average municipality in New Jersey. However, differential effects emerged when considering SES. Lower SES municipalities received a 3% increase in state aid but experienced a 16% reduction in part-time public safety employees compared to higher SES counterparts. A high reliance on the property tax for local funding in New Jersey is one possible reason why municipalities across all SES levels were able to navigate the fiscal crisis caused by the pandemic.

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1. Introduction

Starting in early 2020, the global economic recession caused by the COVID-19 pandemic had a major impact on state and local governments. For example, state and local tax collections decreased by over $60 billion in the second quarter of 2020 compared to the second quarter of 2019 (U.S. Government Accountability Office, 2021). At the same time, state and local governments needed to respond to a once-in-a-century public health emergency resulting in 92 million COVID-19 cases and over 1 million deaths in the United States as of September 2022.

In the initial months of the pandemic, U.S. policymakers and public finance scholars were predicting potentially long-lasting, negative fiscal outcomes for state and local governments (Chernick et al., 2020; Clemens & Veuger, 2020; Eason et al., 2021; Park & Pathak, 2021; Guo & Chen, 2021; Gordon et al., 2020; McDonald & Larson, 2020). However, within the first year of the pandemic, the national economy started to recover. For example, the U.S. unemployment rate decreased to 6% in March 2021 from a high of 14.7% in April 2020.

[Insert Figure 1 about here]

However, this economic recovery was not even across all states and local areas. It is vital for policymakers and public finance scholars to understand local governments' budgetary responses to this extraordinary time, especially if there was variation in local government fiscal outcomes across states. Interestingly, as shown in Figures 1 through 3, there is no evidence of a reduction in total revenues, total expenditures, or total government employment for the average New Jersey municipality following the start of the pandemic. Clearly, the experience of the typical New Jersey local government may be significantly different from the experience of local governments in other states.

[Insert Figure 2 about here]

[Insert Figure 3 about here]

While it is important to understand changes in fiscal outcomes for the average municipality, it is also important to investigate the variation in local budgetary responses within a state. The health and economic effects of the pandemic were not evenly distributed across communities. Communities with lower socioeconomic statuses were most impacted by the health and economic emergencies caused by the pandemic (Parker et al., 2020). Therefore, it is vital to examine the differential change in fiscal outcomes following the COVID-19 pandemic by municipality socioeconomic status. To do this, the current study addresses the following research questions:

1. Did the amount of municipality revenues change in the pandemic-era relative to the years prior to the COVID-19 pandemic? Did this vary by revenue source? Did this vary across local government socioeconomic status?

2. Did the amount of municipality expenditures change in the pandemic era relative to the years prior to the COVID-19 pandemic? Did this vary by expenditure type? Did this vary across local government socioeconomic status?

3. Did the number of full-time and part-time employees change in the pandemic-era relative to the years prior to the COVID-19 pandemic? Did this vary by service type? Did this vary across local government socioeconomic status?

The current study addresses these research questions by studying New Jersey municipalities. New Jersey is an important case study because it was arguably one of the hardest hit states by the COVID-19 pandemic based on both its above average COVID-19 death rate and unemployment rate during the first year of the pandemic. Specifically, our study compiles a panel dataset of 532 New Jersey municipalities between the 2014-15 and 2020-21 fiscal years. We have data on

municipality revenues by source, expenditures by service type, and full-time and part-time employment by service type. This panel data allows us to observe two pandemic-era time periods (i.e., 2019-20 and 2020-21 fiscal years). We divide the 532 municipalities into three categories of socioeconomic status (lowest, moderate, and highest SES) based on their Municipal Revitalization Index (MRI) score. The MRI score is how the state government of New Jersey identifies municipalities with the most need of state financial assistance. Specifically, our panel data and a differences-in-differences regression approach that controls for municipality fixed effects allow us to estimate the change in the average fiscal outcomes by municipality SES before and after the 2019-20 fiscal year. Given our data has only two fiscal years during the pandemic-era, this study serves only as an exploratory analysis to examine the short-run changes in fiscal outcomes during the pandemic.

Our exploratory study reports three main findings. First, we find no statistically significant differences in the change in total revenues following the COVID-19 pandemic across the three municipality SES groups. Interestingly, we do find evidence of an increase in revenues from state aid following the start of the COVID-19 pandemic for municipalities in the lowest SES group compared to municipalities in the highest SES group. However, there were no differences in any other revenue category by SES group. Second, we find no statistically significant differences in the change in total expenditures following the COVID-19 pandemic across the three municipality SES groups. There were also no differences in expenditures by service type.

Lastly, we find no statistically significant differences in the change in total full-time and part-time government employees following the COVID-19 pandemic across the three municipality SES groups. However, we do find a practically and statistically significant

reduction in part-time public safety employees for municipalities in the lowest SES group compared to municipalities in the highest SES groups.

The remainder of this article is divided into five additional sections. The next section will describe prior studies on the relationship between COVID-19 and government finances, and it will provide detailed information about the New Jersey context for this study. The third section of this article describes the New Jersey municipality panel dataset compiled to address the three research questions described above. The fourth section explains the differences-in-differences regression model to estimate the changes in fiscal outcomes following the start of the COVID-19 pandemic by municipality SES group. The fifth and sixth sections of this paper will present the main findings and discuss the main conclusions of this study.

2.   Background, Literature Review, and Theoretical Framework

2.1. Prior Studies on COVID-19 and Government Finances

This literature review focuses entirely on prior studies researching U.S. subnational governments. See Grossi et al. (2020) for a review of budgeting responses to the pandemic in the international context. Most of the prior work investigating the budgetary responses to COVID-19 relies on pre-pandemic data and case studies to predict the effects of the pandemic on government fiscal outcomes (Chernick et al. 2020; Clemens & Veuger, 2020; Eason et al., 2021; Park & Pathak, 2021; Guo & Chen, 2021; Gordon et al., 2020; McDonald & Larson, 2020). This is primarily due to the lack of available data and the timing of when subnational governments publish their financial reports.

Chernick et al. (2020) use pre-pandemic era data on 150 fiscally standardized cities to forecast local government revenue shortfalls for the 2020-21 fiscal year. On average, they predicted revenue shortfalls between 5.5% and 9%, depending on the revenue structures and

fiscal conditions of the local government. For example, they suggest cities with less stable revenue sources to have the highest levels of revenue shortfalls.

Two prior studies conduct revenue forecasts using local government data in a specific state. Guo & Chen (2021) forecast revenue declines of over $5.1 billion for 411 Florida municipalities between FY 2021 and FY 2023 compared to pre-pandemic levels. They suggest there will be significant variation in revenue declines across these Florida municipalities depending on the revenue structure of a specific municipality. Similarly, McDonald & Larson (2020) suggest that revenue structure will have an important impact on how local governments respond to the economic crisis caused by the pandemic. They use data on county governments in North Carolina to predict that almost 50% of county governments in North Carolina will experience some form of fiscal stress during the 2020-21 fiscal year. This is primarily due to unstable revenue sources that these county governments collect.

Some prior studies conduct case studies on specific city governments to examine the pre-pandemic trends in the city government to make predictions about the likely impacts of the pandemic on the city government's budgetary response. Eason et al., (2021) conduct a case study on the city of Atlanta. Their analysis suggests the city's pre-pandemic large cash reserves, stable revenue sources, and diverse economy provides the city of Atlanta with a relatively better chance of maintaining government expenditures to meet the fiscal challenges of the COVID-19 crisis. Park & Pathak (2021) conduct a case study on New York City, and their assessment suggests New York City will have a longer road to recovery compared to other large U.S. cities due to their economy depending on tourism and office workers. These two case studies showcase how pre-pandemic conditions, like revenue structure and the diversification of the local economy,

contribute to how well a city government can weather the negative economic impacts of the COVID-19 pandemic.

There have been at least two prior studies that surveyed local government officials to better understand local leaders' perceptions of the fiscal problems created by the pandemic and also possible solutions that can alleviate these fiscal problems. Afonso (2021) surveyed North Carolina local governments to investigate how they were preparing for the 2020-21 fiscal year. Interestingly, Afonso (2021) finds that most of the surveyed local North Carolina governments expected a general-fund shortfall in FY 2021, and about half of surveyed governments were planning a hiring freeze. Benton et al. (2020) conducted in-depth interviews with 30 U.S. local leaders during the Summer of 2020 to inquiry about the fiscal impacts of the COVID-19 pandemic. Overall, almost all local leaders interviewed expressed significant concerns about the fiscal challenges currently facing their local government. One important element that came from these interviews was how important own-source and stable local revenues are during negative economic conditions.

To our knowledge, there has been only one prior study examining how budgetary policy has impacted changes in government employment during the COVID-19 pandemic. Green and Loualiche (2021) examine the casual effect of the CARES Act federal funding on subnational government employment. They find that the CARES Act federal funding prevented 401,000 state and local government workers from being laid off. They find the states that rely the most on unstable revenue sources, like general sales tax revenue, were the most positively impacted by the CARES Act funding. This suggests that a stable revenue structure has an important role in mitigating the fiscal crisis caused by COVID-19 pandemic.

The current study makes at least four contributions to the prior research on COVID-19 and its impacts on government finances. First, the current study is the first to examine the New Jersey context. New Jersey is an important case study because New Jersey was one of the first states impacted directly by the COVID-19 outbreak, and the impact was one of the most severe in terms of the number of COVID-19 deaths in the state. Additionally, New Jersey local governments, unlike some of the other states studied in prior work, had arguably a better revenue structure to withstand the economic crisis caused by the COVID-19 pandemic because New Jersey local governments have a high reliance on the property tax for local funding.

Second, the study contributes to prior studies by utilizing a panel dataset with two pandemic-era fiscal years (2019-20 and 2020-21), while many prior studies only forecast the effects on revenues and expenditures using pre-pandemic era data. This is important because the 2020-21 fiscal year was arguably a surprisingly positive fiscal year for some state and local governments as economic growth increased significantly and subnational government revenue collections increased (Auerbach et al., 2020).

Third, this study is one of the first to measure the changes in government employment by service type. Government employment is an important outcome because subnational government employment has yet to recover to pre-pandemic levels, even as subnational government revenues have recovered. Lastly, this study is one of the first to investigate possible differential changes in fiscal outcomes following the COVID-19 pandemic by the socioeconomic status of the local government.

2.2. The New Jersey Context

New Jersey is an important state to study when examining the changes in both the local government fiscal and employment outcomes during the COVID-19 pandemic for at least two

reasons. First, New Jersey was arguably one of the hardest hit states by the COVID-19 pandemic. For example, New Jersey was one of the first states to have a significant infection outbreak due to its proximity to New York City, which was the first epicenter of the United States COVID-19 outbreak. This left New Jersey hospitals and governments relatively less prepared to handle both the financial crisis and public health crisis caused by the pandemic. Second, New Jersey local governments have a relatively more stable revenue structure due to their reliance on property taxes to fund their expenditures compared to other local governments in the country. Below, we provide more details to support these two claims.

New Jersey's first confirmed case of COVID-19 was recorded on March 4, 2020 (O'Dea, 2021). This first confirmed case was a middle-aged male from Bergen County, which is a county right outside of New York City. New York City represents a major cultural and economic center for New Jersey residents in the north and central part of the state. Since New York City was one of the first hardest hit cities in the country by the COVID-19 outbreak, it is no surprise that parts of north and central New Jersey were one of the first areas in the country affected by the outbreak. As New York City began one of the first city-wide lockdowns in the country in early March 2020, Governor Phil Murphy followed suit and implemented a statewide lockdown in New Jersey less than three weeks later. The lockdown began with a March 17th executive order that closed casinos, racetracks, gyms, movie theaters, and malls. By March 21st, Governor Murphy had ordered all New Jersey residents to stay home with only rare exceptions.

These stay-home orders and lockdowns resulted in historically severe economic effects on New Jersey businesses and employment. Over 1.5 million New Jerseyans had submitted an initial jobless claim by the end of March 2020 (O'Dea, 2021). In April 2020, New Jersey's unemployment rate was 15.5%, and the state's unemployment rate would stay above 7% until

April 2021. For comparison, the national unemployment rate would peak at 14.7% in April 2020, and the national unemployment rate would fall below 6% by March 2021. These statistics suggest that the negative economic effects of COVID-19 were more severe and long-lasting in New Jersey compared to the national average.

New Jersey was one of the first states to experience the negative impacts of COVID-19 on the health and well-being of its residents. By the beginning of April 2020, the state registered over 34,000 COVID-19 infections and almost 900 confirmed COVID-19 deaths (O'Dea, 2021). At that time, New Jersey had the second highest number of COVID-19 deaths in the nation. New Jersey's public health crisis would continue to get worse over the year. By March 2021, New Jersey had the highest COVID-19 death rate in the country, which was 262 per 100,000 residents. By September 2022, New Jersey's COVID-19 death rate remained in the top ten in the country at almost 400 per 100,000 residents. One of the main reasons for the high death rate in New Jersey is due to the timing of the initial COVID-19 outbreak in the state. Since New Jersey was one of the first states affected by this novel virus, medical professionals were not able to implement some of the best practices for treating patients, learned much later during the pandemic, to reduce the likelihood of death (O'Dea, 2021).

While New Jersey local governments had less time than other parts of the country to prepare for the public health crisis caused by COVID-19, New Jersey local governments were uniquely fiscally prepared to handle the economic crisis because of the property tax. New Jersey local governments are relatively more dependent on local property tax collections compared to local governments in other states. For example, during FY 2020, 98.3% of New Jersey local governments' own source revenues came from property tax collections, which was the third highest level in the country behind Maine and Connecticut (Loughead et al., 2022). However,

many local governments outside of New Jersey rely on a more diversified set of local own-source revenue sources like general sales, gross receipts taxes, individual income taxes, and other tax revenue sources. For example, Maryland and Michigan both levy a local income tax. However, New Jersey local governments lack the authority to levy these other types of local taxes. One rare exception is that New Jersey does allow the local governments of Newark City and Jersey City, two of the most populated cities in the state, to levy a 1% tax on employers' gross payroll.

Another reason why New Jersey local governments depend heavily on local property taxes is that New Jersey local governments are more reliant on own-source revenues compared to the average local government in the country. For example, in FY 2017, 72.9% of total local government revenues in New Jersey came from own-source revenues compared to 56.3% for the average local government in all other states. This was mostly due to New Jersey municipalities receiving relatively less intergovernmental transfers.

2.3. Theoretical Framework

The current study serves primarily as an exploratory analysis to measure changes in municipality fiscal outcomes during the COVID-19 pandemic. Due to data availability challenges, this study's findings can only tell us about the short-term changes in fiscal outcomes because we only have data up to the 2020-21 fiscal year. Additionally, there has been extraordinary external policy interventions (e.g., direct federal funding to subnational governments, private businesses, and households), which are likely to end soon, which might change the long-term impact of the pandemic on local governments' fiscal outcomes. With all of that in mind, this study incorporates prior theoretical frameworks and prior empirical findings to

develop the logic behind why we might expect differential short-term changes in fiscal outcomes during the pandemic by municipality socioeconomic status.

There has been a growing body of research examining the link between local government socioeconomic status and local government fiscal outcomes (Jimenez, 2014; Warner et al., 2021). A local government's socioeconomic status is a measure of its residents' overall educational attainment, employment status, income/wealth, and poverty status. Socioeconomic status is connected to local fiscal outcomes because the overall socioeconomic status in an area impacts the local tax base and the demand for local government services (Warner et al., 2021). In fact, prior research finds that local governments that have lower levels of socioeconomic status are more likely to perceive fiscal stress compared to more affluent local governments (Warner et al., 2021).

The prediction that periods of fiscal stress tend to have the largest impact on the least affluent local governments is intuitive. The least affluent local governments exist in an economic environment with higher levels of unemployment, lower property values, lower levels of physical infrastructure, and more demand for public assistance during fiscal stress (Reese et al., 2014; Warner et al., 2021). Therefore, based on the pragmatic municipalism view, the expected fiscal policy response during a period of fiscal stress is to make spending cuts and defer needed additional spending, especially for the least affluent local governments (Warner et al., 2021).

Intergovernmental aid is a potential mitigating factor that might decrease the likelihood of spending cuts and deferrals during a period of fiscal stress. Intergovernmental aid is an important resource for local governments that are restricted to only one source of local revenue (e.g., property tax) and have low property tax bases. This is one of the reasons why state governments have served in the past as the "entity of last resort" for local governments by

providing both emergency and non-emergency state aid to local governments, especially those with the least affluent residents (Warner et al., 2021). Additionally, the federal government played a similar role in the past (e.g., the Great Recession) by providing emergency federal funding to subnational governments (Lopez-Santana & Rocco, 2021).

However, not all periods of fiscal stress can be alleviated by inflows of intergovernmental aid. Economic and health crises that cause worker shortages might be very challenging to solve through increasing revenue and expenditures. As mentioned above, the COVID-19 pandemic caused a sudden health shock to the labor market, which may have displaced workers in particular government departments like public safety and public health. Therefore, the public health concerns caused by the pandemic may have impacted local governments' abilities and costs of maintaining sufficient employees in public safety positions.

Both the economic and health crises caused by the COVID-19 pandemic are potential sources of fiscal stress for all New Jersey municipalities. However, it is unclear to what extent the COVID-19 pandemic affected fiscal outcomes and public employment across New Jersey municipalities. The lessons offered by prior theory and empirical work summarized above suggest that municipalities located in the lowest socioeconomic areas are expected to be the most negatively impacted by the COVID-19 pandemic's economic and health shocks. At the same time, additional intergovernmental aid may have buffered municipalities from having to cut spending or defer needed and unexpected spending needs. Prior research suggests that intergovernmental aid would be targeted primarily to municipalities located in the lowest socioeconomic areas because they lack the abilities to raise own-source revenues. Lastly, it is unclear if additional intergovernmental aid could mitigate the health shock of the pandemic, which might have reduced the abilities of local governments in retaining employees in public

safety and public health positions. This study will empirically test this theoretical framework using data on New Jersey municipalities.

3.   Data

We address our three research questions by compiling a panel dataset of 532 unique New Jersey municipalities between the 2014-15 fiscal year and the 2020-21 fiscal years. This represents more than 94% of all municipalities in the state. The New Jersey Department of Community Affairs publishes data on municipalities' fiscal characteristics including revenue sources, expenditures by service type, and number of employees by service type. Specifically, our outcomes of interest include total revenues, revenues from state aid, revenues from construction code fees, revenues from all other sources, total expenditures, expenditures on public safety, expenditures on all other services, total full-time and part-time employees, total full-time public safety employees, and total part-time public safety employees.

We collect data on a set of control variables that likely explain differences between poor and non-poor municipalities' fiscal decisions during periods of fiscal stress. Specifically, we use a similar theoretical framework for selecting control variables as used in Jimenez (2014), which is a study that explores how interjurisdictional competition affects the fiscal decisions between poor and affluent local governments. Therefore, the study's regression models will control for differences in socioeconomic characteristics, political ideology, demographic factors, reliance on intergovernmental aid, and other municipality-specific factors.

Higher income and wealth are expected to increase the demand for many types of local government services (Borcherding & Deacon, 1972). To proxy for the overall socioeconomic status of a municipality, we collect data on the Municipality Revitalization Index (MRI) for all New Jersey municipalities in 2021 from the New Jersey Department of Community Affairs. The

MRI combines various poverty, education, and economic variables into one index to measure the overall socioeconomic status of a local government. A higher MRI score implies that the municipality has a higher socioeconomic status. We use the MRI index to categorize N.J. municipalities into three separate SES groups: below 20th percentile in MRI (i.e., Lowest SES), between the 20th and 80th percentile in MRI (i.e., Moderate SES), and above the 80th percentile in MRI (i.e., Highest SES).

[Insert Table 1 about here]

As shown in Table 1, there are practical differences in the fiscal and employment outcomes across municipalities with low, moderate, and high levels of SES. For example, municipalities with moderate levels of SES tend to have lower total revenues per capita and total expenditures per capita compared to municipalities in either the lowest or highest SES groups. As expected, there is a negative relationship between revenues from state aid and SES levels. On average, the lowest, moderate, and highest SES municipalities receive about $196, $145, and $117 in state aid per capita, respectively. Similarly, there is a negative relationship between the total number of full-time and part-time municipality employees and SES level. On average, the lowest SES municipalities have approximately 255 full-time and part-time employees, whereas the highest SES municipalities tend to have only approximately 139 full-time and part-time employees. One possible explanation for this relationship between total municipality employees and SES level is that the lowest SES municipalities are more likely located in more populated areas.

There are various theoretical frameworks to explain the link between local citizen political ideology and local government fiscal decisions (e.g., Palus, 2010; Peterson, 1981; Schneider, 1989; Tiebout, 1956). Palus (2010) argues that the federal government has devolved

more responsibilities to subnational governments over the last decades, and this has increased the need for local governments to match local government policies to their citizens' political preferences. To proxy for the political ideology of the residents in a municipality, we collect data on the percent of residents in a municipality that voted for Presidential candidate Joseph Biden during the 2020 election. This data comes from the N.J. Department of State. As shown in Table 1, the average percent of votes for Biden in 2020 for the municipalities in the lowest SES group was approximately 57%, while the average was only approximately 47% for municipalities above the 20th percentile in the MRI index.

The demographic characteristics of a local area have important ramifications for the local tax base and the demand for local government services (Jimenez, 2014). For example, more elderly residents correspond to more demand for health-related government services, and more school-age residents may result in lower revenue collections (Jimenez, 2014). Our panel data includes demographic variables for all N.J. municipalities in our sample. As shown in Table 1, we have data on municipalities' population density, the percent of residents 65 years or older, the percent of residents under 18 years old, and the percent of residents that are non-white. This data comes from the New Jersey Data Book published by Rutgers University. There is no evidence of a practical difference in the percent of elderly residents across the sampled municipalities by SES categories. Interestingly, there are practical differences in population density across municipalities by SES categories. On average, the municipalities in the lowest SES group have 6,487 residents per square mile compared to less than 3,000 residents per square mile for municipalities with moderate and high levels of SES.

Local government fiscal decisions are also influenced by the amount of intergovernmental funding they receive (Jimenez, 2014). The flypaper effect suggests that

subnational governments tend to use intergovernmental aid to increase local spending levels

more than an equivalent increase in average citizen income (Inman, 2008). This suggests that a

higher reliance on intergovernmental aid should be positively associated with higher levels of

government spending. To control for dependency on intergovernmental aid, we create a variable

that is the ratio of the total state aid to the total amount of own-source local revenues. Own-

source local revenue includes property taxes for municipality purposes, license fees, interest,

fines, and utility operating surplus. As shown in Table 1, the average ratio of total state aid to

total own-source local revenues for the lowest SES group is 0.5 compared to 0.11 for

municipalities with the highest level of SES.

Consistent with Jimenez (2014), our study controls for local government-specific

institutional and cultural factors that are expected to influence fiscal decisions. For example,

municipalities across the state might vary in the local governance structure (e.g., mayor-council

vs. manager-council systems), government service profile, debt limit status, locale type, etc.

Given these factors tend to be fixed in the short-run, our model attempts to control for these

municipality-specific institutional and cultural factors by controlling for municipality fixed

effects. Our study assumes these factors tend to be time-invariant, especially in the short-term.

4.   Methodology

We address our research questions by estimating the differential change in fiscal

outcomes by municipality socioeconomic groups following the start of the COVID-19 pandemic.

As in prior studies examining the change in fiscal outcomes before and after the start of the

external shock, we exploit our municipality-year panel dataset to control for within-municipality

variation in fiscal and employment outcomes both for the pre-pandemic and pandemic-era fiscal

years. This strategy helps control for the unobserved municipality characteristics that are

constant across fiscal years that may influence fiscal responses to the pandemic. For example, this strategy controls for geographic proximity to major cities like New York City where the outbreak was most severe during the initial months of the COVID-19 pandemic.

We estimate the following regression model using OLS:

$$Y_{it} = \alpha + \gamma_1 Low\_SES_i \times Post_t + + \gamma_2 Mod\_SES_i \times Post_t + \beta X_{it} + \theta_i + \tau_t + \varepsilon_{it} \qquad (1)$$

where i and t index municipality and year, respectively; Y is the natural log of a fiscal outcome described in Table 1; Low_SES is a binary indicator that equals 1 if the municipality falls in the lowest socioeconomic status group with a MRI index score below the 20th percentile and 0 otherwise; Mod_SES is a binary indicator that equals 1 if the municipality falls in the moderate socioeconomic status group with a MRI index score between the 20th and 80th percentile and 0 otherwise; $Post$ is a binary indicator that equals 1 if the observation occurs in the 2019-20 fiscal year or after and 0 otherwise; X is a vector of control variables including the municipality's demographic and political characteristics; θ is a municipality fixed effect (FE); τ is a year (FE), and ε is an idiosyncratic error term. Equation (1) does not include the non-interacted versions of the two socioeconomic status indicators and the post treatment year indicator because they are absorbed in the municipality fixed effect and year fixed effect, respectively.

The differences-in-differences coefficients are γ_1 and γ_2, which estimate the differential change in fiscal outcomes following the COVID-19 pandemic by SES category. The omitted SES category is the group of municipalities with an MRI index score above the 80th percentile, which is considered the highest socioeconomic status group. Standard errors are clustered at the municipality-level, which makes inference robust to arbitrary serial correlation within municipalities.

The validity of OLS estimates of Equation (1) requires that unobserved, time-varying differences across New Jersey municipalities did not affect the fiscal decisions of the municipalities in our sample. This is an unlikely assumption because the effects of the pandemic and the responses to the pandemic by both government and non-government entities are not random. Therefore, this study makes no claim that the estimates can be given a causal interpretation. This study can only provide a descriptive analysis of the changes in the fiscal outcomes during the COVID-19 pandemic.

The post-treatment years include both the 2019-20 and 2020-21 fiscal years. The 2019-20 fiscal year is considered a post-treatment year because almost two quarters of the 2019-20 fiscal year overlap with the start of the pandemic. For example, the World Health Organization (WHO) declared a global pandemic on March 11, 2020 (CDC, 2022). Additionally, New Jersey was one of the first states affected by the pandemic with its first confirmed COVID-19 death in the state occurring on March 10, 2020 (Fallon, 2020).

5.   Results

The current study's empirical analysis examines whether there was a differential change in fiscal outcomes following the COVID-19 pandemic across the three municipality socioeconomic status groups described above in the data section. Table 2 reports the regression estimates from equation (1) for various revenue categories. All regressions control for a municipality fixed effect and a year fixed effect. The estimates reported in Column 1 of Table 2 suggest there is no statistically significant difference in the change in total revenues following the COVID-19 pandemic across the three SES groups.

[Insert Table 2 about here]

Interestingly, there are differences across the three SES groups for changes in state aid following the start of the COVID-19 pandemic. The first coefficient reported in Column 2 of Table 2 suggests that there was a 3% increase in revenues from state aid following the start of the COVID-19 pandemic for municipalities in the lowest SES group compared to municipalities in the highest SES group. Likewise, as reported in Column 2 of Table 2, there is evidence of a 2% increase in revenues from state aid following the start of the COVID-19 pandemic for municipalities in the moderate SES group compared to municipalities in the highest SES group. There is no evidence of differences in the change in revenues from construction code fees and changes in revenues from all other types of revenues following the start of the COVID-19 pandemic across the three SES groups.

One explanation for this finding is that municipalities in New Jersey rely heavily on property tax revenues, which tend to be very stable during negative economic and fiscal shocks. As illustrated earlier in Figure 1, average local property tax revenues did not decrease in New Jersey during the pandemic. Moreover, during the pandemic, the CARES Act of 2020 provided all homeowners the right to pause their mortgage payments for up to 12 months through mortgage forbearance programs. This meant that the mortgage servicers had both the responsibility and incentive to keep making property tax payments. Overall, this finding further supports the positive features of the property tax as a revenue source well equipped to better handle economic recessions than other more volatile local revenue sources.

Interestingly, there is evidence that the state government targeted less state aid to municipalities with the highest levels of SES compared to all other municipalities in the state during the pandemic years compared to the pre-pandemic years. In this study, we are not able to identify the mechanisms for why more state aid was targeted to municipalities with low and

moderate levels of SES. However, one possible mechanism is that the state government sought to provide extra funding to local governments that have less fiscal capacity to raise additional funds through higher property taxes. In other words, this finding supports the idea that the state government serves as "the entity of last resort" for the poorest municipalities.

Table 3 reports the differences-in-differences estimates from equation (1) for various spending categories. The estimates reported in Column 1 of Table 3 suggests there are no statistically significant differences in the change in total expenditures following the COVID-19 pandemic between the three SES groups. For example, we find that there was a 1% decrease in total expenditures following the start of the COVID-19 pandemic for municipalities in the lowest SES group compared to municipalities in the highest SES group. However, this coefficient is not statistically significant. Additionally, our regression results show that there was no change in total expenditures following the start of the COVID-19 pandemic for municipalities with moderate levels of SES compared to the municipalities in the highest SES group.

[Insert Table 3 about here]

One important expenditure category during the COVID-19 pandemic was spending on public safety. Public safety spending includes funding for 911 communications, police, fire, ambulance, emergency management and other public safety related costs within a municipality. Given the health and safety crisis facing all levels of government during the pandemic, we might expect a potential increase in public safety expenditures, especially in communities with lower levels of SES. Surprisingly, we find no evidence of a statistically significant change in public safety spending following the start of the COVID-19 pandemic for municipalities in the lowest SES category compared to municipalities in the highest SES category. We find a similar insignificant finding when comparing municipalities with moderate levels of SES and

municipalities with the highest levels of SES. Additionally, we find no significant differences in the change in all other expenditure categories following the pandemic by SES groups.

This study is unable to identify the specific mechanisms for why we find no differential effect of the pandemic on expenditures across municipalities with different levels of SES. However, one possible mechanism is the reliance on the property tax in New Jersey, which provides all municipalities the ability to maintain the stability of total revenues. With both a stable local revenue source via the property tax and higher levels of state aid, New Jersey municipalities in the lowest SES group were likely better able to support their public safety expenditures at a similar pace with all other municipalities in the state. Another potential mechanism is that total expenditures remained constant following the start of the pandemic because the number of local government employees decreased in the state during this time.

One hallmark of the COVID-19 pandemic is its impact on both voluntary and involuntary government employee turnover. For example, possible reasons for voluntary local government employee turnover include better job opportunities in other industries due to worker shortages, fear of personal safety due to working in close contact with others, and resistance to specific COVID-19 policies like masking and vaccinations. Therefore, it is vital to examine changes in employment in addition to spending because the pandemic likely impacted these separate outcomes differently.

[Insert Table 4 about here]

Table 4 reports the differences-in-differences estimates from equation (1) for various government employment categories. We first estimate equation (1) for total full- and part-time employees for all service types. While the magnitude of the interaction between lowest SES coefficient and the post-year indicator (-0.02) is modest in size, this coefficient is not statistically

significant. This suggests that there is no statistically significant evidence of a change in total municipality employment following the start of the COVID-19 pandemic between municipalities in the lowest SES group compared to municipalities in the highest SES group.

Interestingly, there is evidence of a larger reduction in public safety employment following the start of the COVID-19 pandemic by SES. Specifically, as reported in Column 3 of Table 4, we find a 16% larger reduction in part-time public safety employees following the start of the pandemic for municipalities in the lowest SES group compared to municipalities in the highest SES. As shown in Column 4 of Table 4, we find no evidence of a relative change in government employment for all other service types following the start of the pandemic across municipality SES groups.

These overall findings on the differential effect of the pandemic on government employment across municipality SES groups makes logical sense because public safety employees would likely be the most negatively impacted by the pandemic. Specifically, part-time public safety employees would be the hardest to recruit and retain due to their close contact with the public during the pandemic. It is possible that municipalities in the highest SES group were more successful in recruiting and retaining these employees through better compensation and better working conditions.

6.   Discussion

This exploratory study examines changes in fiscal and employment outcomes during the COVID-19 pandemic for New Jersey municipalities by socioeconomic status (SES). We report three main findings. First, this study finds no statistically significant differences in the change in local government revenues following the start of the pandemic by municipality SES group. One exception to this claim is that municipalities in the lowest SES group received a 3% higher

increase in state aid compared to municipalities in the highest SES group. The fact we do not observe a reduction in total revenues for either lower or higher SES municipalities in New Jersey can be partially explained by the high dependency on the local property tax to fund New Jersey municipalities. The stability of the local property tax might have buffered municipalities from the negative economic effects of the pandemic.

Second, we find no statistically significant differences in total expenditures following the start of the pandemic across New Jersey municipalities by SES group. This is true for all types of government services including public safety expenditures, which was arguably most directly impacted by the pandemic. Third, we find no statistically significant differences in total full-time and part-time government employment following the start of the pandemic across New Jersey municipalities by SES group. However, we find evidence of a 16% reduction in part-time public safety government employment for the lowest SES municipalities compared to the highest SES municipalities. This is not a surprising finding because part-time public safety employees would be the hardest to recruit and retain during the pandemic. One possible explanation is that working conditions for part-time government public safety employees might vary across low and high SES municipalities. Unfortunately, the current study is not able to test for possible mechanisms for why we observe this specific employment reduction.

The current study makes several contributions to the prior research on this topic. First, this study is the first to examine the New Jersey context. As explained in detail above, New Jersey is an important case study because New Jersey was one of the most negatively impacted states by the COVID-19 outbreak. Second, the study contributes to prior studies by utilizing a panel dataset with two pandemic-era fiscal years (2019-20 and 2020-21), while many prior studies can only forecast the effects on revenues and expenditures using pre-pandemic era data.

Third, this study is one of the first to measure the changes in government employment by service type, which is important because subnational government employment has yet to fully recover from the COVID-19 recession. Lastly, this study is one of the first to examine variation in local budgetary responses during the pandemic by municipality SES.

There are at least two broad policy implications based on the current study's main findings. First, consistent with prior research on this topic, our main findings suggest there are significant fiscal benefits from the local property tax during an economic crisis. Local governments that diversify their revenue structure may benefit during stable and strong economic conditions; however, a revenue structure that is less reliant on a local property tax tends to experience fiscal stress during negative changes in the economy (Chernick et al., 2020; Eason et al., 2021; Park & Pathak, 2021; Guo & Chen, 2021; Gordon et al., 2020; McDonald & Larson, 2020). For example, the nearby city of Philadelphia has experienced significant revenue shortfalls following the start of the pandemic because of their revenue structure built around a local income tax and a local sales tax (Office of the Controller, 2020). Overall, this suggests that local government stabilization funds might be needed for local governments that have a more diversified revenue structure.

A second broad policy implication of this study is how fiscal and health emergencies can impact certain types of government employment, specifically public safety employment. Our findings suggest municipalities with lower levels of socioeconomic status were more likely to experience reductions in part-time public safety employment compared to more affluent municipalities, even though the lowest SES municipalities received a relatively higher amount of state aid. Therefore, local government leaders could explore and address non-fiscal factors (e.g.,

working conditions for public safety employees) to avoid public safety staffing shortages in the future.

It is important to acknowledge potential limitations of the current study. First, we can only examine the short-term changes in the fiscal and employment outcomes for municipalities during the COVID-19 pandemic. Our data is available for only two fiscal years following the start of the COVID-19 pandemic, and the total impact of the pandemic on fiscal outcomes might take several years to show up in the data. Additionally, there has been extraordinary external policy interventions (e.g., direct federal funding to subnational governments, private businesses, and households), which are likely to end soon, which might change the long-term impact of the pandemic on local governments' fiscal outcomes. Therefore, future researchers should collect more years of data to re-examine this research question to check our results. Second, it is important for readers outside of New Jersey to avoid generalizing our main results. Our sample only includes data on municipalities in New Jersey, and it is possible that our main results are sensitive to the political and economic characteristics within New Jersey. Future researchers should test the robustness of our study's results in different contexts outside of New Jersey.

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Figure 1. Average New Jersey Municipality Revenues per Capita by Category (in 2015 dollars)
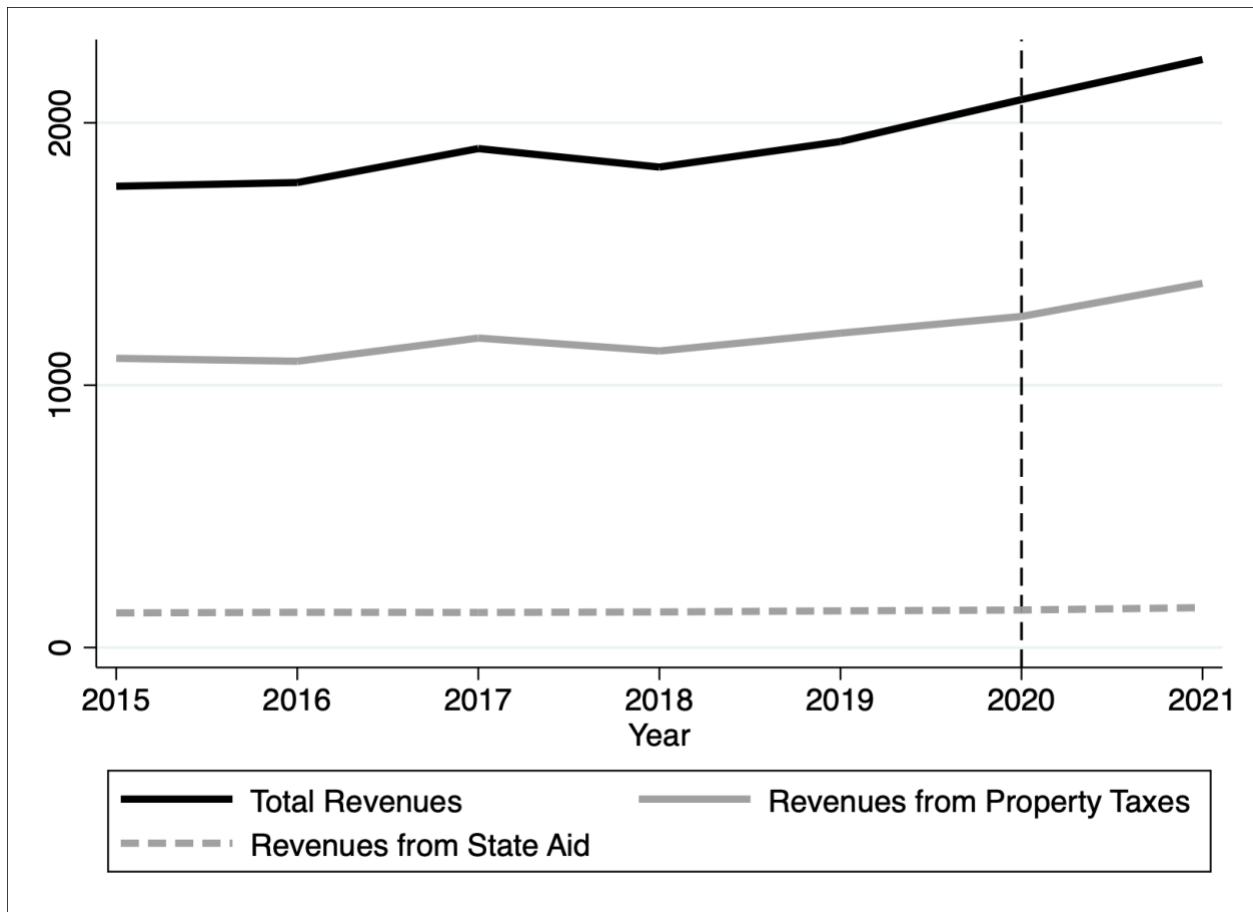
Notes: Data from the New Jersey Department of Community Affairs (NJDCA). The average values come from 532 unique municipalities in New Jersey between the 2014-15 and 2020-21 fiscal years. The first "pandemic-era" fiscal year, 2019-20 fiscal year, is denoted using the dashed vertical line. All numbers above have been put into 2015 dollars using the consumer price index.

Figure 2. Average New Jersey Municipality Expenditures per Capita by Category (in 2015 dollars)
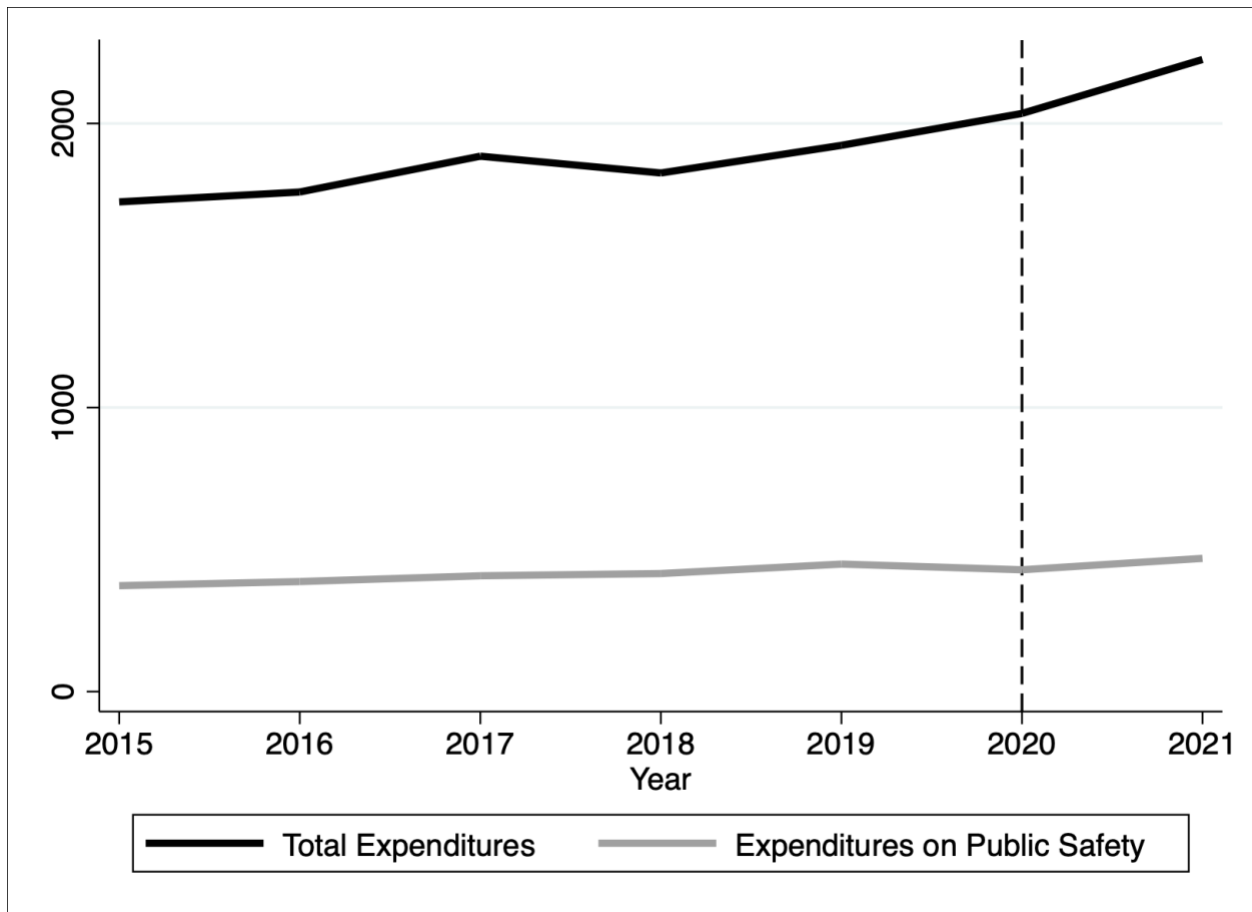
Notes: Data from the New Jersey Department of Community Affairs (NJDCA). The average values come from 532 unique municipalities in New Jersey between the 2014-15 and 2020-21 fiscal years. The first "pandemic-era" fiscal year, 2019-20 fiscal year, is denoted using the dashed vertical line. All numbers above have been put into 2015 dollars using the consumer price index.

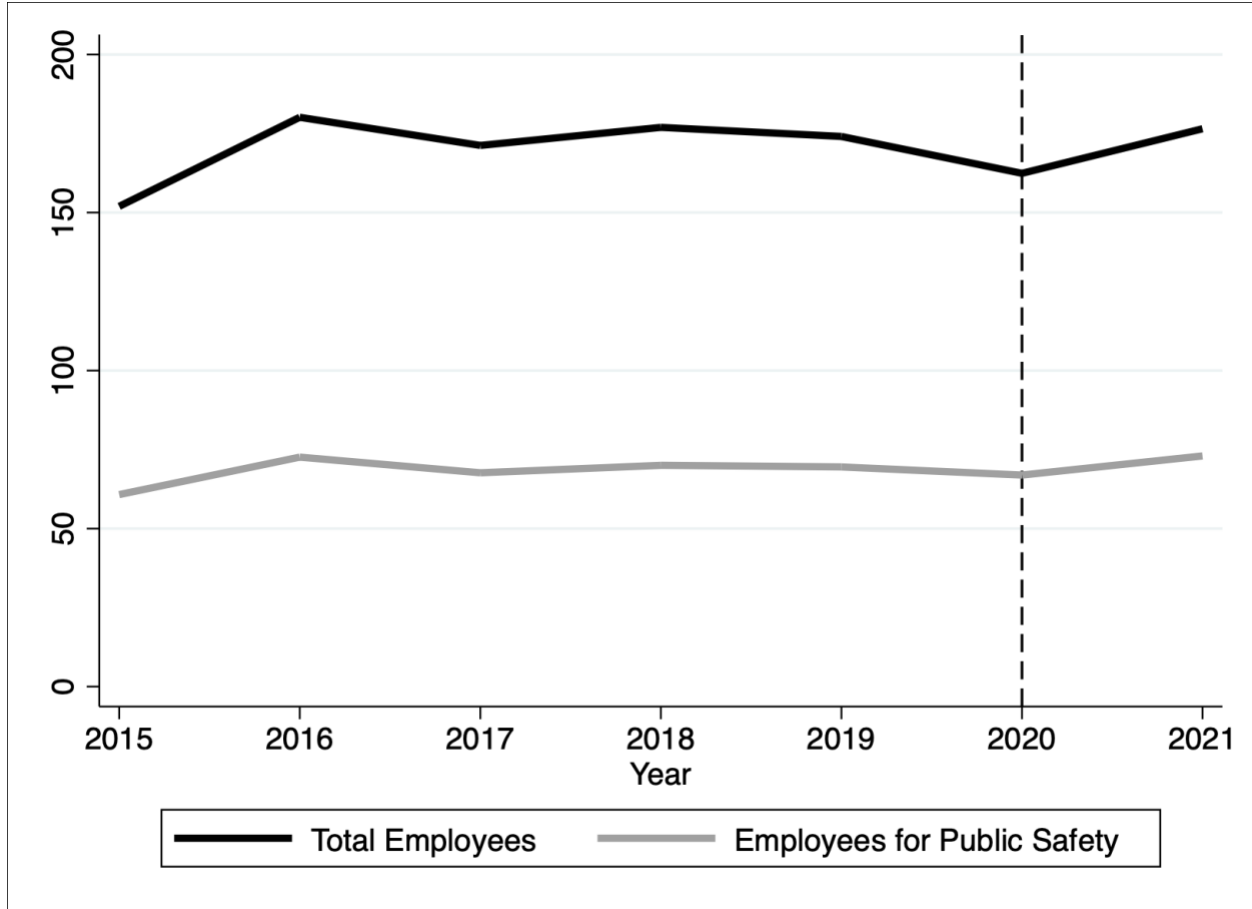**Figure 3. Average New Jersey Municipality Employment by Category**

Notes: Data from the New Jersey Department of Community Affairs (NJDCA). The average values come from 532 unique municipalities in New Jersey between the 2014-15 and 2020-21 fiscal years. The first "pandemic-era" fiscal year, 2019-20 fiscal year, is denoted using the dashed vertical line. Total employees include all full-time equivalent and part-time employees in the municipality for all government service types. Public safety employees include those working in 911 communications, police, fire, ambulance, emergency management and other public safety related services within a municipality.

Table 1. Descriptive Statistics for NJ Municipalities by Social Economic Status (SES) Category

	Lowest SES		Moderate SES		Highest SES	
	Mean	SD	Mean	SD	Mean	SD
Total revenues per capita	2,600	8,010	1,692	1,699	2,746	4,124
Total state aid per capita	196	268	145	290	117	98
Total construct code fees per capita	13	20	21	25	47	86
Total all other revenues per capita	2,391	7,842	1,526	1,576	2,583	4,002
Total expenditure per capita	2,583	8,007	1,679	1,697	2,688	4,013
Total public safety expenditure per capita	624	1,977	358	345	564	682
Total all other expenditures	1,959	6,893	1,321	1,417	2,123	3,450
Total full and part time employees	255	464	154	172	139	94
Total full-time public safety employees	94	239	41	60	30	22
Total part-time public safety employees	29	46	18	23	15	15
Total all other full and part time employees	134	223	94	107	94	75
Population density	6,487	9,596	2,993	3,903	2,003	1,885
% of Democrat voters	57	18	47	14	47	13
% of residents under 18 years old	22	6	19	4	23	6
% of residents over 65 years old	14	6	16	7	18	10
% of residents Non-White	38	24	21	15	18	12
Ratio of state aid to local revenue	0.50	3.21	0.43	3.70	0.11	.18
Municipality-Year Observations	744		2,233		745	

Notes: Fiscal, employment, socioeconomic status (SES) data come from the New Jersey Department of Community Affairs (NJDCA). Data on all other variables from the New Jersey Data Book and the New Jersey Department of State. The sample includes 532 unique municipalities in New Jersey between the 2014-15 and 2020-21 fiscal years. There was a total of 3,722 municipality-year observations.

Table 2. OLS Regression Estimates on New Jersey Municipalities' Selected Revenue Categories

	Log of Total Revenues	Log of State Aid	Log of Construct Code Fees	Log of All Other Revenues
	(1)	(2)	(3)	(4)
Lowest SES * Post	0.02	0.03**	0.08	0.02
	(0.02)	(0.01)	(0.07)	(0.02)
Moderate SES * Post	0.01	0.02**	0.04	0.01
	(0.01)	(0.01)	(0.05)	(0.01)
Population density	0.00	-0.00*	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of Democrat voters	-0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of residents under 18 years	0.00	0.00	-0.01*	0.00
	(0.00)	(0.00)	(0.01)	(0.00)
% of residents over 65 years	0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of non-white residents	-0.00**	-0.00	-0.00	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Ratio of state aid to local revenue	-0.00		0.00	-0.00
	(0.00)		(0.00)	(0.01)
Controls for:				
Municipality FEs	√	√	√	√
Year FEs	√	√	√	√
Adjusted R-squared	0.19	0.01	0.04	0.17
Observations	3,722	3,722	3,722	3,722

Notes: Clustered-robust standard errors at the municipality-level are in parentheses. The unit of analysis is the municipality-year level. The omitted SES category is the highest socioeconomic status (SES) municipalities, which have an MRI index score above the 80th percentile. The lowest SES municipalities have an MRI index score below the 20th percentile, and the moderate SES municipalities have an MRI index score between the 20th and 80th percentiles. Construction code fees are permit fees on improvements on structures in the municipalities. All other revenues is the difference between total revenues and the combination of state aid and uniform construction code fee revenues.

Table 3. OLS Regression Estimates on New Jersey Municipalities' Expenditures by Category

	Log of Total Expenditures	Log of Public Safety Expenditures	Log of All Other Expenditures
	(1)	(2)	(3)
Lowest SES * Post	-0.01	0.02	0.00
	(0.01)	(0.03)	(0.01)
Moderate SES * Post	0.00	-0.01	0.00
	(0.01)	(0.02)	(0.01)
Population density	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)
% of Democrat voters	0.00*	0.00	0.00
	(0.00)	(0.00)	(0.00)
% of residents under 18 years	0.00	0.01*	0.00**
	(0.00)	(0.00)	(0.00)
% of residents over 65 years	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)
% of non-white residents	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Ratio of state aid to local revenue	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)
Controls for:			
Municipality FEs	√	√	√
Year FEs	√	√	√
Adjusted R-squared	0.26	0.03	0.20
Observations	3,722	3,722	3,722

Notes: Clustered-robust standard errors at the municipality-level are in parentheses. The unit of analysis is the municipality-year level. The omitted SES category is the highest socioeconomic status (SES) municipalities, which have an MRI index score above the 80th percentile. The lowest SES municipalities have an MRI index score below the 20th percentile, and the moderate SES municipalities have an MRI index score between the 20th and 80th percentiles. Public safety expenditures include costs for 911 communications, police, fire, ambulance, emergency management and other public safety related services within a municipality. All other expenditures is the difference between total expenditures and expenditures on public safety.

Table 4. OLS Regression Estimates on New Jersey Municipalities' Number of Employees by Category

	Log of Total Full and Part Time Employees for All Service Types	Log of Public Safety FT Employees	Log of Public Safety PT Employees	Log of All Other Full and Part Time Employees
	(1)	(2)	(3)	(4)
Lowest SES * Post	-0.02	-0.03	-0.16***	0.01
	(0.03)	(0.03)	(0.06)	(0.04)
Moderate SES * Post	0.01	0.01	-0.06	0.02
	(0.03)	(0.01)	(0.06)	(0.03)
Population density	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of Democrat voters	0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of residents under 18 years	0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.01)	(0.00)
% of residents over 65 years	-0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
% of non-white residents	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Ratio of state aid to local revenue	0.00*	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.01)	(0.00)
Controls for:				
Municipality FEs	√	√	√	√
Year FEs	√	√	√	√
Adjusted R-squared	0.01	0.02	0.01	0.01
Observations	3,722	3,722	3,722	3,722

Notes: Clustered-robust standard errors at the municipality-level are in parentheses. The unit of analysis is the municipality-year level. The omitted SES category is the highest socioeconomic status (SES) municipalities, which have an MRI index score above the 80th percentile. The lowest SES municipalities have an MRI index score below the 20th percentile, and the moderate SES municipalities have an MRI index score between the 20th and 80th percentiles. Public safety employees include those working for 911 communications, police, fire, ambulance, emergency management and other public safety related services within a municipality. All other employees is the difference between total employees and employees for public safety.